

KALENDARZE ASTRONOMICZNE

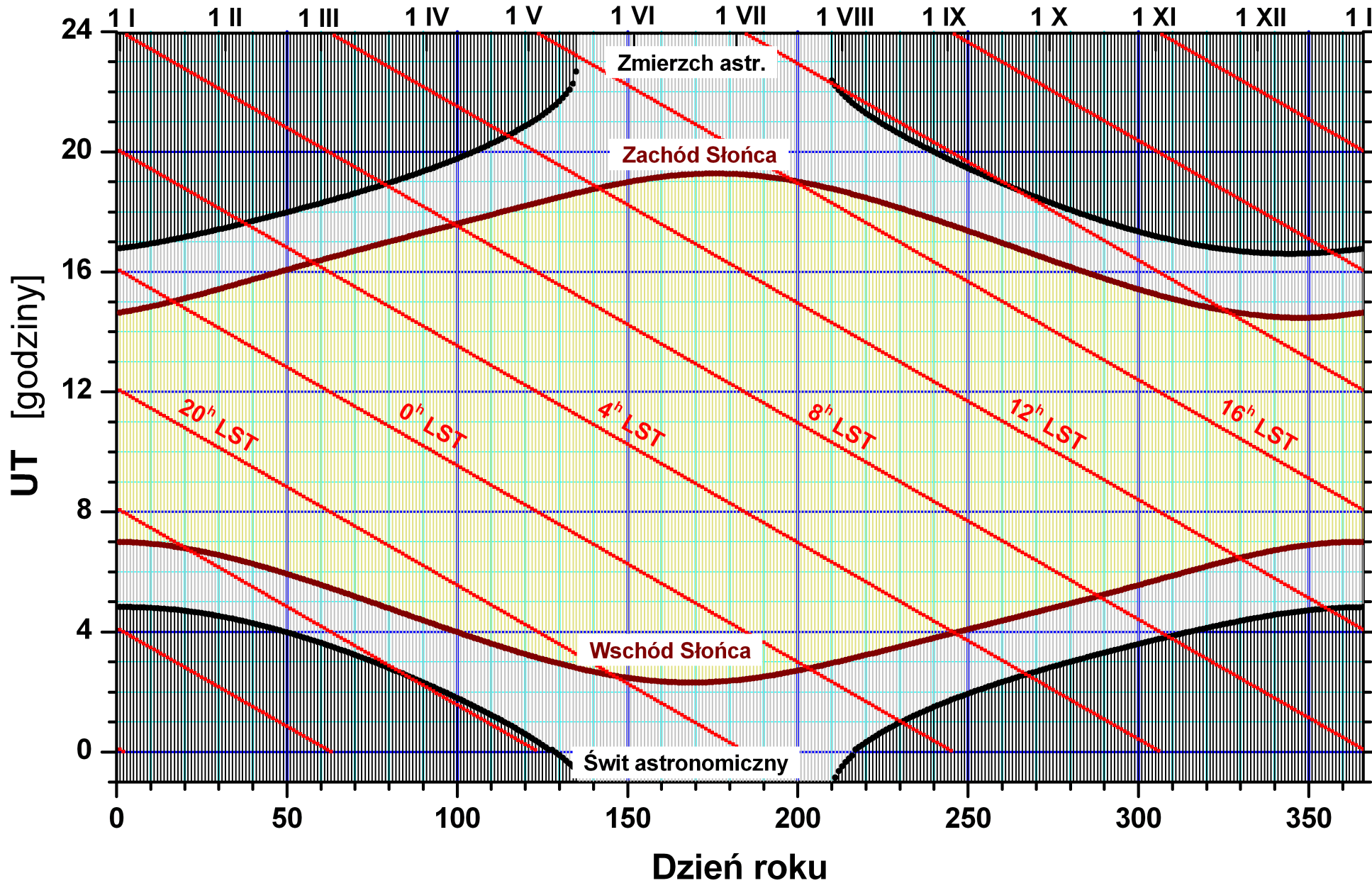
na lata 2000 – 2010

oraz tabele zjawisk na lata 2000 – 2025

Piwnice

Centrum Astronomii UMK, Toruń 2010

Świty, zmierzchy, wschody i zachody Słońca oraz *czas gwiazdowy* w Piwnicach



Kalendarz astronomiczny 2000

PIWNICE, CA UMK

Współrzędne geograficzne: 18.5641°E 53.0955°N, Nr strefy czasowej (> 0 , gdy na wschód) = 1 (CSE)

Kalendarz jest gregoriańskim i jest oparty na efemerydach Układu Słonecznego obliczanych z dokładnością 1' (Słońce 2", Księżyc 10", Pluton 15'). Czas gwiazdowy ma dokładność około 0.1 s. Wschody i zachody obliczono z uwzględnieniem horyzontalnej refrakcji astronomicznej (34'), rozciągłości Słońca lub Księżyca i paralaksy horyzontalnej Księżyca. Dla dat odległych o więcej niż ok. 300 lat od roku 1950 dokładności położenia planet są gorsze niż 1'!
(Kalendarz ten opracowano [KMB] w Katedrze Radioastronomii CA UMK, Toruń—Piwnice. Oblicz. dnia 7.10.2010 r.)

Data Wielkanocy: **2000 KWIECIEŃ 23**

Dla całego roku przyjęto: TDT – UT = 64 s

Pory roku [miesiąc dzień, godz. mm] (czas zimowy): Wiosna **III 20, 8.35**, Lato **VI 21, 2.48**, Jesień **IX 22, 18.28**, Zima **XII 21, 14.38**

Dane w czasie letnim odróżniono kolorem brązowym; czas ten obowiązuje **od 26 marca do 29 października 2000 r.**

Oznaczenia:

Dr — dzień 2000 roku (1 stycznia Dr = 1)

Dm — dzień miesiąca

Dt — dzień tygodnia

JD — data juliańska modulo 1000 o 12^h UT

(po nagłówku: Entier(JD/1000) dla Dm = 1)

ST — prawdziwy czas gwiazdowy

$\Delta\alpha$ — różnica czasu (czas słoneczny prawdziwy minus średni)

α — rektascensja (Słońca lub Księżyca)

δ — deklinacja (Słońca lub Księżyca)

R — odległość (Słońca lub Księżyca)

j_{astr} — jednostka astronomiczna

ρ_{\oplus} — promień Ziemi

Faza \leftarrow dni po kwadrze i % oświetlonej części tarczy Księżyca

Wsch — wschód (Słońca, Księżyca lub planety)

Gór — górowanie czyli tranzyt (Gal. = centrum Galaktyki)

Zach — zachód (Słońca, Księżyca lub planety)

STYCZEŃ 2000

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]									
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°/′	j astr	h.mmss	°/′	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2451																			
1	1	Sob	545	18.55550	-3.14	18.4456	-23.02	0.98333	14.4751	-10.45	63.080	2.9	23	800	1149.0	1538	226	744.4	1254	1050	1	
2	2	Nie	546	18.59516	-3.42	18.4920	-22.57	0.98332	15.3435	-14.12	63.441	3.9	16	800	1149.4	1539	332	828.4	1317	1046	2	
3	3	Pon	547	19.03482	-4.10	18.5345	-22.52	0.98332	16.2219	-17.04	63.650	4.9	9	759	1149.9	1541	437	913.4	1343	1042	3	
4	4	Wto	548	19.07447	-4.38	18.5809	-22.46	0.98332	17.1113	-19.13	63.720	5.9	5	759	1150.4	1542	540	959.7	1415	1038	4	
5	5	Śro	549	19.11413	-5.05	19.0233	-22.40	0.98333	18.0114	-20.32	63.670	6.9	2	759	1150.8	1543	638	1047.2	1454	1034	5	
6	6	Czw	550	19.15379	-5.32	19.0657	-22.33	0.98334	18.5202	-20.57	63.515	7.9	0	759	1151.3	1544	731	1135.5	1540	1030	6	
7	7	Pią	551	19.19344	-5.58	19.1120	-22.26	0.98336	19.4308	-20.26	63.270	0.7	0	758	1151.7	1546	817	1224.5	1634	1026	7	
8	8	Sob	552	19.23310	-6.24	19.1542	-22.18	0.98337	20.3402	-18.58	62.942	1.7	3	758	1152.1	1547	856	1312.9	1735	1022	8	
9	9	Nie	553	19.27275	-6.50	19.2004	-22.10	0.98340	21.2418	-16.38	62.533	2.7	7	757	1152.6	1548	928	1400.7	1840	1018	9	
10	10	Pon	554	19.31241	-7.15	19.2426	-22.01	0.98342	22.1348	-13.32	62.043	3.7	12	756	1153.0	1550	956	1447.7	1948	1015	10	
11	11	Wto	555	19.35206	-7.39	19.2846	-21.52	0.98345	23.0237	-9.46	61.470	4.7	20	756	1153.4	1551	1019	1533.9	2059	1011	11	
12	12	Śro	556	19.39172	-8.03	19.3307	-21.43	0.98349	23.5110	-5.31	60.818	5.7	28	755	1153.8	1553	1041	1620.0	2211	1007	12	
13	13	Czw	557	19.43137	-8.26	19.3726	-21.33	0.98353	0.4001	-0.55	60.095	6.7	38	754	1154.2	1554	1102	1706.5	2325	1003	13	
14	14	Pią	558	19.47103	-8.48	19.4145	-21.23	0.98357	1.2956	3.50	59.322	7.7	49	754	1154.5	1556	1123	1754.4	****	959	14	
15	15	Sob	559	19.51068	-9.10	19.4604	-21.12	0.98362	2.2145	8.31	58.535	0.9	60	753	1154.9	1558	1145	1844.6	041	955	15	
16	16	Nie	560	19.55034	-9.31	19.5021	-21.01	0.98367	3.1616	12.52	57.784	1.9	71	752	1155.3	1559	1212	1938.0	159	951	16	
17	17	Pon	561	19.58599	-9.51	19.5438	-20.50	0.98373	4.1401	16.35	57.130	2.9	81	751	1155.6	1601	1244	2035.1	320	947	17	
18	18	Wto	562	20.02565	-10.11	19.5855	-20.38	0.98380	5.1504	19.19	56.641	3.9	89	750	1155.9	1603	1325	2135.8	440	943	18	
19	19	Śro	563	20.06531	-10.30	20.0310	-20.26	0.98387	6.1838	20.46	56.376	4.9	96	749	1156.2	1604	1417	2238.6	555	939	19	
20	20	Czw	564	20.10497	-10.48	20.0725	-20.13	0.98395	7.2311	20.44	56.379	5.9	99	748	1156.6	1606	1522	2341.7	700	935	20	
21	21	Pią	565	20.14462	-11.06	20.1139	-19.60	0.98404	8.2648	19.14	56.664	0.3	100	746	1156.8	1608	1637	*****	754	931	21	
22	22	Sob	566	20.18428	-11.23	20.1552	-19.47	0.98413	9.2751	16.26	57.212	1.3	98	745	1157.1	1610	1757	042.7	835	927	22	
23	23	Nie	567	20.22393	-11.39	20.2005	-19.33	0.98422	10.2531	12.41	57.974	2.3	93	744	1157.4	1611	1917	140.2	908	923	23	
24	24	Pon	568	20.26359	-11.54	20.2417	-19.19	0.98433	11.1941	8.20	58.881	3.3	86	743	1157.6	1613	2035	233.7	935	920	24	
25	25	Wto	569	20.30324	-12.08	20.2828	-19.04	0.98444	12.1051	3.41	59.851	4.3	78	741	1157.9	1615	2150	323.7	957	916	25	
26	26	Śro	570	20.34290	-12.22	20.3238	-18.49	0.98455	12.5946	-0.58	60.808	5.3	68	740	1158.1	1617	2303	410.8	1018	912	26	
27	27	Czw	571	20.38255	-12.35	20.3647	-18.34	0.98467	13.4717	-5.26	61.681	6.3	59	738	1158.3	1619	****	456.2	1038	908	27	
28	28	Pią	572	20.42221	-12.47	20.4056	-18.19	0.98480	14.3412	-9.34	62.420	0.1	49	737	1158.5	1621	012	540.6	1058	904	28	
29	29	Sob	573	20.46186	-12.58	20.4504	-18.03	0.98493	15.2112	-13.14	62.989	1.1	39	735	1158.7	1623	120	624.9	1121	900	29	
30	30	Nie	574	20.50152	-13.09	20.4911	-17.47	0.98506	16.0849	-16.18	63.370	2.1	30	734	1158.9	1624	226	709.7	1146	856	30	
31	31	Pon	575	20.54117	-13.18	20.5317	-17.30	0.98520	16.5724	-18.40	63.563	3.1	22	732	1159.1	1626	330	755.6	1216	852	31	

Fazy Księżyca [Dm, h.mm]: Nów 6, 19.14 1kw 14, 14.34 Pełn 21, 5.40 3kw 28, 8.57

STYCZEŃ 2000 (c.d.)

Świty, zmiernicy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	Dm
1	5.51	17.48	7.37	14.49	4.46	13.23	10.16	19.57	11.50	1.32	12.26	2.55	9.47	18.41	9.13	17.39	4.49	14.52		
	18.749	-23.04	18.134	-24.42	15.990	-18.44	22.033	-13.19	1.592	8.60	2.584	12.61	21.165	-17.02	20.364	-19.21	16.757	-11.30	6.66428	1
3	5.51	17.50	7.44	14.54	4.52	13.21	10.10	19.58	11.42	1.25	12.18	2.47	9.39	18.34	9.05	17.32	4.41	14.44		
	18.896	-22.86	18.363	-24.52	16.156	-18.96	22.132	-12.63	1.597	8.64	2.582	12.61	21.172	-16.99	20.369	-19.19	16.761	-11.30	6.79570	3
5	5.51	17.52	7.50	14.59	4.57	13.20	10.05	19.59	11.34	1.18	12.10	2.39	9.31	18.27	8.58	17.24	4.34	14.37		
	19.043	-22.66	18.594	-24.54	16.323	-19.45	22.230	-12.06	1.603	8.69	2.579	12.61	21.179	-16.96	20.373	-19.18	16.766	-11.31	6.92713	5
7	5.51	17.54	7.55	15.06	5.02	13.19	9.60	20.01	11.26	1.10	12.02	2.31	9.24	18.20	8.50	17.17	4.26	14.29		
	19.189	-22.43	18.826	-24.47	16.492	-19.91	22.328	-11.48	1.610	8.74	2.578	12.61	21.186	-16.93	20.379	-19.16	16.770	-11.31	7.05855	7
9	5.50	17.56	8.00	15.13	5.08	13.19	9.54	20.02	11.19	1.03	11.54	2.23	9.16	18.12	8.42	17.10	4.19	14.21		
	19.334	-22.16	19.060	-24.30	16.662	-20.33	22.426	-10.89	1.618	8.79	2.577	12.62	21.193	-16.90	20.384	-19.14	16.775	-11.32	7.18997	9
11	5.50	17.59	8.04	15.22	5.13	13.19	9.49	20.03	11.11	0.56	11.46	2.15	9.09	18.05	8.35	17.02	4.11	14.14		
	19.480	-21.87	19.295	-24.04	16.833	-20.72	22.523	-10.30	1.626	8.85	2.576	12.63	21.200	-16.86	20.389	-19.13	16.779	-11.32	7.32139	11
13	5.49	18.01	8.08	15.31	5.18	13.19	9.44	20.04	11.03	0.49	11.38	2.07	9.01	17.58	8.27	16.55	4.03	14.06		
	19.624	-21.55	19.531	-23.68	17.006	-21.07	22.620	-9.70	1.636	8.92	2.576	12.64	21.207	-16.83	20.394	-19.11	16.783	-11.32	7.45281	13
15	5.48	18.04	8.10	15.40	5.22	13.19	9.38	20.06	10.56	0.43	11.30	1.59	8.53	17.51	8.19	16.47	3.56	13.58		
	19.768	-21.20	19.767	-23.21	17.179	-21.38	22.716	-9.10	1.646	8.99	2.576	12.65	21.215	-16.80	20.399	-19.09	16.788	-11.32	7.58422	15
17	5.46	18.06	8.12	15.51	5.27	13.20	9.33	20.07	10.48	0.36	11.23	1.52	8.46	17.44	8.12	16.40	3.48	13.51		
	19.911	-20.83	20.003	-22.65	17.353	-21.65	22.812	-8.49	1.657	9.06	2.577	12.66	21.222	-16.76	20.404	-19.07	16.792	-11.33	7.71565	17
19	5.45	18.09	8.14	16.02	5.31	13.20	9.27	20.08	10.41	0.29	11.15	1.44	8.38	17.36	8.04	16.32	3.41	13.43		
	20.053	-20.43	20.240	-21.99	17.528	-21.89	22.908	-7.88	1.668	9.14	2.579	12.68	21.229	-16.73	20.409	-19.06	16.796	-11.33	7.84707	19
21	5.43	18.12	8.15	16.14	5.35	13.22	9.22	20.09	10.33	0.22	11.07	1.36	8.30	17.29	7.56	16.25	3.33	13.36		
	20.194	-20.00	20.476	-21.22	17.703	-22.07	23.003	-7.27	1.681	9.22	2.580	12.70	21.237	-16.70	20.415	-19.04	16.800	-11.33	7.97849	21
23	5.41	18.15	8.15	16.26	5.39	13.23	9.16	20.11	10.25	0.16	10.59	1.29	8.23	17.22	7.49	16.17	3.25	13.28		
	20.335	-19.55	20.712	-20.35	17.879	-22.22	23.098	-6.65	1.694	9.30	2.583	12.72	21.244	-16.66	20.420	-19.02	16.803	-11.33	8.10991	23
25	5.39	18.18	8.15	16.39	5.42	13.25	9.10	20.12	10.18	0.09	10.51	1.21	8.15	17.15	7.41	16.10	3.18	13.20		
	20.474	-19.07	20.946	-19.38	18.056	-22.33	23.193	-6.02	1.708	9.39	2.585	12.74	21.252	-16.63	20.425	-19.00	16.807	-11.33	8.24133	25
27	5.37	18.21	8.14	16.52	5.45	13.28	9.05	20.13	10.10	0.03	10.43	1.13	8.08	17.08	7.33	16.03	3.10	13.13		
	20.613	-18.57	21.179	-18.30	18.233	-22.39	23.287	-5.40	1.722	9.48	2.589	12.77	21.260	-16.59	20.430	-18.99	16.810	-11.33	8.37275	27
29	5.35	18.24	8.12	17.05	5.48	13.30	8.59	20.14	10.03	23.52	10.35	1.06	7.60	17.00	7.26	15.55	3.02	13.05		
	20.751	-18.05	21.409	-17.13	18.410	-22.40	23.381	-4.77	1.738	9.58	2.592	12.80	21.267	-16.56	20.435	-18.97	16.814	-11.33	8.50416	29
31	5.32	18.27	8.10	17.19	5.51	13.33	8.54	20.15	9.55	23.46	10.28	0.59	7.52	16.53	7.18	15.48	2.55	12.57		
	20.888	-17.50	21.636	-15.87	18.588	-22.37	23.475	-4.14	1.753	9.68	2.597	12.83	21.275	-16.52	20.441	-18.95	16.817	-11.33	8.63559	31

LUTY 2000

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)											Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ		Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2451																			
32	1	Wto	576	20.58083	-13.27	20.5723	-17.14	0.98534	17.4703	-20.14	63.580	4.1	15	731	1159.2	1628	430	842.6	1252	848	1	
33	2	Śro	577	21.02049	-13.36	21.0127	-16.56	0.98549	18.3738	-20.55	63.443	5.1	9	729	1159.3	1630	525	930.7	1335	844	2	
34	3	Czw	578	21.06014	-13.43	21.0531	-16.39	0.98564	19.2848	-20.40	63.180	6.1	4	727	1159.5	1632	614	1019.5	1427	840	3	
35	4	Pią	579	21.09580	-13.49	21.0934	-16.21	0.98579	20.2004	-19.27	62.819	7.1	1	726	1159.6	1634	655	1108.4	1526	836	4	
36	5	Sob	580	21.13545	-13.55	21.1336	-16.03	0.98594	21.1059	-17.20	62.390	8.1	0	724	1159.7	1636	730	1157.0	1630	832	5	
37	6	Nie	581	21.17511	-13.60	21.1738	-15.45	0.98610	22.0116	-14.23	61.915	0.9	1	722	1159.7	1638	800	1244.9	1738	828	6	
38	7	Pon	582	21.21476	-14.04	21.2139	-15.27	0.98626	22.5050	-10.43	61.411	1.9	4	720	1159.8	1640	825	1331.9	1849	824	7	
39	8	Wto	583	21.25442	-14.07	21.2538	-15.08	0.98642	23.3952	-6.31	60.889	2.9	8	719	1159.9	1642	847	1418.5	2001	821	8	
40	9	Śro	584	21.29407	-14.10	21.2937	-14.49	0.98659	0.2850	-1.58	60.353	3.9	15	717	1159.9	1644	908	1505.0	2115	817	9	
41	10	Czw	585	21.33373	-14.11	21.3336	-14.30	0.98676	1.1818	2.46	59.808	4.9	24	715	1159.9	1646	929	1552.1	2230	813	10	
42	11	Pią	586	21.37338	-14.12	21.3733	-14.10	0.98693	2.0860	7.26	59.260	5.9	33	713	1159.9	1648	950	1640.8	2346	809	11	
43	12	Sob	587	21.41304	-14.12	21.4130	-13.50	0.98711	3.0139	11.49	58.718	6.9	44	711	1159.9	1650	1015	1731.7	****	805	12	
44	13	Nie	588	21.45270	-14.11	21.4525	-13.30	0.98729	3.5651	15.38	58.206	0.5	55	709	1159.9	1652	1043	1825.6	104	801	13	
45	14	Pon	589	21.49235	-14.10	21.4921	-13.10	0.98747	4.5452	18.36	57.753	1.5	67	707	1159.9	1654	1119	1922.7	222	757	14	
46	15	Wto	590	21.53201	-14.08	21.5315	-12.50	0.98766	5.5527	20.26	57.400	2.5	77	705	1159.9	1656	1205	2022.4	336	753	15	
47	16	Śro	591	21.57166	-14.05	21.5708	-12.29	0.98786	6.5741	20.57	57.189	3.5	86	703	1159.8	1658	1302	2123.4	444	749	16	
48	17	Czw	592	22.01132	-14.01	22.0101	-12.08	0.98805	8.0009	20.03	57.160	4.5	93	701	1159.8	1700	1410	2224.0	541	745	17	
49	18	Pią	593	22.05097	-13.57	22.0453	-11.47	0.98826	9.0119	17.49	57.339	5.5	98	659	1159.7	1701	1527	2322.5	627	741	18	
50	19	Sob	594	22.09063	-13.52	22.0845	-11.26	0.98846	10.0004	14.27	57.732	6.5	100	657	1159.6	1703	1647	*****	704	737	19	
51	20	Nie	595	22.13029	-13.46	22.1236	-11.05	0.98868	10.5556	10.18	58.319	0.8	99	655	1159.5	1705	1807	018.0	733	733	20	
52	21	Pon	596	22.16594	-13.39	22.1626	-10.43	0.98889	11.4901	5.40	59.059	1.8	96	652	1159.4	1707	1925	110.2	758	729	21	
53	22	Wto	597	22.20560	-13.32	22.2015	-10.22	0.98912	12.3946	0.53	59.893	2.8	91	650	1159.3	1709	2041	159.6	820	725	22	
54	23	Śro	598	22.24525	-13.24	22.2404	-9.60	0.98934	13.2852	-3.49	60.753	3.8	84	648	1159.2	1711	2154	246.8	840	722	23	
55	24	Czw	599	22.28490	-13.16	22.2752	-9.38	0.98957	14.1702	-8.12	61.572	4.8	75	646	1159.0	1713	2304	332.7	901	718	24	
56	25	Pią	600	22.32456	-13.07	22.3140	-9.15	0.98981	15.0453	-12.07	62.289	5.8	66	644	1158.9	1715	****	418.1	922	714	25	
57	26	Sob	601	22.36422	-12.58	22.3527	-8.53	0.99004	15.5259	-15.27	62.856	6.8	57	641	1158.7	1717	012	503.5	947	710	26	
58	27	Nie	602	22.40387	-12.48	22.3913	-8.31	0.99029	16.4142	-18.05	63.239	0.3	47	639	1158.5	1719	118	549.5	1015	706	27	
59	28	Pon	603	22.44353	-12.37	22.4259	-8.08	0.99053	17.3113	-19.55	63.422	1.3	38	637	1158.4	1721	220	636.3	1049	702	28	
60	29	Wto	604	22.48318	-12.26	22.4645	-7.45	0.99078	18.2132	-20.53	63.404	2.3	29	635	1158.2	1723	317	724.1	1129	658	29	

Fazy Księżyca [Dm, h.mm]: Nów 5, 14.03 1kw 13, 0.21 Pełn 19, 17.27 3kw 27, 4.53

LUTY 2000 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST (0 ^h UT) Dm	
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach		
1	5.31	18.29	8.09	17.26	5.52	13.35	8.51	20.16	9.52	23.43	10.24	0.55	7.48	16.50	7.14	15.44	2.51	12.53		
	20.956	-17.23	21.748	-15.21	18.676	-22.34	23.522	-3.83	1.762	9.73	2.599	12.84	21.279	-16.51	20.443	-18.94	16.819	-11.33	8.70130	1
3	5.28	18.32	8.06	17.39	5.54	13.38	8.45	20.17	9.44	23.37	10.16	0.48	7.41	16.42	7.06	15.37	2.43	12.46		
	21.092	-16.65	21.967	-13.83	18.854	-22.25	23.615	-3.20	1.778	9.83	2.604	12.88	21.287	-16.47	20.448	-18.93	16.822	-11.32	8.83272	3
5	5.26	18.36	8.02	17.52	5.56	13.42	8.40	20.18	9.37	23.30	10.08	0.40	7.33	16.35	6.59	15.29	2.35	12.38		
	21.227	-16.06	22.178	-12.39	19.031	-22.11	23.709	-2.57	1.796	9.94	2.609	12.91	21.294	-16.44	20.453	-18.91	16.825	-11.32	8.96414	5
7	5.23	18.39	7.58	18.05	5.57	13.46	8.34	20.19	9.29	23.24	10.01	0.33	7.26	16.28	6.51	15.22	2.28	12.30		
	21.361	-15.44	22.378	-10.90	19.208	-21.93	23.802	-1.93	1.814	10.05	2.615	12.95	21.302	-16.40	20.459	-18.89	16.828	-11.32	9.09556	7
9	5.19	18.42	7.53	18.17	5.58	13.50	8.28	20.20	9.22	23.18	9.53	0.26	7.18	16.21	6.43	15.14	2.20	12.23		
	21.494	-14.81	22.566	-9.41	19.384	-21.70	23.895	-1.30	1.833	10.16	2.621	12.99	21.310	-16.37	20.464	-18.87	16.830	-11.31	9.22697	9
11	5.16	18.46	7.47	18.27	5.59	13.55	8.23	20.21	9.15	23.12	9.45	0.18	7.10	16.14	6.36	15.07	2.12	12.15		
	21.626	-14.17	22.735	-7.94	19.560	-21.43	23.987	-0.67	1.852	10.28	2.628	13.03	21.317	-16.33	20.469	-18.86	16.833	-11.31	9.35839	11
13	5.13	18.49	7.40	18.36	5.59	13.60	8.17	20.22	9.07	23.06	9.37	0.11	7.03	16.06	6.28	14.59	2.05	12.07		
	21.757	-13.51	22.882	-6.53	19.735	-21.12	0.080	-0.04	1.872	10.40	2.635	13.07	21.325	-16.30	20.474	-18.84	16.835	-11.31	9.48981	13
15	5.09	18.53	7.32	18.42	5.59	14.05	8.11	20.23	8.60	23.00	9.30	0.04	6.55	15.59	6.20	14.52	1.57	11.60		
	21.887	-12.83	23.001	-5.25	19.909	-20.77	0.173	0.59	1.892	10.52	2.643	13.12	21.333	-16.26	20.479	-18.82	16.838	-11.30	9.62123	15
17	5.05	18.56	7.24	18.45	5.59	14.10	8.06	20.24	8.53	22.54	9.22	23.53	6.48	15.52	6.13	14.44	1.49	11.52		
	22.017	-12.14	23.087	-4.15	20.083	-20.37	0.265	1.22	1.913	10.64	2.650	13.17	21.340	-16.23	20.483	-18.80	16.840	-11.30	9.75266	17
19	5.01	18.60	7.14	18.45	5.59	14.15	7.60	20.25	8.45	22.48	9.14	23.46	6.40	15.45	6.05	14.37	1.41	11.44		
	22.146	-11.44	23.137	-3.27	20.256	-19.94	0.357	1.84	1.935	10.77	2.659	13.21	21.348	-16.19	20.488	-18.79	16.842	-11.29	9.88407	19
21	4.57	19.04	7.04	18.41	5.58	14.21	7.54	20.26	8.38	22.43	9.07	23.39	6.32	15.38	5.57	14.29	1.34	11.37		
	22.274	-10.72	23.146	-2.68	20.427	-19.47	0.449	2.47	1.956	10.89	2.668	13.27	21.355	-16.16	20.493	-18.77	16.844	-11.28	10.01549	21
23	4.53	19.07	6.52	18.32	5.57	14.27	7.49	20.27	8.31	22.37	8.59	23.32	6.25	15.30	5.50	14.22	1.26	11.29		
	22.401	-9.99	23.115	-2.40	20.598	-18.96	0.541	3.09	1.979	11.02	2.677	13.32	21.363	-16.12	20.498	-18.75	16.846	-11.28	10.14690	23
25	4.49	19.11	6.41	18.20	5.56	14.33	7.43	20.28	8.24	22.31	8.52	23.25	6.17	15.23	5.42	14.15	1.18	11.21		
	22.528	-9.26	23.048	-2.44	20.768	-18.41	0.633	3.70	2.002	11.15	2.686	13.37	21.370	-16.09	20.502	-18.74	16.847	-11.27	10.27832	25
27	4.45	19.15	6.29	18.05	5.54	14.39	7.37	20.29	8.16	22.25	8.44	23.18	6.09	15.16	5.34	14.07	1.10	11.13		
	22.654	-8.51	22.950	-2.80	20.936	-17.82	0.726	4.32	2.025	11.29	2.696	13.42	21.378	-16.06	20.507	-18.72	16.849	-11.26	10.40974	27
29	4.40	19.18	6.17	17.46	5.52	14.45	7.32	20.30	8.09	22.20	8.36	23.11	6.02	15.09	5.27	13.60	1.02	11.06		
	22.779	-7.76	22.832	-3.43	21.103	-17.21	0.818	4.93	2.049	11.42	2.707	13.48	21.385	-16.02	20.511	-18.71	16.850	-11.26	10.54116	29

MARZEC 2000

Piwnice, CA UMK				← Dane na godz. 12 czasu strefowego (= 11 lub 10 ^h UT) →										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2451																					
61	1	Śro	605	22.52284	-12.14	22.5030	-7.23	0.99102	19.1228	-20.55	63.200	3.3	21	632	1158.0	1724	408	812.6	1217	654	1
62	2	Czw	606	22.56249	-12.02	22.5414	-6.60	0.99127	20.0339	-19.60	62.839	4.3	14	630	1157.8	1726	453	901.4	1313	650	2
63	3	Pią	607	23.00215	-11.50	22.5758	-6.37	0.99153	20.5445	-18.08	62.356	5.3	8	628	1157.6	1728	530	950.2	1416	646	3
64	4	Sob	608	23.04180	-11.37	23.0142	-6.14	0.99178	21.4528	-15.24	61.793	6.3	3	626	1157.4	1730	601	1038.6	1524	642	4
65	5	Nie	609	23.08146	-11.23	23.0525	-5.50	0.99203	22.3543	-11.53	61.193	7.3	1	623	1157.1	1732	628	1126.4	1635	638	5
66	6	Pon	610	23.12111	-11.09	23.0908	-5.27	0.99229	23.2535	-7.45	60.596	0.2	0	621	1156.9	1734	651	1213.9	1748	634	6
67	7	Wto	611	23.16077	-10.55	23.1250	-5.04	0.99254	0.1521	-3.10	60.034	1.2	2	619	1156.7	1736	713	1301.2	1903	630	7
68	8	Śro	612	23.20042	-10.41	23.1632	-4.40	0.99280	1.0532	1.39	59.529	2.2	6	616	1156.4	1738	734	1349.0	2019	627	8
69	9	Czw	613	23.24008	-10.25	23.2013	-4.17	0.99306	1.5640	6.28	59.092	3.2	12	614	1156.2	1739	755	1437.9	2136	623	9
70	10	Pią	614	23.27573	-10.10	23.2354	-3.53	0.99332	2.4922	10.60	58.727	4.2	20	612	1155.9	1741	819	1528.7	2254	619	10
71	11	Sob	615	23.31539	-9.54	23.2735	-3.30	0.99358	3.4407	14.59	58.431	5.2	30	609	1155.7	1743	846	1621.7	****	615	11
72	12	Nie	616	23.35504	-9.38	23.3116	-3.06	0.99384	4.4109	18.10	58.201	6.2	41	607	1155.4	1745	919	1717.3	012	611	12
73	13	Pon	617	23.39470	-9.22	23.3456	-2.43	0.99410	5.4016	20.15	58.039	0.2	52	605	1155.1	1747	1000	1815.1	127	607	13
74	14	Wto	618	23.43436	-9.05	23.3836	-2.19	0.99437	6.4046	21.06	57.951	1.2	63	602	1154.8	1749	1052	1914.2	236	603	14
75	15	Śro	619	23.47401	-8.49	23.4216	-1.55	0.99463	7.4134	20.35	57.949	2.2	74	600	1154.6	1750	1155	2013.2	335	559	15
76	16	Czw	620	23.51367	-8.31	23.4555	-1.31	0.99490	8.4126	18.47	58.051	3.2	83	557	1154.3	1752	1307	2110.8	423	555	16
77	17	Pią	621	23.55332	-8.14	23.4934	-1.08	0.99517	9.3926	15.49	58.272	4.2	91	555	1154.0	1754	1424	2206.0	502	551	17
78	18	Sob	622	23.59298	-7.57	23.5313	-0.44	0.99545	10.3504	11.58	58.622	5.2	96	553	1153.7	1756	1543	2258.4	533	547	18
79	19	Nie	623	0.03263	-7.39	23.5652	-0.20	0.99572	11.2820	7.30	59.099	6.2	99	550	1153.4	1758	1701	2348.4	559	543	19
80	20	Pon	624	0.07229	-7.21	0.0031	0.03	0.99600	12.1935	2.44	59.688	0.3	100	548	1153.1	1759	1817	*****	621	539	20
81	21	Wto	625	0.11194	-7.03	0.0410	0.27	0.99628	13.0920	-2.04	60.356	1.3	98	545	1152.8	1801	1932	036.4	642	535	21
82	22	Śro	626	0.15160	-6.45	0.0748	0.51	0.99657	13.5811	-6.40	61.059	2.3	94	543	1152.5	1803	2045	123.2	702	531	22
83	23	Czw	627	0.19125	-6.27	0.1126	1.14	0.99685	14.4642	-10.52	61.746	3.3	89	541	1152.2	1805	2155	209.2	723	528	23
84	24	Pią	628	0.23091	-6.09	0.1505	1.38	0.99714	15.3521	-14.30	62.365	4.3	82	538	1151.9	1807	2303	255.3	747	524	24
85	25	Sob	629	0.27056	-5.50	0.1843	2.02	0.99743	16.2428	-17.27	62.865	5.3	73	536	1151.6	1808	****	341.7	813	520	25
86	26	Nie	630	0.31022	-5.32	0.2222	2.25	0.99772	17.1411	-19.36	63.207	6.3	65	533	1151.3	1810	008	428.8	845	516	26
86	26	Nie	630	23.30523	-5.33	0.2212	2.24	0.99771	17.1206	-19.31	63.196	6.2	65	633	1251.3	1910	108	528.8	945	616	26
87	27	Pon	631	23.34489	-5.15	0.2551	2.48	0.99800	18.0224	-20.50	63.358	7.2	56	631	1251.0	1912	208	616.5	1022	612	27
88	28	Wto	632	23.38454	-4.57	0.2929	3.11	0.99829	18.5308	-21.13	63.319	0.4	46	629	1250.7	1914	302	704.8	1107	608	28
89	29	Śro	633	23.42420	-4.39	0.3308	3.34	0.99859	19.4403	-20.39	63.078	1.4	37	626	1250.4	1916	349	753.3	1200	604	29
90	30	Czw	634	23.46385	-4.21	0.3646	3.58	0.99888	20.3453	-19.09	62.652	2.4	28	624	1250.1	1917	428	841.8	1300	600	30
91	31	Pią	635	23.50351	-4.03	0.4025	4.21	0.99917	21.2525	-16.44	62.074	3.4	20	621	1249.8	1919	502	930.0	1405	556	31

Fazy Księżyca [Dm, h.mm]: Nów 6, 6.17 1kw 13, 7.59 Pełn 20, 5.44 Pełn 20, 6.44 3kw 28, 2.21

MARZEC 2000 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.38	19.20	6.12	17.37	5.51	14.48	7.29	20.30	8.05	22.17	8.33	23.08	5.58	15.05	5.23	13.56	0.58	11.02		
	22.842	-7.38	22.769	-3.82	21.187	-16.89	0.864	5.23	2.061	11.49	2.712	13.51	21.389	-16.01	20.514	-18.70	16.850	-11.25	10.60687	1
3	4.33	19.24	6.01	17.16	5.49	14.54	7.23	20.31	7.58	22.11	8.25	23.01	5.50	14.58	5.15	13.48	0.50	10.54		
	22.966	-6.61	22.643	-4.72	21.352	-16.22	0.956	5.83	2.085	11.63	2.723	13.57	21.396	-15.97	20.518	-18.68	16.851	-11.24	10.73829	3
5	4.29	19.28	5.51	16.56	5.47	15.00	7.18	20.32	7.51	22.06	8.17	22.54	5.43	14.51	5.07	13.41	0.43	10.46		
	23.090	-5.84	22.525	-5.69	21.517	-15.53	1.048	6.43	2.110	11.77	2.734	13.63	21.403	-15.94	20.522	-18.67	16.852	-11.24	10.86971	5
7	4.24	19.32	5.43	16.37	5.44	15.06	7.12	20.33	7.44	22.00	8.10	22.47	5.35	14.44	4.60	13.33	0.35	10.38		
	23.214	-5.06	22.426	-6.65	21.680	-14.80	1.140	7.03	2.136	11.91	2.745	13.69	21.410	-15.91	20.526	-18.65	16.853	-11.23	11.00112	7
9	4.19	19.36	5.35	16.20	5.42	15.13	7.06	20.34	7.37	21.55	8.02	22.40	5.27	14.36	4.52	13.26	0.27	10.31		
	23.337	-4.28	22.351	-7.54	21.842	-14.05	1.232	7.62	2.161	12.05	2.757	13.75	21.417	-15.88	20.531	-18.64	16.854	-11.22	11.13254	9
11	4.14	19.40	5.29	16.05	5.39	15.19	7.01	20.35	7.30	21.49	7.55	22.34	5.20	14.29	4.44	13.18	0.19	10.23		
	23.460	-3.50	22.303	-8.32	22.003	-13.27	1.325	8.20	2.187	12.19	2.769	13.81	21.424	-15.85	20.535	-18.63	16.854	-11.21	11.26396	11
13	4.09	19.44	5.23	15.52	5.36	15.25	6.55	20.36	7.23	21.44	7.47	22.27	5.12	14.22	4.36	13.11	0.11	10.15		
	23.582	-2.71	22.283	-8.96	22.163	-12.47	1.417	8.77	2.214	12.33	2.782	13.88	21.430	-15.81	20.538	-18.61	16.854	-11.20	11.39538	13
15	4.04	19.48	5.19	15.42	5.33	15.32	6.50	20.37	7.15	21.38	7.40	22.20	5.04	14.14	4.29	13.03	0.03	10.07		
	23.704	-1.92	22.289	-9.44	22.322	-11.64	1.509	9.34	2.240	12.47	2.795	13.94	21.437	-15.78	20.542	-18.60	16.855	-11.19	11.52680	15
17	3.58	19.52	5.14	15.35	5.30	15.38	6.44	20.37	7.08	21.33	7.32	22.13	4.57	14.07	4.21	12.56	23.51	9.59		
	23.826	-1.13	22.320	-9.76	22.480	-10.80	1.602	9.91	2.267	12.62	2.808	14.01	21.443	-15.75	20.546	-18.59	16.855	-11.18	11.65822	17
19	3.53	19.56	5.11	15.29	5.26	15.45	6.39	20.38	7.01	21.27	7.25	22.07	4.49	13.60	4.13	12.48	23.43	9.52		
	23.948	-0.34	22.374	-9.94	22.636	-9.93	1.695	10.46	2.295	12.76	2.821	14.07	21.450	-15.73	20.549	-18.57	16.854	-11.17	11.78963	19
21	3.47	20.01	5.07	15.25	5.23	15.51	6.33	20.39	6.54	21.22	7.17	22.00	4.41	13.53	4.05	12.40	23.35	9.44		
	0.069	0.45	22.446	-9.97	22.792	-9.05	1.788	11.01	2.322	12.91	2.835	14.14	21.456	-15.70	20.553	-18.56	16.854	-11.16	11.92105	21
23	3.42	20.05	5.04	15.23	5.19	15.57	6.28	20.40	6.47	21.17	7.10	21.54	4.34	13.45	3.58	12.33	23.28	9.36		
	0.191	1.24	22.536	-9.86	22.947	-8.15	1.881	11.55	2.350	13.06	2.849	14.21	21.462	-15.67	20.556	-18.55	16.854	-11.15	12.05246	23
25	3.36	20.10	5.01	15.23	5.16	16.04	6.22	20.41	6.40	21.12	7.03	21.47	4.26	13.38	3.50	12.25	23.20	9.28		
	0.312	2.03	22.641	-9.62	23.102	-7.24	1.974	12.09	2.379	13.20	2.863	14.28	21.468	-15.64	20.559	-18.54	16.853	-11.14	12.18388	25
27	4.30	21.14	5.58	16.24	6.12	17.10	7.17	21.41	7.33	22.06	7.55	22.40	5.18	14.30	4.42	13.18	0.16	10.20		
	0.431	2.79	22.757	-9.26	23.252	-6.33	2.065	12.60	2.407	13.35	2.877	14.35	21.474	-15.61	20.562	-18.53	16.852	-11.13	12.31530	27
29	4.25	21.19	5.56	16.27	6.08	17.16	7.12	21.42	7.26	22.01	7.48	22.34	5.11	14.23	4.34	13.10	0.08	10.12		
	0.552	3.57	22.886	-8.78	23.405	-5.39	2.159	13.12	2.435	13.49	2.891	14.42	21.479	-15.59	20.565	-18.52	16.851	-11.12	12.44672	29
31	4.19	21.24	5.53	16.30	6.04	17.23	7.06	21.43	7.19	21.56	7.40	22.27	5.03	14.16	4.27	13.02	23.56	10.05		
	0.674	4.35	23.024	-8.20	23.558	-4.44	2.252	13.62	2.464	13.64	2.906	14.49	21.485	-15.56	20.568	-18.51	16.850	-11.11	12.57814	31

KWIECIEŃ 2000

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)											Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2451																			
92	1	Sob	636	23.54317	-3.45	0.4404	4.44	0.99946	22.1536	-13.29	61.386	4.4	12	619	1249.5	1921	530	1017.8	1515	552	1	
93	2	Nie	637	23.58282	-3.27	0.4742	5.07	0.99975	23.0534	-9.32	60.642	5.4	6	617	1249.2	1923	554	1105.4	1628	548	2	
94	3	Pon	638	0.02247	-3.10	0.5122	5.30	1.00004	23.5536	-5.02	59.900	6.4	2	614	1248.9	1925	616	1153.0	1743	544	3	
95	4	Wto	639	0.06213	-2.52	0.5501	5.53	1.00033	0.4612	-0.10	59.213	7.4	0	612	1248.6	1926	637	1241.2	1900	540	4	
96	5	Śro	640	0.10178	-2.35	0.5840	6.16	1.00062	1.3752	4.49	58.631	0.7	1	610	1248.3	1928	658	1330.6	2019	536	5	
97	6	Czw	641	0.14144	-2.18	1.0220	6.39	1.00090	2.3111	9.39	58.186	1.7	4	607	1248.0	1930	721	1421.9	2139	532	6	
98	7	Pią	642	0.18109	-2.01	1.0559	7.01	1.00118	3.2635	13.59	57.894	2.7	9	605	1247.8	1932	747	1515.6	2300	529	7	
99	8	Sob	643	0.22075	-1.45	1.0939	7.24	1.00146	4.2415	17.33	57.754	3.7	17	603	1247.5	1934	818	1611.8	****	525	8	
100	9	Nie	644	0.26041	-1.28	1.1319	7.46	1.00174	5.2353	20.02	57.753	4.7	26	600	1247.2	1935	857	1710.0	018	521	9	
101	10	Pon	645	0.30006	-1.12	1.1660	8.08	1.00202	6.2442	21.15	57.867	5.7	37	558	1246.9	1937	946	1809.4	131	517	10	
102	11	Wto	646	0.33572	-0.56	1.2041	8.30	1.00230	7.2534	21.06	58.073	6.7	48	556	1246.7	1939	1046	1908.4	233	513	11	
103	12	Śro	647	0.37537	-0.41	1.2422	8.52	1.00258	8.2516	19.37	58.352	0.9	60	553	1246.4	1941	1155	2005.8	324	509	12	
104	13	Czw	648	0.41503	-0.26	1.2803	9.14	1.00285	9.2253	16.59	58.689	1.9	70	551	1246.2	1943	1310	2100.6	405	505	13	
105	14	Pią	649	0.45468	-0.11	1.3144	9.35	1.00313	10.1802	13.24	59.076	2.9	80	549	1245.9	1944	1427	2152.6	437	501	14	
106	15	Sob	650	0.49434	0.04	1.3526	9.57	1.00341	11.1047	9.10	59.512	3.9	88	546	1245.7	1946	1544	2242.2	503	457	15	
107	16	Nie	651	0.53399	0.18	1.3909	10.18	1.00368	12.0131	4.31	59.994	4.9	94	544	1245.4	1948	1659	2329.8	525	453	16	
108	17	Pon	652	0.57365	0.32	1.4251	10.39	1.00396	12.5051	-0.16	60.517	5.9	98	542	1245.2	1950	1814	*****	546	449	17	
109	18	Wto	653	1.01330	0.46	1.4634	11.00	1.00423	13.3923	-4.59	61.069	6.9	100	540	1245.0	1952	1927	016.1	606	445	18	
110	19	Śro	654	1.05296	0.59	1.5018	11.21	1.00451	14.2742	-9.23	61.630	0.7	100	537	1244.8	1953	2038	101.9	626	441	19	
111	20	Czw	655	1.09261	1.12	1.5402	11.41	1.00478	15.1616	-13.18	62.171	1.7	97	535	1244.6	1955	2148	147.8	648	437	20	
112	21	Pią	656	1.13227	1.24	1.5746	12.02	1.00506	16.0523	-16.35	62.658	2.7	93	533	1244.3	1957	2255	234.2	712	434	21	
113	22	Sob	657	1.17192	1.36	2.0131	12.22	1.00534	16.5512	-19.06	63.053	3.7	87	531	1244.1	1959	2358	321.3	742	430	22	
114	23	Nie	658	1.21158	1.47	2.0516	12.42	1.00561	17.4538	-20.44	63.321	4.7	80	529	1244.0	2000	****	409.1	817	426	23	
115	24	Pon	659	1.25124	1.58	2.0901	13.02	1.00588	18.3626	-21.27	63.428	5.7	72	527	1243.8	2002	055	457.5	859	422	24	
116	25	Wto	660	1.29089	2.08	2.1248	13.21	1.00616	19.2717	-21.12	63.352	6.7	63	524	1243.6	2004	145	546.0	948	418	25	
117	26	Śro	661	1.33055	2.18	2.1634	13.41	1.00643	20.1752	-20.01	63.083	7.7	54	522	1243.4	2006	227	634.3	1045	414	26	
118	27	Czw	662	1.37020	2.28	2.2021	13.60	1.00670	21.0758	-17.55	62.621	0.6	44	520	1243.3	2008	302	722.1	1148	410	27	
119	28	Pią	663	1.40586	2.37	2.2409	14.19	1.00696	21.5735	-14.59	61.988	1.6	35	518	1243.1	2009	332	809.3	1255	406	28	
120	29	Sob	664	1.44551	2.45	2.2757	14.37	1.00723	22.4651	-11.18	61.218	2.6	25	516	1243.0	2011	357	856.2	1405	402	29	
121	30	Nie	665	1.48517	2.53	2.3146	14.56	1.00749	23.3610	-6.60	60.361	3.6	17	514	1242.9	2013	419	943.0	1519	358	30	

Fazy Księżyca [Dm, h.mm]: Nów 4, 20.12 1kw 11, 15.30 Pełn 18, 19.41 3kw 26, 21.30

MAJ 2000

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2451																			
122	1	Pon	666	1.52482	2.60	2.3536	15.14	1.00775	0.2603	-2.14	59.481	4.6	10	512	1242.7	2015	440	1030.4	1634	354	1	
123	2	Wto	667	1.56448	3.07	2.3925	15.32	1.00800	1.1710	2.47	58.646	5.6	4	510	1242.6	2016	500	1119.1	1753	350	2	
124	3	Śro	668	2.00413	3.13	2.4316	15.49	1.00825	2.1010	7.49	57.925	6.6	1	508	1242.5	2018	522	1209.8	1914	346	3	
125	4	Czw	669	2.04379	3.18	2.4707	16.07	1.00850	3.0539	12.31	57.378	0.2	0	506	1242.4	2020	547	1303.4	2037	342	4	
126	5	Pią	670	2.08344	3.23	2.5058	16.24	1.00874	4.0355	16.33	57.045	1.2	2	504	1242.4	2022	616	1300.0	2200	338	5	
127	6	Sob	671	2.12310	3.28	2.5451	16.41	1.00898	5.0444	19.33	56.940	2.2	7	502	1242.3	2023	652	1459.5	2318	335	6	
128	7	Nie	672	2.16276	3.32	2.5843	16.57	1.00921	6.0713	21.15	57.053	3.2	14	501	1242.2	2025	738	1600.6	****	331	7	
129	8	Pon	673	2.20241	3.35	3.0236	17.13	1.00945	7.0957	21.30	57.355	4.2	24	459	1242.2	2027	836	1701.8	027	327	8	
130	9	Wto	674	2.24207	3.38	3.0630	17.29	1.00967	8.1123	20.20	57.802	5.2	34	457	1242.1	2028	944	1801.1	124	323	9	
131	10	Śro	675	2.28172	3.40	3.1024	17.45	1.00990	9.1020	17.55	58.344	6.2	45	455	1242.1	2030	1058	1857.5	208	319	10	
132	11	Czw	676	2.32138	3.42	3.1419	18.01	1.01012	10.0616	14.30	58.939	0.6	56	453	1242.1	2032	1215	1950.4	242	315	11	
133	12	Pią	677	2.36103	3.43	3.1815	18.16	1.01034	10.5915	10.22	59.551	1.6	67	452	1242.0	2033	1332	2040.2	310	311	12	
134	13	Sob	678	2.40069	3.43	3.2211	18.30	1.01055	11.4949	5.49	60.157	2.6	77	450	1242.0	2035	1448	2127.6	333	307	13	
135	14	Nie	679	2.44034	3.43	3.2607	18.45	1.01077	12.3839	1.04	60.741	3.6	85	448	1242.0	2037	1601	2213.4	353	303	14	
136	15	Pon	680	2.47600	3.43	3.3004	18.59	1.01098	13.2630	-3.39	61.296	4.6	92	447	1242.0	2038	1714	2258.5	412	259	15	
137	16	Wto	681	2.51565	3.42	3.3402	19.13	1.01119	14.1405	-8.08	61.815	5.6	96	445	1242.1	2040	1825	2343.6	431	255	16	
138	17	Śro	682	2.55531	3.40	3.3800	19.26	1.01139	15.0158	-12.13	62.293	6.6	99	444	1242.1	2042	1935	*****	452	251	17	
139	18	Czw	683	2.59497	3.38	3.4159	19.40	1.01160	15.5033	-15.44	62.720	0.1	100	442	1242.1	2043	2043	029.2	515	247	18	
140	19	Pią	684	3.03462	3.35	3.4558	19.52	1.01180	16.4001	-18.32	63.081	1.1	99	441	1242.2	2045	2148	115.8	542	243	19	
141	20	Sob	685	3.07428	3.32	3.4958	20.05	1.01200	17.3019	-20.29	63.357	2.1	96	439	1242.2	2046	2248	203.3	614	239	20	
142	21	Nie	686	3.11393	3.28	3.5358	20.17	1.01220	18.2109	-21.31	63.525	3.1	91	438	1242.3	2048	2341	251.6	653	236	21	
143	22	Pon	687	3.15359	3.24	3.5759	20.29	1.01240	19.1206	-21.35	63.560	4.1	85	437	1242.4	2049	****	340.2	740	232	22	
144	23	Wto	688	3.19325	3.19	4.0201	20.40	1.01259	20.0244	-20.42	63.442	5.1	78	435	1242.4	2051	026	428.6	834	228	23	
145	24	Śro	689	3.23290	3.13	4.0603	20.52	1.01278	20.5242	-18.53	63.153	6.1	70	434	1242.5	2052	104	516.4	934	224	24	
146	25	Czw	690	3.27256	3.07	4.1005	21.02	1.01297	21.4153	-16.15	62.687	7.1	61	433	1242.6	2053	135	603.3	1039	220	25	
147	26	Pią	691	3.31221	3.01	4.1408	21.13	1.01315	22.3024	-12.51	62.050	8.1	51	432	1242.7	2055	201	649.5	1147	216	26	
148	27	Sob	692	3.35187	2.54	4.1812	21.23	1.01333	23.1837	-8.49	61.264	0.9	41	431	1242.8	2056	223	735.2	1258	212	27	
149	28	Nie	693	3.39152	2.47	4.2216	21.32	1.01351	0.0706	-4.17	60.366	1.9	31	429	1243.0	2057	244	821.0	1411	208	28	
150	29	Pon	694	3.43118	2.39	4.2620	21.42	1.01368	0.5633	0.36	59.412	2.9	21	428	1243.1	2059	304	907.9	1526	204	29	
151	30	Wto	695	3.47083	2.30	4.3025	21.51	1.01384	1.4748	5.37	58.471	3.9	13	427	1243.2	2100	324	956.5	1645	200	30	
152	31	Śro	696	3.51049	2.21	4.3431	21.59	1.01401	2.4139	10.30	57.620	4.9	6	426	1243.4	2101	346	1048.0	1807	156	31	

Fazy Księżyca [Dm, h.mm]: Nów 4, 6.12 1kw 10, 22.01 Pełn 18, 9.34 3kw 26, 13.55

MAJ 2000 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE			MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)		
1	2.30	22.60	5.07	19.15	5.03	19.02	5.51	21.52	5.32	20.36	5.47	20.47	3.03	12.19	2.26	11.03	21.51	8.02			
	2.593	15.23	2.051	11.17	1.915	10.40	3.733	20.17	2.938	15.87	3.157	15.60	21.548	-15.28	20.594	-18.41	16.818	-10.95	14.61512	1	
3	2.22	23.08	5.05	19.32	4.60	19.09	5.47	21.52	5.25	20.31	5.39	20.41	2.55	12.12	2.18	10.55	21.43	7.54			
	2.721	15.82	2.307	12.82	2.071	11.29	3.830	20.49	2.970	16.01	3.174	15.67	21.550	-15.27	20.594	-18.41	16.816	-10.95	14.74654	3	
5	2.12	23.18	5.03	19.50	4.56	19.15	5.42	21.52	5.18	20.26	5.32	20.34	2.48	12.04	2.10	10.47	21.35	7.46			
	2.850	16.40	2.572	14.47	2.228	12.16	3.927	20.81	3.001	16.15	3.191	15.74	21.552	-15.26	20.594	-18.41	16.813	-10.94	14.87796	5	
7	2.02	23.28	5.01	20.08	4.53	19.22	5.38	21.52	5.11	20.20	5.25	20.28	2.40	11.56	2.02	10.39	21.27	7.38			
	2.979	16.95	2.847	16.08	2.385	13.02	4.025	21.11	3.033	16.28	3.208	15.81	21.554	-15.25	20.595	-18.41	16.809	-10.93	15.00938	7	
9	1.51	23.40	5.00	20.27	4.49	19.28	5.34	21.52	5.04	20.15	5.17	20.22	2.32	11.49	1.54	10.31	21.19	7.30			
	3.108	17.49	3.129	17.64	2.544	13.85	4.123	21.39	3.065	16.42	3.225	15.88	21.556	-15.24	20.595	-18.41	16.806	-10.92	15.14081	9	
11	1.38	23.54	5.00	20.46	4.46	19.35	5.30	21.52	4.58	20.10	5.10	20.15	2.24	11.41	1.46	10.23	21.10	7.22			
	3.239	18.01	3.418	19.11	2.704	14.66	4.221	21.67	3.096	16.55	3.242	15.95	21.558	-15.24	20.594	-18.41	16.803	-10.91	15.27223	11	
13	1.22	0.24	5.00	21.05	4.43	19.42	5.26	21.52	4.51	20.05	5.03	20.09	2.16	11.33	1.39	10.15	21.02	7.14			
	3.370	18.51	3.711	20.47	2.865	15.45	4.319	21.93	3.128	16.68	3.260	16.02	21.559	-15.23	20.594	-18.41	16.800	-10.90	15.40364	13	
15	*****	*****	5.01	21.24	4.40	19.48	5.22	21.52	4.44	20.00	4.56	20.02	2.09	11.25	1.31	10.08	20.54	7.06			
	3.501	18.98	4.007	21.70	3.027	16.21	4.417	22.17	3.160	16.81	3.277	16.09	21.560	-15.23	20.594	-18.42	16.796	-10.90	15.53506	15	
17	*****	*****	5.03	21.42	4.37	19.55	5.19	21.52	4.37	19.55	4.48	19.56	2.01	11.18	1.23	9.60	20.46	6.58			
	3.633	19.44	4.302	22.77	3.190	16.94	4.516	22.41	3.192	16.94	3.294	16.16	21.561	-15.22	20.593	-18.42	16.793	-10.89	15.66648	17	
19	*****	*****	5.05	21.59	4.35	20.01	5.15	21.52	4.30	19.50	4.41	19.50	1.53	11.10	1.15	9.52	20.38	6.50			
	3.766	19.87	4.593	23.67	3.355	17.65	4.614	22.62	3.224	17.07	3.311	16.22	21.562	-15.22	20.592	-18.42	16.790	-10.88	15.79790	19	
21	*****	*****	5.09	22.14	4.32	20.08	5.11	21.51	4.24	19.45	4.34	19.43	1.45	11.02	1.07	9.44	20.30	6.42			
	3.900	20.29	4.878	24.40	3.520	18.33	4.713	22.83	3.255	17.19	3.328	16.29	21.563	-15.22	20.592	-18.42	16.786	-10.88	15.92932	21	
23	*****	*****	5.13	22.27	4.30	20.14	5.08	21.51	4.17	19.39	4.27	19.37	1.37	10.54	0.59	9.36	20.22	6.34			
	4.034	20.67	5.155	24.95	3.687	18.97	4.811	23.02	3.287	17.32	3.345	16.36	21.563	-15.22	20.591	-18.43	16.783	-10.87	16.06075	23	
25	*****	*****	5.18	22.38	4.28	20.21	5.05	21.50	4.10	19.34	4.19	19.30	1.29	10.46	0.51	9.28	20.14	6.25			
	4.168	21.04	5.420	25.34	3.856	19.58	4.910	23.20	3.319	17.44	3.363	16.42	21.563	-15.22	20.589	-18.43	16.779	-10.87	16.19217	25	
27	*****	*****	5.23	22.48	4.26	20.27	5.01	21.50	4.03	19.29	4.12	19.24	1.22	10.38	0.43	9.20	20.06	6.17			
	4.303	21.38	5.673	25.56	4.025	20.15	5.009	23.36	3.350	17.56	3.380	16.48	21.563	-15.22	20.588	-18.44	16.776	-10.86	16.32358	27	
29	*****	*****	5.29	22.55	4.25	20.33	4.58	21.49	3.57	19.24	4.05	19.17	1.14	10.31	0.35	9.12	19.58	6.09			
	4.439	21.69	5.912	25.65	4.196	20.69	5.108	23.51	3.382	17.68	3.397	16.55	21.563	-15.22	20.587	-18.44	16.772	-10.86	16.45500	29	
31	*****	*****	5.35	22.60	4.24	20.39	4.55	21.48	3.50	19.19	3.58	19.11	1.06	10.23	0.27	9.04	19.49	6.01			
	4.575	21.98	6.137	25.60	4.368	21.19	5.207	23.64	3.413	17.80	3.413	16.61	21.562	-15.23	20.585	-18.45	16.768	-10.85	16.58642	31	

CZERWIEC 2000

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2451																			
153	1	Czw	697	3.55014	2.12	4.3836	22.07	1.01416	3.3844	14.55	56.936	5.9	2	426	1243.5	2102	412	1143.1	1930	152	1	
154	2	Pią	698	3.58580	2.03	4.4243	22.15	1.01431	4.3913	18.29	56.484	6.9	0	425	1243.7	2103	445	1242.0	2053	148	2	
155	3	Sob	699	4.02546	1.53	4.4649	22.22	1.01445	5.4230	20.50	56.303	0.9	1	424	1243.9	2104	526	1344.0	2210	144	3	
156	4	Nie	700	4.06511	1.42	4.5056	22.29	1.01459	6.4712	21.43	56.402	1.9	5	423	1244.0	2105	620	1447.4	2314	141	4	
157	5	Pon	701	4.10477	1.32	4.5503	22.36	1.01473	7.5121	21.02	56.760	2.9	12	423	1244.2	2106	726	1550.0	****	137	5	
158	6	Wto	702	4.14443	1.21	4.5911	22.42	1.01486	8.5313	18.56	57.328	3.9	21	422	1244.4	2107	841	1649.8	006	133	6	
159	7	Śro	703	4.18408	1.09	5.0318	22.48	1.01498	9.5144	15.41	58.044	4.9	31	421	1244.6	2108	1000	1745.6	045	129	7	
160	8	Czw	704	4.22374	0.58	5.0726	22.53	1.01510	10.4640	11.38	58.839	5.9	42	421	1244.8	2109	1119	1837.6	115	125	8	
161	9	Pią	705	4.26339	0.46	5.1135	22.58	1.01521	11.3827	7.05	59.653	0.3	53	420	1245.0	2110	1237	1926.2	140	121	9	
162	10	Sob	706	4.30305	0.34	5.1543	23.03	1.01532	12.2752	2.19	60.439	1.3	63	420	1245.2	2111	1351	2012.5	201	117	10	
163	11	Nie	707	4.34270	0.22	5.1952	23.07	1.01542	13.1547	-2.26	61.163	2.3	73	420	1245.4	2112	1504	2057.5	220	113	11	
164	12	Pon	708	4.38236	0.10	5.2401	23.11	1.01552	14.0302	-6.60	61.804	3.3	82	419	1245.6	2112	1615	2142.1	239	109	12	
165	13	Wto	709	4.42201	-0.03	5.2810	23.14	1.01562	14.5019	-11.11	62.353	4.3	89	419	1245.8	2113	1725	2227.0	258	105	13	
166	14	Śro	710	4.46167	-0.15	5.3219	23.17	1.01571	15.3813	-14.51	62.807	5.3	94	419	1246.0	2113	1833	2312.8	320	101	14	
167	15	Czw	711	4.50133	-0.28	5.3628	23.20	1.01580	16.2703	-17.52	63.167	6.3	98	419	1246.2	2114	1939	2359.7	345	057	15	
168	16	Pią	712	4.54098	-0.41	5.4038	23.22	1.01589	17.1653	-20.04	63.433	7.3	100	419	1246.4	2114	2041	*****	415	053	16	
169	17	Sob	713	4.58064	-0.54	5.4447	23.24	1.01598	18.0730	-21.23	63.603	0.5	100	419	1246.6	2115	2137	047.6	451	049	17	
170	18	Nie	714	5.02029	-1.06	5.4856	23.25	1.01606	18.5829	-21.44	63.671	1.5	98	419	1246.9	2115	2225	136.1	535	045	18	
171	19	Pon	715	5.05595	-1.19	5.5306	23.26	1.01613	19.4919	-21.08	63.627	2.5	95	419	1247.1	2116	2305	224.7	626	042	19	
172	20	Wto	716	5.09561	-1.32	5.5716	23.26	1.01621	20.3929	-19.35	63.458	3.5	90	419	1247.3	2116	2338	312.7	724	038	20	
173	21	Śro	717	5.13526	-1.45	6.0125	23.26	1.01628	21.2844	-17.10	63.152	4.5	83	419	1247.5	2116	****	359.9	828	034	21	
174	22	Czw	718	5.17492	-1.58	6.0535	23.26	1.01634	22.1700	-14.01	62.701	5.5	75	419	1247.7	2116	006	445.9	934	030	22	
175	23	Pią	719	5.21457	-2.11	6.0944	23.25	1.01641	23.0434	-10.13	62.100	6.5	66	419	1247.9	2116	029	531.1	1043	026	23	
176	24	Sob	720	5.25423	-2.24	6.1353	23.24	1.01646	23.5154	-5.54	61.361	7.5	56	420	1248.1	2116	050	615.8	1154	022	24	
177	25	Nie	721	5.29388	-2.37	6.1803	23.22	1.01652	0.3942	-1.14	60.505	0.4	46	420	1248.4	2116	109	700.9	1306	018	25	
178	26	Pon	722	5.33354	-2.50	6.2212	23.20	1.01657	1.2846	3.38	59.573	1.4	36	421	1248.6	2116	128	747.1	1421	014	26	
179	27	Wto	723	5.37319	-3.02	6.2621	23.18	1.01661	2.2002	8.30	58.620	2.4	25	421	1248.8	2116	148	835.6	1539	010	27	
180	28	Śro	724	5.41285	-3.14	6.3030	23.15	1.01665	3.1422	13.04	57.716	3.4	16	422	1249.0	2116	212	927.4	1700	006	28	
181	29	Czw	725	5.45251	-3.27	6.3439	23.12	1.01668	4.1221	17.00	56.942	4.4	8	422	1249.2	2116	240	1023.2	1823	002	29	
182	30	Pią	726	5.49216	-3.38	6.3847	23.08	1.01670	5.1402	19.57	56.373	5.4	3	423	1249.4	2115	315	1123.2	1943	2354	30	

Fazy Księżyca [Dm, h.mm]: Nów 2, 14.14 1kw 9, 5.29 Pełn 17, 0.27 3kw 25, 3.00

CZERWIEC 2000 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	*****	*****	5.38	23.02	4.23	20.42	4.54	21.47	3.47	19.16	3.54	19.08	1.02	10.19	0.24	8.60	19.45	5.57		
	4.643	22.12	6.243	25.53	4.454	21.43	5.256	23.70	3.429	17.86	3.422	16.64	21.562	-15.23	20.584	-18.45	16.767	-10.85	16.652	13
3	*****	*****	5.44	23.04	4.22	20.48	4.51	21.46	3.40	19.11	3.47	19.01	0.54	10.11	0.16	8.52	19.37	5.49		
	4.780	22.37	6.443	25.31	4.627	21.87	5.355	23.82	3.461	17.97	3.439	16.70	21.561	-15.24	20.583	-18.46	16.763	-10.85	16.78355	3
5	*****	*****	5.50	23.04	4.22	20.53	4.48	21.45	3.33	19.06	3.39	18.55	0.46	10.03	0.08	8.44	19.29	5.41		
	4.918	22.60	6.627	24.99	4.802	22.27	5.454	23.92	3.492	18.08	3.455	16.76	21.560	-15.24	20.581	-18.46	16.760	-10.84	16.91498	5
7	*****	*****	5.55	23.03	4.22	20.59	4.46	21.44	3.26	19.00	3.32	18.48	0.38	9.55	23.56	8.36	19.21	5.33		
	5.055	22.80	6.794	24.60	4.977	22.63	5.552	24.00	3.523	18.20	3.472	16.82	21.559	-15.25	20.579	-18.47	16.756	-10.84	17.04640	7
9	*****	*****	5.60	23.00	4.22	21.04	4.43	21.43	3.20	18.55	3.25	18.42	0.30	9.47	23.48	8.28	19.13	5.25		
	5.193	22.97	6.942	24.14	5.154	22.95	5.651	24.07	3.554	18.30	3.488	16.88	21.557	-15.26	20.577	-18.48	16.752	-10.84	17.17782	9
11	*****	*****	6.04	22.56	4.23	21.09	4.41	21.41	3.13	18.50	3.18	18.35	0.22	9.39	23.40	8.20	19.05	5.17		
	5.331	23.12	7.072	23.62	5.331	23.22	5.750	24.13	3.585	18.41	3.505	16.94	21.556	-15.27	20.574	-18.49	16.749	-10.84	17.30924	11
13	*****	*****	6.07	22.51	4.24	21.13	4.38	21.39	3.06	18.44	3.10	18.29	0.14	9.31	23.32	8.12	18.57	5.09		
	5.469	23.24	7.182	23.07	5.508	23.45	5.848	24.17	3.616	18.52	3.521	16.99	21.554	-15.28	20.572	-18.50	16.745	-10.83	17.44065	13
15	*****	*****	6.09	22.44	4.25	21.18	4.36	21.38	2.59	18.39	3.03	18.22	0.07	9.23	23.24	8.04	18.49	5.01		
	5.608	23.33	7.273	22.49	5.687	23.63	5.946	24.20	3.646	18.62	3.537	17.05	21.552	-15.29	20.570	-18.51	16.742	-10.83	17.57208	15
17	*****	*****	6.10	22.35	4.27	21.21	4.34	21.36	2.53	18.34	2.56	18.16	23.55	9.15	23.16	7.56	18.41	4.53		
	5.746	23.39	7.342	21.90	5.865	23.76	6.044	24.22	3.676	18.72	3.553	17.10	21.550	-15.30	20.567	-18.52	16.738	-10.83	17.70350	17
19	*****	*****	6.09	22.26	4.29	21.25	4.32	21.34	2.46	18.28	2.49	18.09	23.47	9.06	23.08	7.47	18.33	4.45		
	5.885	23.43	7.390	21.31	6.044	23.85	6.142	24.22	3.707	18.82	3.568	17.15	21.547	-15.31	20.564	-18.53	16.735	-10.83	17.83492	19
21	*****	*****	6.07	22.16	4.32	21.28	4.30	21.32	2.39	18.23	2.41	18.02	23.39	8.58	23.00	7.39	18.25	4.37		
	6.024	23.44	7.416	20.73	6.224	23.89	6.240	24.20	3.737	18.92	3.584	17.21	21.544	-15.33	20.562	-18.54	16.732	-10.83	17.96634	21
23	*****	*****	6.03	22.04	4.34	21.31	4.28	21.30	2.32	18.17	2.34	17.56	23.31	8.50	22.52	7.31	18.16	4.29		
	6.162	23.42	7.421	20.18	6.403	23.89	6.338	24.18	3.767	19.02	3.599	17.26	21.542	-15.34	20.559	-18.55	16.728	-10.83	18.09776	23
25	*****	*****	5.58	21.52	4.38	21.33	4.26	21.27	2.26	18.12	2.27	17.49	23.23	8.42	22.44	7.23	18.08	4.21		
	6.301	23.37	7.404	19.67	6.582	23.83	6.435	24.14	3.796	19.11	3.615	17.31	21.539	-15.36	20.556	-18.56	16.725	-10.84	18.22918	25
27	*****	*****	5.51	21.38	4.41	21.36	4.25	21.25	2.19	18.07	2.20	17.43	23.15	8.34	22.36	7.15	18.00	4.12		
	6.439	23.30	7.367	19.21	6.761	23.73	6.532	24.08	3.825	19.20	3.630	17.35	21.536	-15.37	20.553	-18.57	16.722	-10.84	18.36060	27
29	*****	*****	5.42	21.25	4.45	21.37	4.23	21.22	2.12	18.01	2.12	17.36	23.07	8.26	22.28	7.07	17.52	4.04		
	6.577	23.20	7.312	18.80	6.940	23.58	6.629	24.01	3.855	19.29	3.644	17.40	21.532	-15.39	20.550	-18.58	16.718	-10.84	18.49202	29

LIPIEC 2000

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2451																			
183	1	Sob	727	5.53182	-3.50	6.4255	23.04	1.01672	6.1833	21.32	56.070	6.4	0	424	1249.6	2115	402	1226.3	2055	2350	1	
184	2	Nie	728	5.57148	-4.02	6.4703	22.60	1.01674	7.2409	21.33	56.066	0.6	1	425	1249.8	2115	502	1330.8	2154	2346	2	
185	3	Pon	729	6.01113	-4.13	6.5111	22.55	1.01674	8.2843	20.00	56.360	1.6	4	425	1250.0	2114	615	1433.9	2241	2343	3	
186	4	Wto	730	6.05079	-4.24	6.5519	22.50	1.01674	9.3028	17.06	56.918	2.6	10	426	1250.1	2114	736	1533.6	2316	2339	4	
187	5	Śro	731	6.09044	-4.34	6.5926	22.44	1.01674	10.2833	13.10	57.678	3.6	18	427	1250.3	2113	858	1629.2	2344	2335	5	
188	6	Czw	732	6.13010	-4.44	7.0332	22.38	1.01673	11.2260	8.37	58.566	4.6	28	428	1250.5	2112	1019	1720.8	****	2331	6	
189	7	Pią	733	6.16575	-4.54	7.0739	22.32	1.01671	12.1423	3.45	59.502	5.6	38	429	1250.6	2112	1137	1809.2	006	2327	7	
190	8	Sob	734	6.20541	-5.03	7.1144	22.25	1.01669	13.0335	-1.07	60.420	6.6	49	430	1250.8	2111	1252	1855.5	027	2323	8	
191	9	Nie	735	6.24506	-5.12	7.1550	22.18	1.01666	13.5131	-5.49	61.266	0.9	59	431	1250.9	2110	1405	1940.6	046	2319	9	
192	10	Pon	736	6.28472	-5.21	7.1955	22.10	1.01663	14.3860	-10.09	62.001	1.9	69	432	1251.1	2109	1515	2025.5	105	2315	10	
193	11	Wto	737	6.32437	-5.29	7.2359	22.02	1.01660	15.2643	-13.58	62.606	2.9	78	433	1251.2	2108	1624	2110.9	126	2311	11	
194	12	Śro	738	6.36403	-5.36	7.2804	21.54	1.01656	16.1508	-17.09	63.072	3.9	85	434	1251.3	2108	1731	2157.2	150	2307	12	
195	13	Czw	739	6.40369	-5.43	7.3207	21.45	1.01651	17.0431	-19.34	63.401	4.9	91	436	1251.5	2107	1834	2244.5	218	2303	13	
196	14	Pią	740	6.44334	-5.50	7.3610	21.36	1.01646	17.5447	-21.07	63.601	5.9	96	437	1251.6	2105	1932	2332.7	252	2259	14	
197	15	Sob	741	6.48300	-5.56	7.4013	21.27	1.01641	18.4537	-21.44	63.683	6.9	99	438	1251.7	2104	2022	*****	332	2255	15	
198	16	Nie	742	6.52266	-6.01	7.4415	21.17	1.01636	19.3634	-21.22	63.655	7.9	100	439	1251.8	2103	2105	021.4	421	2251	16	
199	17	Pon	743	6.56231	-6.06	7.4817	21.07	1.01630	20.2704	-20.04	63.523	0.8	99	441	1251.9	2102	2141	109.8	517	2248	17	
200	18	Wto	744	7.00197	-6.11	7.5218	20.56	1.01624	21.1643	-17.52	63.290	1.8	97	442	1251.9	2101	2210	157.4	619	2244	18	
201	19	Śro	745	7.04162	-6.15	7.5618	20.45	1.01618	22.0519	-14.52	62.955	2.8	93	443	1252.0	2100	2235	243.9	725	2240	19	
202	20	Czw	746	7.08128	-6.18	8.0018	20.34	1.01611	22.5257	-11.14	62.515	3.8	87	445	1252.0	2058	2256	329.4	833	2236	20	
203	21	Pią	747	7.12093	-6.21	8.0417	20.22	1.01604	23.3959	-7.04	61.967	4.8	80	446	1252.1	2057	2315	413.9	943	2232	21	
204	22	Sob	748	7.16059	-6.23	8.0816	20.10	1.01596	0.2657	-2.31	61.314	5.8	71	448	1252.1	2056	2334	458.2	1054	2228	22	
205	23	Nie	749	7.20024	-6.25	8.1215	19.58	1.01588	1.1437	2.13	60.567	6.8	61	449	1252.2	2054	2353	543.0	1206	2224	23	
206	24	Pon	750	7.23590	-6.26	8.1612	19.45	1.01580	2.0348	6.59	59.746	7.8	50	451	1252.2	2053	****	629.3	1321	2220	24	
207	25	Wto	751	7.27555	-6.27	8.2009	19.33	1.01571	2.5525	11.32	58.891	1.0	40	452	1252.2	2051	014	717.9	1438	2216	25	
208	26	Śro	752	7.31521	-6.27	8.2406	19.19	1.01562	3.5015	15.37	58.052	2.0	29	454	1252.2	2050	039	810.0	1557	2212	26	
209	27	Czw	753	7.35487	-6.26	8.2802	19.06	1.01552	4.4844	18.54	57.295	3.0	19	455	1252.2	2048	110	906.2	1716	2208	27	
210	28	Pią	754	7.39452	-6.25	8.3158	18.52	1.01541	5.5041	21.02	56.691	4.0	10	457	1252.2	2046	149	1006.3	1831	2204	28	
211	29	Sob	755	7.43418	-6.24	8.3552	18.38	1.01530	6.5503	21.44	56.306	5.0	4	458	1252.1	2045	242	1109.2	1937	2200	29	
212	30	Nie	756	7.47383	-6.21	8.3947	18.23	1.01519	8.0001	20.53	56.189	6.0	1	500	1252.1	2043	348	1212.9	2030	2156	30	
213	31	Pon	757	7.51349	-6.18	8.4340	18.08	1.01507	9.0335	18.31	56.363	0.3	0	502	1252.1	2041	505	1315.1	2111	2152	31	

Fazy Księżyca [Dm, h.mm]: Nów 1, 21.20 1kw 8, 14.53 Pełn 16, 15.55 3kw 24, 13.02 Nów 31, 4.25

LIPIEC 2000 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	*****	*****	5.33	21.10	4.50	21.38	4.22	21.19	2.06	17.55	2.05	17.29	22.59	8.18	22.20	6.59	17.44	3.56		
	6.715	23.07	7.242	18.47	7.118	23.39	6.726	23.93	3.883	19.38	3.659	17.45	21.529	-15.41	20.546	-18.59	16.715	-10.84	18.62345	1
3	*****	*****	5.22	20.56	4.54	21.39	4.21	21.16	1.59	17.50	1.58	17.22	22.51	8.09	22.12	6.51	17.36	3.48		
	6.853	22.92	7.161	18.22	7.295	23.15	6.822	23.84	3.912	19.46	3.673	17.49	21.525	-15.43	20.543	-18.60	16.712	-10.85	18.75487	3
5	*****	*****	5.10	20.42	4.59	21.40	4.19	21.13	1.52	17.44	1.50	17.16	22.43	8.01	22.04	6.43	17.28	3.40		
	6.990	22.74	7.074	18.04	7.472	22.86	6.918	23.73	3.940	19.55	3.687	17.54	21.521	-15.45	20.540	-18.62	16.709	-10.85	18.88629	5
7	*****	*****	4.57	20.28	5.04	21.40	4.18	21.10	1.45	17.39	1.43	17.09	22.35	7.53	21.56	6.34	17.20	3.32		
	7.127	22.53	6.986	17.96	7.648	22.53	7.014	23.61	3.968	19.63	3.701	17.58	21.518	-15.47	20.536	-18.63	16.707	-10.86	19.01771	7
9	*****	*****	4.44	20.15	5.10	21.40	4.17	21.07	1.39	17.33	1.36	17.02	22.27	7.45	21.48	6.26	17.12	3.24		
	7.264	22.29	6.904	17.97	7.824	22.16	7.109	23.48	3.996	19.71	3.714	17.62	21.513	-15.49	20.533	-18.64	16.704	-10.86	19.14913	9
11	*****	*****	4.32	20.04	5.16	21.39	4.16	21.04	1.32	17.27	1.28	16.55	22.19	7.37	21.40	6.18	17.04	3.16		
	7.400	22.04	6.833	18.06	7.998	21.74	7.204	23.34	4.023	19.78	3.728	17.66	21.509	-15.51	20.530	-18.65	16.701	-10.87	19.28054	11
13	*****	*****	4.19	19.54	5.21	21.38	4.15	21.00	1.25	17.22	1.21	16.49	22.11	7.28	21.32	6.10	16.56	3.08		
	7.535	21.75	6.777	18.24	8.171	21.28	7.299	23.18	4.050	19.86	3.741	17.70	21.505	-15.53	20.526	-18.67	16.699	-10.87	19.41197	13
15	*****	*****	4.08	19.45	5.27	21.37	4.14	20.57	1.18	17.16	1.14	16.42	22.03	7.20	21.24	6.02	16.48	2.60		
	7.670	21.44	6.742	18.48	8.343	20.78	7.393	23.01	4.077	19.93	3.753	17.73	21.501	-15.55	20.522	-18.68	16.696	-10.88	19.54339	15
17	*****	*****	3.57	19.39	5.34	21.36	4.13	20.53	1.11	17.10	1.06	16.35	21.55	7.12	21.16	5.54	16.40	2.52		
	7.805	21.11	6.729	18.78	8.514	20.24	7.487	22.83	4.103	20.00	3.766	17.77	21.496	-15.57	20.519	-18.69	16.694	-10.89	19.67481	17
19	*****	*****	3.48	19.34	5.40	21.34	4.12	20.49	1.05	17.04	0.59	16.28	21.47	7.03	21.08	5.45	16.32	2.44		
	7.938	20.75	6.742	19.12	8.683	19.67	7.580	22.64	4.129	20.07	3.778	17.80	21.491	-15.60	20.515	-18.71	16.691	-10.89	19.80623	19
21	*****	*****	3.40	19.31	5.46	21.32	4.12	20.46	0.58	16.58	0.52	16.21	21.39	6.55	21.00	5.37	16.24	2.36		
	8.072	20.37	6.782	19.48	8.851	19.05	7.674	22.43	4.154	20.14	3.790	17.84	21.487	-15.62	20.512	-18.72	16.689	-10.90	19.93765	21
23	*****	*****	3.33	19.30	5.53	21.30	4.11	20.42	0.51	16.52	0.44	16.14	21.31	6.47	20.52	5.29	16.17	2.28		
	8.204	19.97	6.849	19.86	9.018	18.40	7.766	22.22	4.179	20.20	3.801	17.87	21.482	-15.64	20.508	-18.73	16.687	-10.91	20.06907	23
25	*****	*****	3.29	19.30	5.59	21.27	4.10	20.38	0.44	16.46	0.37	16.07	21.23	6.39	20.44	5.21	16.09	2.20		
	8.336	19.54	6.944	20.22	9.184	17.72	7.858	21.99	4.204	20.26	3.812	17.90	21.477	-15.67	20.504	-18.75	16.685	-10.92	20.20049	25
27	*****	*****	3.26	19.32	6.06	21.24	4.10	20.34	0.37	16.40	0.29	15.60	21.15	6.30	20.36	5.13	16.01	2.12		
	8.467	19.10	7.067	20.54	9.348	17.00	7.950	21.75	4.228	20.32	3.823	17.93	21.472	-15.69	20.500	-18.76	16.683	-10.93	20.33191	27
29	1.16	0.04	3.25	19.35	6.13	21.22	4.09	20.29	0.30	16.34	0.22	15.53	21.07	6.22	20.28	5.05	15.53	2.04		
	8.598	18.63	7.216	20.80	9.511	16.26	8.042	21.51	4.251	20.38	3.833	17.95	21.467	-15.72	20.497	-18.77	16.682	-10.94	20.46333	29
31	1.37	-0.08	3.26	19.39	6.19	21.19	4.09	20.25	0.24	16.28	0.15	15.46	20.59	6.14	20.20	4.56	15.45	1.56		
	8.728	18.14	7.391	20.97	9.673	15.48	8.133	21.25	4.275	20.44	3.843	17.98	21.462	-15.74	20.493	-18.79	16.680	-10.95	20.59476	31

SIERPIEŃ 2000

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)											Czas strefowy [hhmm.]							
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2451																					
214	1	Wto	758	7.55315	-6.15	8.4733	17.53	1.01494	10.0418	14.56	56.815	1.3	3	503	1252.0	2040	628	1413.9	2142	2149	1
215	2	Śro	759	7.59280	-6.11	8.5126	17.38	1.01481	11.0135	10.29	57.504	2.3	8	505	1251.9	2038	753	1508.9	2208	2145	2
216	3	Czw	760	8.03246	-6.06	8.5517	17.22	1.01467	11.5535	5.34	58.362	3.3	15	506	1251.8	2036	915	1600.3	2230	2141	3
217	4	Pią	761	8.07211	-6.00	8.5909	17.06	1.01453	12.4658	0.31	59.311	4.3	24	508	1251.8	2034	1033	1648.9	2250	2137	4
218	5	Sob	762	8.11177	-5.54	9.0259	16.50	1.01438	13.3632	-4.24	60.273	5.3	33	510	1251.7	2032	1149	1735.7	2310	2133	5
219	6	Nie	763	8.15142	-5.48	9.0649	16.33	1.01422	14.2508	-8.57	61.179	6.3	44	511	1251.5	2031	1302	1821.7	2331	2129	6
220	7	Pon	764	8.19108	-5.41	9.1038	16.17	1.01407	15.1329	-13.00	61.976	0.4	54	513	1251.4	2029	1413	1907.5	2353	2125	7
221	8	Wto	765	8.23073	-5.33	9.1427	15.60	1.01390	16.0209	-16.24	62.628	1.4	63	515	1251.3	2027	1521	1953.9	****	2121	8
222	9	Śro	766	8.27039	-5.24	9.1815	15.42	1.01374	16.5129	-19.03	63.114	2.4	72	516	1251.2	2025	1626	2041.0	020	2117	9
223	10	Czw	767	8.31004	-5.15	9.2203	15.25	1.01357	17.4135	-20.50	63.429	3.4	81	518	1251.0	2023	1726	2129.0	052	2113	10
224	11	Pią	768	8.34570	-5.06	9.2550	15.07	1.01340	18.3217	-21.41	63.581	4.4	87	520	1250.8	2021	1819	2217.5	130	2109	11
225	12	Sob	769	8.38536	-4.55	9.2936	14.49	1.01322	19.2314	-21.34	63.584	5.4	93	521	1250.7	2019	1904	2306.0	216	2105	12
226	13	Nie	770	8.42501	-4.45	9.3322	14.31	1.01304	20.1357	-20.30	63.459	6.4	97	523	1250.5	2017	1942	2354.1	310	2101	13
227	14	Pon	771	8.46467	-4.33	9.3707	14.12	1.01286	21.0401	-18.30	63.227	7.4	99	525	1250.3	2015	2014	*****	411	2057	14
228	15	Wto	772	8.50432	-4.22	9.4052	13.54	1.01268	21.5310	-15.40	62.905	0.2	100	527	1250.1	2012	2040	041.3	516	2053	15
229	16	Śro	773	8.54398	-4.09	9.4436	13.35	1.01249	22.4122	-12.08	62.511	1.2	99	528	1249.9	2010	2102	127.4	624	2050	16
230	17	Czw	774	8.58363	-3.56	9.4820	13.15	1.01231	23.2848	-8.02	62.053	2.2	95	530	1249.7	2008	2122	212.5	734	2046	17
231	18	Pią	775	9.02329	-3.43	9.5203	12.56	1.01212	0.1555	-3.32	61.539	3.2	90	532	1249.5	2006	2140	257.1	845	2042	18
232	19	Sob	776	9.06294	-3.29	9.5546	12.36	1.01192	1.0319	1.11	60.973	4.2	83	533	1249.2	2004	2159	341.7	956	2038	19
233	20	Nie	777	9.10260	-3.15	9.5928	12.17	1.01173	1.5142	5.56	60.359	5.2	75	535	1249.0	2002	2219	427.2	1110	2034	20
234	21	Pon	778	9.14225	-2.60	10.0310	11.57	1.01153	2.4153	10.30	59.709	6.2	65	537	1248.7	1959	2242	514.3	1225	2030	21
235	22	Wto	779	9.18191	-2.45	10.0651	11.37	1.01133	3.3436	14.39	59.038	7.2	54	539	1248.5	1957	2309	604.0	1342	2026	22
236	23	Śro	780	9.22156	-2.29	10.1032	11.16	1.01113	4.3024	18.06	58.377	0.6	43	540	1248.2	1955	2344	657.0	1459	2022	23
237	24	Czw	781	9.26122	-2.13	10.1412	10.56	1.01092	5.2924	20.33	57.766	1.6	32	542	1248.0	1953	****	753.6	1614	2018	24
238	25	Pią	782	9.30088	-1.57	10.1752	10.35	1.01071	6.3105	21.44	57.255	2.6	22	544	1247.7	1951	029	853.4	1721	2014	25
239	26	Sob	783	9.34053	-1.40	10.2132	10.14	1.01049	7.3412	21.28	56.899	3.6	13	545	1247.4	1948	127	955.0	1818	2010	26
240	27	Nie	784	9.38019	-1.23	10.2511	9.53	1.01027	8.3708	19.43	56.745	4.6	6	547	1247.1	1946	238	1056.6	1904	2006	27
241	28	Pon	785	9.41584	-1.05	10.2850	9.32	1.01005	9.3823	16.37	56.827	5.6	1	549	1246.8	1944	358	1156.3	1939	2002	28
242	29	Wto	786	9.45550	-0.47	10.3229	9.11	1.00982	10.3659	12.28	57.154	6.6	0	551	1246.5	1941	522	1253.1	2007	1958	29
243	30	Śro	787	9.49515	-0.29	10.3607	8.49	1.00959	11.3245	7.39	57.709	1.0	1	552	1246.2	1939	646	1346.6	2031	1955	30
244	31	Czw	788	9.53481	-0.10	10.3945	8.28	1.00935	12.2557	2.30	58.447	2.0	5	554	1245.9	1937	808	1437.4	2052	1951	31

Fazy Księżyca [Dm, h.mm]: 1kw 7, 3.02 Pełn 15, 7.13 3kw 22, 20.51 Now 29, 12.19

WRZESIEŃ 2000

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)											Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2451																			
245	1	Pią	789	9.57446	0.09	10.4323	8.06	1.00911	13.1714	-2.37	59.307	3.0	11	556	1245.6	1934	927	1526.2	2112	1947	1	
246	2	Sob	790	10.01412	0.28	10.4700	7.44	1.00886	14.0718	-7.28	60.214	4.0	19	557	1245.3	1932	1043	1613.7	2133	1943	2	
247	3	Nie	791	10.05377	0.47	10.5037	7.22	1.00861	14.5649	-11.50	61.098	5.0	28	559	1245.0	1930	1157	1700.7	2155	1939	3	
248	4	Pon	792	10.09343	1.07	10.5414	6.60	1.00836	15.4619	-15.32	61.896	6.0	38	601	1244.6	1927	1308	1747.8	2220	1935	4	
249	5	Wto	793	10.13308	1.27	10.5751	6.37	1.00811	16.3612	-18.28	62.556	7.0	47	603	1244.3	1925	1415	1835.4	2250	1931	5	
250	6	Śro	794	10.17274	1.47	11.0127	6.15	1.00785	17.2635	-20.32	63.046	0.7	57	604	1244.0	1923	1518	1923.5	2326	1927	6	
251	7	Czw	795	10.21239	2.08	11.0503	5.53	1.00759	18.1724	-21.40	63.348	1.7	66	606	1243.6	1920	1614	2012.1	****	1923	7	
252	8	Pią	796	10.25205	2.29	11.0839	5.30	1.00733	19.0824	-21.49	63.459	2.7	75	608	1243.3	1918	1702	2100.7	010	1919	8	
253	9	Sob	797	10.29171	2.49	11.1215	5.07	1.00707	19.5914	-21.00	63.393	3.7	83	609	1242.9	1915	1742	2149.0	101	1915	9	
254	10	Nie	798	10.33136	3.10	11.1550	4.45	1.00680	20.4932	-19.14	63.171	4.7	89	611	1242.6	1913	1816	2236.6	200	1911	10	
255	11	Pon	799	10.37102	3.32	11.1926	4.22	1.00654	21.3903	-16.36	62.823	5.7	94	613	1242.2	1911	1843	2323.2	304	1907	11	
256	12	Wto	800	10.41067	3.53	11.2301	3.59	1.00627	22.2745	-13.12	62.383	6.7	98	614	1241.9	1908	1907	*****	411	1903	12	
257	13	Śro	801	10.45033	4.14	11.2636	3.36	1.00600	23.1545	-9.11	61.884	7.7	100	616	1241.5	1906	1927	009.0	522	1859	13	
258	14	Czw	802	10.48598	4.36	11.3011	3.13	1.00573	0.0326	-4.41	61.355	0.6	100	618	1241.2	1903	1946	054.2	633	1856	14	
259	15	Pią	803	10.52563	4.57	11.3346	2.50	1.00547	0.5117	0.06	60.820	1.6	97	620	1240.8	1901	2005	139.4	746	1852	15	
260	16	Sob	804	10.56529	5.19	11.3722	2.27	1.00520	1.3957	4.57	60.296	2.6	93	621	1240.4	1858	2024	225.1	900	1848	16	
261	17	Nie	805	11.00494	5.40	11.4057	2.04	1.00493	2.3004	9.39	59.791	3.6	86	623	1240.1	1856	2046	312.1	1015	1844	17	
262	18	Pon	806	11.04460	6.01	11.4432	1.41	1.00466	3.2218	13.57	59.312	4.6	78	625	1239.7	1854	2111	401.2	1132	1840	18	
263	19	Wto	807	11.08426	6.23	11.4807	1.17	1.00439	4.1706	17.34	58.862	5.6	68	626	1239.4	1851	2143	453.1	1250	1836	19	
264	20	Śro	808	11.12391	6.44	11.5142	0.54	1.00412	5.1437	20.15	58.448	6.6	57	628	1239.0	1849	2224	547.9	1405	1832	20	
265	21	Czw	809	11.16357	7.05	11.5517	0.31	1.00385	6.1426	21.45	58.085	0.4	46	630	1238.7	1846	2316	645.5	1513	1828	21	
266	22	Pią	810	11.20322	7.27	11.5853	0.07	1.00358	7.1538	21.53	57.792	1.4	35	632	1238.3	1844	****	744.9	1612	1824	22	
267	23	Sob	811	11.24288	7.48	12.0228	-0.16	1.00330	8.1655	20.35	57.599	2.4	24	633	1238.0	1841	020	844.7	1700	1820	23	
268	24	Nie	812	11.28253	8.08	12.0604	-0.39	1.00302	9.1702	17.57	57.535	3.4	15	635	1237.6	1839	135	943.4	1737	1816	24	
269	25	Pon	813	11.32219	8.29	12.0940	-1.03	1.00275	10.1507	14.13	57.627	4.4	8	637	1237.3	1837	256	1039.8	1807	1812	25	
270	26	Wto	814	11.36184	8.50	12.1316	-1.26	1.00247	11.1051	9.38	57.894	5.4	3	639	1236.9	1834	418	1133.7	1832	1808	26	
271	27	Śro	815	11.40150	9.10	12.1652	-1.50	1.00218	12.0425	4.35	58.334	6.4	0	640	1236.6	1832	540	1225.0	1854	1804	27	
272	28	Czw	816	11.44115	9.30	12.2029	-2.13	1.00190	12.5618	-0.38	58.930	0.6	0	642	1236.2	1829	701	1314.6	1914	1800	28	
273	29	Pią	817	11.48081	9.50	12.2406	-2.36	1.00161	13.4706	-5.42	59.644	1.6	3	644	1235.9	1827	819	1403.0	1934	1757	29	
274	30	Sob	818	11.52046	10.09	12.2742	-2.60	1.00132	14.3724	-10.22	60.422	2.6	8	646	1235.6	1825	935	1450.8	1955	1753	30	

Fazy Księżyca [Dm, h.mm]: 1kw 5, 18.27 Pełn 13, 21.37 3kw 21, 3.28 Nów 27, 21.53

WRZESIEŃ 2000 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	3.44	21.46	6.51	19.56	8.05	20.15	4.02	19.07	22.27	14.44	22.10	13.48	18.51	4.00	18.13	2.46	13.40	23.44		
	10.723	8.10	11.347	5.52	12.124	0.37	9.528	15.88	4.564	21.06	3.947	18.20	21.380	-16.13	20.439	-18.99	16.673	-11.17	22.69745	1
3	3.50	21.39	7.04	19.52	8.12	20.10	4.02	19.01	22.19	14.37	22.02	13.40	18.43	3.52	18.05	2.38	13.32	23.36		
	10.844	7.36	11.559	3.96	12.273	-0.66	9.611	15.48	4.576	21.08	3.949	18.20	21.375	-16.15	20.436	-19.00	16.674	-11.19	22.82887	3
5	3.55	21.33	7.17	19.48	8.18	20.06	4.02	18.56	22.12	14.30	21.54	13.32	18.35	3.44	17.57	2.30	13.24	23.28		
	10.964	6.62	11.764	2.41	12.421	-1.69	9.695	15.07	4.587	21.10	3.951	18.20	21.370	-16.17	20.433	-19.01	16.675	-11.21	22.96029	5
7	3.60	21.27	7.29	19.44	8.25	20.01	4.01	18.50	22.05	14.23	21.46	13.24	18.27	3.36	17.49	2.22	13.17	23.20		
	11.084	5.88	11.964	0.88	12.570	-2.72	9.777	14.66	4.597	21.12	3.953	18.20	21.366	-16.19	20.431	-19.01	16.676	-11.23	23.09171	7
9	4.05	21.20	7.41	19.40	8.31	19.57	4.01	18.45	21.57	14.16	21.39	13.17	18.19	3.27	17.41	2.14	13.09	23.13		
	11.204	5.12	12.158	-0.64	12.719	-3.74	9.860	14.24	4.607	21.14	3.954	18.19	21.361	-16.21	20.428	-19.02	16.677	-11.24	23.22313	9
11	4.09	21.14	7.52	19.35	8.38	19.52	4.01	18.39	21.50	14.09	21.31	13.09	18.11	3.19	17.33	2.06	13.01	23.05		
	11.324	4.37	12.348	-2.14	12.867	-4.77	9.942	13.82	4.616	21.15	3.955	18.19	21.357	-16.23	20.426	-19.03	16.679	-11.26	23.35455	11
13	4.14	21.08	8.04	19.31	8.44	19.48	4.00	18.34	21.42	14.01	21.23	13.01	18.03	3.11	17.25	1.58	12.54	22.57		
	11.443	3.60	12.533	-3.60	13.017	-5.78	10.023	13.39	4.624	21.17	3.955	18.18	21.353	-16.25	20.424	-19.04	16.680	-11.28	23.48596	13
15	4.18	21.02	8.14	19.26	8.51	19.44	3.60	18.28	21.35	13.54	21.15	12.53	17.55	3.03	17.17	1.49	12.46	22.49		
	11.563	2.83	12.715	-5.03	13.166	-6.79	10.104	12.96	4.631	21.18	3.954	18.18	21.349	-16.27	20.421	-19.05	16.682	-11.30	23.61738	15
17	4.23	20.57	8.24	19.21	8.57	19.39	3.59	18.23	21.27	13.47	21.07	12.45	17.47	2.55	17.09	1.41	12.38	22.41		
	11.682	2.06	12.892	-6.43	13.317	-7.79	10.185	12.52	4.637	21.19	3.953	18.17	21.345	-16.29	20.419	-19.06	16.684	-11.32	23.74879	17
19	4.27	20.51	8.34	19.16	9.04	19.35	3.59	18.17	21.20	13.39	20.59	12.37	17.39	2.46	17.01	1.33	12.31	22.33		
	11.802	1.29	13.066	-7.79	13.468	-8.78	10.266	12.07	4.642	21.20	3.952	18.16	21.341	-16.30	20.417	-19.06	16.686	-11.33	23.88021	19
21	4.31	20.45	8.44	19.11	9.11	19.31	3.58	18.11	21.12	13.32	20.52	12.29	17.31	2.38	16.53	1.25	12.23	22.25		
	11.921	0.51	13.236	-9.10	13.619	-9.76	10.346	11.63	4.646	21.20	3.950	18.15	21.337	-16.32	20.416	-19.07	16.688	-11.35	0.01164	21
23	4.35	20.40	8.53	19.06	9.17	19.27	3.58	18.06	21.04	13.24	20.44	12.21	17.23	2.30	16.45	1.17	12.16	22.18		
	12.041	-0.27	13.402	-10.37	13.772	-10.72	10.426	11.17	4.650	21.21	3.948	18.13	21.334	-16.33	20.414	-19.08	16.690	-11.37	0.14306	23
25	4.40	20.34	9.02	19.01	9.24	19.23	3.57	17.60	20.57	13.16	20.36	12.13	17.15	2.22	16.37	1.09	12.08	22.10		
	12.161	-1.05	13.564	-11.59	13.925	-11.67	10.506	10.72	4.652	21.21	3.945	18.12	21.331	-16.35	20.412	-19.08	16.692	-11.39	0.27448	25
27	4.44	20.29	9.10	18.56	9.31	19.19	3.57	17.54	20.49	13.09	20.28	12.04	17.07	2.14	16.29	1.01	12.00	22.02		
	12.281	-1.83	13.723	-12.76	14.079	-12.60	10.585	10.26	4.654	21.21	3.941	18.10	21.328	-16.36	20.411	-19.09	16.695	-11.41	0.40589	27
29	4.48	20.24	9.18	18.51	9.37	19.15	3.56	17.48	20.41	13.01	20.20	11.56	16.59	2.06	16.22	0.53	11.53	21.54		
	12.402	-2.60	13.877	-13.86	14.234	-13.51	10.664	9.79	4.654	21.21	3.938	18.09	21.325	-16.37	20.410	-19.09	16.697	-11.43	0.53731	29

PAŹDZIERNIK 2000

Piwnice, CA UMK			← Dane na godz. 12 czasu strefowego (= 10 lub 11 ^b UT) →										Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2451																		
275	1	Nie	819	11.56012	10.29	12.3120	-3.23	1.00103	15.2742	-14.26	61.205	3.6	14	647	1235.3	1822	1049	1538.8	2019	1749	1
276	2	Pon	820	11.59577	10.48	12.3457	-3.46	1.00074	16.1818	-17.45	61.933	4.6	22	649	1235.0	1820	1200	1627.0	2047	1745	2
277	3	Wto	821	12.03543	11.06	12.3835	-4.09	1.00045	17.0918	-20.10	62.550	5.6	31	651	1234.6	1817	1306	1715.8	2121	1741	3
278	4	Śro	822	12.07508	11.25	12.4213	-4.32	1.00016	18.0036	-21.39	63.013	6.6	40	653	1234.3	1815	1406	1804.8	2202	1737	4
279	5	Czw	823	12.11474	11.43	12.4552	-4.56	0.99986	18.5156	-22.07	63.290	7.6	50	654	1234.0	1813	1458	1853.7	2250	1733	5
280	6	Pią	824	12.15440	12.00	12.4931	-5.19	0.99957	19.4257	-21.36	63.367	1.0	59	656	1233.7	1810	1541	1942.2	2346	1729	6
281	7	Sob	825	12.19405	12.18	12.5310	-5.42	0.99927	20.3322	-20.07	63.244	2.0	68	658	1233.5	1808	1617	2030.0	****	1725	7
282	8	Nie	826	12.23371	12.35	12.5650	-6.04	0.99898	21.2257	-17.44	62.938	3.0	77	700	1233.2	1806	1646	2116.8	048	1721	8
283	9	Pon	827	12.27336	12.51	13.0030	-6.27	0.99869	22.1144	-14.33	62.477	4.0	84	701	1232.9	1803	1711	2202.7	155	1717	9
284	10	Wto	828	12.31302	13.07	13.0410	-6.50	0.99839	22.5953	-10.40	61.903	5.0	91	703	1232.6	1801	1732	2248.2	304	1713	10
285	11	Śro	829	12.35267	13.23	13.0751	-7.13	0.99810	23.4745	-6.15	61.261	6.0	96	705	1232.4	1759	1751	2333.5	416	1709	11
286	12	Czw	830	12.39233	13.38	13.1133	-7.35	0.99782	0.3553	-1.27	60.601	7.0	99	707	1232.1	1756	1810	*****	529	1705	12
287	13	Pią	831	12.43198	13.52	13.1515	-7.57	0.99753	1.2453	3.32	59.968	0.0	100	709	1231.9	1754	1829	019.5	644	1702	13
288	14	Sob	832	12.47164	14.07	13.1857	-8.20	0.99725	2.1525	8.27	59.400	1.0	99	710	1231.6	1752	1850	106.8	801	1658	14
289	15	Nie	833	12.51129	14.20	13.2240	-8.42	0.99696	3.0804	13.01	58.923	2.0	95	712	1231.4	1750	1914	156.2	919	1654	15
290	16	Pon	834	12.55095	14.33	13.2624	-9.04	0.99668	4.0316	16.58	58.551	3.0	89	714	1231.2	1747	1943	248.2	1039	1650	16
291	17	Wto	835	12.59060	14.45	13.3008	-9.26	0.99641	5.0102	19.58	58.286	4.0	81	716	1231.0	1745	2021	343.1	1156	1646	17
292	18	Śro	836	13.03026	14.57	13.3353	-9.48	0.99613	6.0056	21.47	58.118	5.0	71	718	1230.8	1743	2110	440.7	1308	1642	18
293	19	Czw	837	13.06592	15.08	13.3738	-10.09	0.99586	7.0156	22.14	58.039	6.0	60	720	1230.6	1741	2210	539.9	1410	1638	19
294	20	Pią	838	13.10557	15.18	13.4125	-10.31	0.99558	8.0245	21.16	58.039	0.1	49	721	1230.4	1739	2321	639.3	1501	1634	20
295	21	Sob	839	13.14523	15.28	13.4511	-10.52	0.99531	9.0210	18.58	58.112	1.1	38	723	1230.3	1736	****	737.4	1540	1630	21
296	22	Nie	840	13.18488	15.37	13.4859	-11.14	0.99504	9.5927	15.32	58.262	2.1	27	725	1230.1	1734	039	833.1	1611	1626	22
297	23	Pon	841	13.22454	15.46	13.5247	-11.35	0.99477	10.5420	11.14	58.494	3.1	18	727	1230.0	1732	159	926.3	1636	1622	23
298	24	Wto	842	13.26419	15.53	13.5636	-11.55	0.99450	11.4707	6.23	58.815	4.1	10	729	1229.9	1730	320	1017.0	1658	1618	24
299	25	Śro	843	13.30385	16.00	14.0026	-12.16	0.99423	12.3819	1.14	59.230	5.1	4	731	1229.7	1728	439	1105.9	1718	1614	25
300	26	Czw	844	13.34350	16.06	14.0416	-12.37	0.99397	13.2836	-3.53	59.736	6.1	1	733	1229.6	1726	557	1153.8	1737	1610	26
301	27	Pią	845	13.38316	16.12	14.0807	-12.57	0.99370	14.1835	-8.45	60.317	0.1	0	735	1229.6	1724	714	1241.4	1757	1606	27
302	28	Sob	846	13.42281	16.16	14.1159	-13.17	0.99343	15.0847	-13.07	60.946	1.1	1	736	1229.5	1722	829	1329.2	1819	1603	28
303	29	Nie	847	13.46247	16.20	14.1552	-13.37	0.99317	15.5930	-16.48	61.585	2.1	5	738	1229.4	1720	942	1417.6	1845	1559	29
303	29	Nie	847	14.46345	16.21	14.1601	-13.38	0.99315	16.0138	-16.56	61.611	3.1	5	638	1129.4	1620	842	1317.6	1745	1459	29
304	30	Pon	848	14.50311	16.24	14.1955	-13.57	0.99289	16.5259	-19.43	62.214	3.1	10	640	1129.4	1618	952	1406.7	1816	1455	30
305	31	Wto	849	14.54276	16.26	14.2349	-14.17	0.99262	17.4447	-21.32	62.733	4.1	17	642	1129.3	1616	1055	1456.2	1854	1451	31

Fazy Księżyca [Dm, h.mm]: 1kw 5, 12.59 Pełn 13, 10.53 3kw 20, 9.59 Now 27, 9.58 Now 27, 8.58

PAŹDZIERNIK 2000 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.51	20.19	9.25	18.46	9.44	19.11	3.56	17.43	20.33	12.53	20.12	11.48	16.51	1.57	16.14	0.46	11.45	21.46		
	12.522	-3.38	14.025	-14.90	14.391	-14.40	10.743	9.33	4.654	21.20	3.933	18.07	21.322	-16.39	20.409	-19.10	16.700	-11.45	0.66872	1
3	4.55	20.14	9.32	18.41	9.51	19.07	3.55	17.37	20.25	12.45	20.04	11.40	16.43	1.49	16.06	0.38	11.38	21.39		
	12.643	-4.15	14.167	-15.87	14.548	-15.27	10.821	8.86	4.653	21.20	3.929	18.05	21.319	-16.40	20.408	-19.10	16.703	-11.47	0.80014	3
5	4.59	20.09	9.37	18.35	9.58	19.04	3.55	17.31	20.17	12.37	19.56	11.31	16.35	1.41	15.58	0.30	11.30	21.31		
	12.764	-4.93	14.301	-16.75	14.707	-16.12	10.899	8.39	4.650	21.19	3.923	18.03	21.317	-16.41	20.407	-19.10	16.706	-11.49	0.93156	5
7	5.03	20.04	9.42	18.30	10.05	19.00	3.54	17.25	20.09	12.29	19.48	11.23	16.27	1.33	15.50	0.22	11.22	21.23		
	12.886	-5.69	14.426	-17.54	14.867	-16.94	10.977	7.91	4.647	21.18	3.918	18.01	21.315	-16.42	20.406	-19.11	16.709	-11.50	1.06299	7
9	5.07	19.59	9.45	18.25	10.11	18.57	3.54	17.19	20.01	12.20	19.40	11.15	16.19	1.25	15.42	0.14	11.15	21.15		
	13.008	-6.45	14.539	-18.24	15.028	-17.73	11.055	7.44	4.643	21.17	3.912	17.98	21.313	-16.42	20.406	-19.11	16.712	-11.52	1.19440	9
11	5.10	19.54	9.47	18.19	10.18	18.54	3.53	17.13	19.53	12.12	19.31	11.06	16.11	1.17	15.34	0.06	11.07	21.07		
	13.131	-7.21	14.638	-18.81	15.190	-18.49	11.132	6.96	4.638	21.16	3.905	17.96	21.311	-16.43	20.405	-19.11	16.716	-11.54	1.32582	11
13	5.14	19.50	9.47	18.13	10.25	18.51	3.52	17.08	19.45	12.04	19.23	10.58	16.03	1.09	15.26	23.54	10.60	20.60		
	13.254	-7.96	14.720	-19.26	15.354	-19.22	11.209	6.48	4.632	21.15	3.898	17.93	21.310	-16.44	20.405	-19.11	16.719	-11.56	1.45723	13
15	5.17	19.45	9.45	18.07	10.31	18.48	3.52	17.02	19.37	11.55	19.15	10.49	15.55	1.01	15.18	23.46	10.52	20.52		
	13.378	-8.70	14.781	-19.54	15.519	-19.92	11.286	5.99	4.625	21.13	3.891	17.91	21.308	-16.44	20.405	-19.11	16.723	-11.58	1.58865	15
17	5.21	19.41	9.40	18.00	10.38	18.46	3.51	16.56	19.29	11.47	19.07	10.41	15.48	0.53	15.11	23.38	10.45	20.44		
	13.502	-9.43	14.817	-19.64	15.685	-20.58	11.363	5.51	4.617	21.12	3.883	17.88	21.307	-16.45	20.405	-19.11	16.727	-11.60	1.72007	17
19	5.25	19.37	9.31	17.54	10.45	18.44	3.51	16.50	19.20	11.38	18.59	10.32	15.40	0.45	15.03	23.30	10.37	20.36		
	13.627	-10.16	14.822	-19.53	15.852	-21.21	11.440	5.02	4.608	21.10	3.875	17.85	21.306	-16.45	20.405	-19.11	16.730	-11.62	1.85149	19
21	5.28	19.32	9.19	17.46	10.51	18.42	3.50	16.44	19.12	11.30	18.51	10.24	15.32	0.37	14.55	23.23	10.30	20.29		
	13.753	-10.87	14.792	-19.17	16.021	-21.80	11.516	4.54	4.598	21.08	3.867	17.82	21.305	-16.45	20.406	-19.11	16.734	-11.64	1.98291	21
23	5.31	19.28	9.03	17.39	10.57	18.40	3.49	16.38	19.04	11.21	18.43	10.15	15.24	0.30	14.47	23.15	10.22	20.21		
	13.880	-11.58	14.726	-18.52	16.191	-22.36	11.593	4.05	4.588	21.06	3.858	17.80	21.305	-16.45	20.406	-19.11	16.738	-11.65	2.11433	23
25	5.35	19.25	8.43	17.31	11.04	18.39	3.49	16.32	18.55	11.13	18.34	10.07	15.16	0.22	14.39	23.07	10.15	20.13		
	14.007	-12.27	14.624	-17.58	16.362	-22.87	11.669	3.56	4.576	21.03	3.849	17.76	21.305	-16.45	20.407	-19.11	16.742	-11.67	2.24575	25
27	5.38	19.21	8.20	17.23	11.09	18.38	3.48	16.26	18.47	11.04	18.26	9.58	15.08	0.14	14.31	22.59	10.07	20.05		
	14.135	-12.95	14.493	-16.37	16.535	-23.34	11.745	3.07	4.564	21.01	3.840	17.73	21.305	-16.45	20.408	-19.11	16.747	-11.69	2.37716	27
29	5.42	19.17	7.55	17.15	11.15	18.37	3.47	16.20	18.39	10.55	18.18	9.49	15.00	0.06	14.24	22.51	9.60	19.58		
	14.264	-13.62	14.343	-14.96	16.708	-23.77	11.821	2.58	4.551	20.98	3.830	17.70	21.305	-16.45	20.409	-19.11	16.751	-11.71	2.50858	29
29	4.42	18.17	6.54	16.15	10.16	17.37	2.47	15.20	17.38	9.55	17.18	8.49	14.00	23.02	13.24	21.51	8.60	18.58		
	14.267	-13.63	14.340	-14.93	16.712	-23.77	11.822	2.57	4.551	20.98	3.830	17.70	21.305	-16.45	20.409	-19.10	16.751	-11.71	2.50858	29
31	4.45	18.14	6.29	16.07	10.21	17.37	2.47	15.14	17.30	9.46	17.10	8.41	13.52	22.54	13.16	21.44	8.52	18.50		
	14.397	-14.28	14.191	-13.44	16.886	-24.16	11.898	2.08	4.537	20.95	3.820	17.67	21.305	-16.45	20.410	-19.10	16.755	-11.73	2.64000	31

LISTOPAD 2000

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)											Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2451																			
306	1	Śro	850	14.58242	16.28	14.2744	-14.36	0.99236	18.3637	-22.20	63.125	5.1	24	644	1129.3	1614	1151	1545.7	1940	1447	1	
307	2	Czw	851	15.02208	16.28	14.3140	-14.55	0.99210	19.2804	-22.07	63.353	6.1	33	646	1129.3	1612	1239	1634.7	2033	1443	2	
308	3	Pią	852	15.06173	16.28	14.3536	-15.14	0.99184	20.1843	-20.55	63.391	7.1	42	648	1129.3	1610	1317	1722.8	2133	1439	3	
309	4	Sob	853	15.10139	16.28	14.3934	-15.32	0.99158	21.0819	-18.47	63.226	0.1	51	650	1129.3	1608	1349	1809.6	2237	1435	4	
310	5	Nie	854	15.14104	16.26	14.4332	-15.50	0.99132	21.5653	-15.51	62.861	1.1	61	652	1129.3	1606	1414	1855.4	2345	1431	5	
311	6	Pon	855	15.18070	16.24	14.4731	-16.08	0.99107	22.4438	-12.12	62.317	2.1	70	653	1129.4	1605	1436	1940.4	****	1427	6	
312	7	Wto	856	15.22035	16.20	14.5131	-16.26	0.99082	23.3159	-7.57	61.628	3.1	79	655	1129.4	1603	1456	2025.2	055	1423	7	
313	8	Śro	857	15.26001	16.16	14.5531	-16.44	0.99057	0.1933	-3.15	60.844	4.1	86	657	1129.5	1601	1514	2110.4	207	1419	8	
314	9	Czw	858	15.29566	16.11	14.5933	-17.01	0.99033	1.0802	1.44	60.024	5.1	93	659	1129.6	1559	1532	2157.0	321	1415	9	
315	10	Pią	859	15.33532	16.06	15.0335	-17.18	0.99009	1.5812	6.47	59.233	6.1	97	701	1129.7	1558	1552	2245.8	437	1411	10	
316	11	Sob	860	15.37497	15.59	15.0738	-17.34	0.98986	2.5046	11.38	58.534	7.1	100	703	1129.8	1556	1615	2337.5	556	1407	11	
317	12	Nie	861	15.41463	15.52	15.1142	-17.50	0.98963	3.4617	15.57	57.977	0.6	100	705	1129.9	1555	1642	*****	718	1404	12	
318	13	Pon	862	15.45429	15.43	15.1547	-18.06	0.98940	4.4453	19.23	57.600	1.6	97	706	1130.0	1553	1717	032.7	839	1400	13	
319	14	Wto	863	15.49394	15.34	15.1953	-18.22	0.98918	5.4604	21.39	57.414	2.6	91	708	1130.2	1551	1802	131.2	957	1356	14	
320	15	Śro	864	15.53360	15.24	15.2359	-18.37	0.98897	6.4840	22.28	57.413	3.6	84	710	1130.3	1550	1900	231.9	1105	1352	15	
321	16	Czw	865	15.57326	15.13	15.2807	-18.52	0.98876	7.5102	21.48	57.572	4.6	74	712	1130.5	1549	2010	333.1	1201	1348	16	
322	17	Pią	866	16.01291	15.01	15.3215	-19.07	0.98855	8.5140	19.43	57.857	5.6	63	714	1130.7	1547	2127	432.9	1244	1344	17	
323	18	Sob	867	16.05257	14.49	15.3624	-19.21	0.98834	9.4935	16.27	58.231	6.6	52	716	1130.9	1546	2247	529.9	1317	1340	18	
324	19	Nie	868	16.09222	14.36	15.4034	-19.35	0.98814	10.4435	12.18	58.665	0.8	41	717	1131.2	1544	****	623.6	1343	1336	19	
325	20	Pon	869	16.13188	14.21	15.4445	-19.49	0.98795	11.3658	7.34	59.134	1.8	30	719	1131.4	1543	007	714.2	1405	1332	20	
326	21	Wto	870	16.17153	14.06	15.4856	-20.02	0.98775	12.2726	2.31	59.624	2.8	21	721	1131.6	1542	125	802.6	1425	1328	21	
327	22	Śro	871	16.21119	13.50	15.5309	-20.15	0.98756	13.1645	-2.34	60.129	3.8	13	723	1131.9	1541	242	849.6	1443	1324	22	
328	23	Czw	872	16.25084	13.34	15.5722	-20.27	0.98737	14.0543	-7.28	60.644	4.8	7	724	1132.2	1540	358	936.1	1502	1320	23	
329	24	Pią	873	16.29050	13.16	16.0136	-20.39	0.98719	14.5458	-11.58	61.166	5.8	2	726	1132.5	1539	512	1022.8	1522	1316	24	
330	25	Sob	874	16.33015	12.58	16.0551	-20.51	0.98701	15.4457	-15.51	61.686	6.8	0	728	1132.8	1538	626	1110.3	1546	1312	25	
331	26	Nie	875	16.36581	12.39	16.1006	-21.02	0.98683	16.3551	-18.58	62.190	0.5	0	729	1133.1	1537	737	1158.9	1614	1309	26	
332	27	Pon	876	16.40547	12.19	16.1423	-21.13	0.98665	17.2732	-21.09	62.656	1.5	2	731	1133.4	1536	843	1248.3	1649	1305	27	
333	28	Wto	877	16.44512	11.59	16.1840	-21.24	0.98648	18.1936	-22.20	63.053	2.5	6	732	1133.8	1535	943	1338.0	1731	1301	28	
334	29	Śro	878	16.48478	11.38	16.2257	-21.34	0.98630	19.1129	-22.28	63.351	3.5	11	734	1134.1	1534	1035	1427.6	1822	1257	29	
335	30	Czw	879	16.52444	11.16	16.2716	-21.44	0.98613	20.0236	-21.36	63.517	4.5	18	736	1134.5	1533	1117	1516.2	1919	1253	30	

Fazy Księżyca [Dm, h.mm]: 1kw 4, 8.27 Pełn 11, 22.15 3kw 18, 16.25 Now 26, 0.11

LISTOPAD 2000 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.47	18.12	6.16	16.03	10.24	17.37	2.46	15.11	17.26	9.42	17.05	8.36	13.48	22.50	13.12	21.40	8.48	18.46		
	14.462	-14.60	14.122	-12.71	16.973	-24.33	11.936	1.84	4.530	20.94	3.815	17.65	21.306	-16.44	20.411	-19.10	16.758	-11.74	2.70572	1
3	4.50	18.09	5.54	15.56	10.29	17.37	2.45	15.05	17.17	9.33	16.57	8.28	13.41	22.43	13.04	21.32	8.41	18.39		
	14.593	-15.23	14.006	-11.42	17.149	-24.65	12.011	1.35	4.515	20.91	3.805	17.62	21.306	-16.44	20.412	-19.10	16.762	-11.75	2.83714	3
5	4.53	18.06	5.36	15.49	10.34	17.37	2.45	14.59	17.09	9.24	16.49	8.19	13.33	22.35	12.56	21.24	8.33	18.31		
	14.725	-15.84	13.931	-10.43	17.325	-24.91	12.087	0.86	4.500	20.87	3.794	17.58	21.307	-16.43	20.414	-19.09	16.767	-11.77	2.96856	5
7	4.56	18.03	5.23	15.43	10.38	17.38	2.44	14.53	17.00	9.14	16.41	8.10	13.25	22.27	12.48	21.17	8.26	18.23		
	14.858	-16.44	13.901	-9.81	17.502	-25.13	12.162	0.37	4.484	20.84	3.784	17.55	21.309	-16.43	20.415	-19.09	16.771	-11.79	3.09997	7
9	4.60	17.60	5.15	15.37	10.42	17.40	2.43	14.47	16.52	9.05	16.32	8.01	13.17	22.19	12.41	21.09	8.18	18.15		
	14.992	-17.01	13.916	-9.58	17.678	-25.31	12.237	-0.12	4.467	20.80	3.773	17.52	21.310	-16.42	20.417	-19.08	16.776	-11.80	3.23139	9
11	5.03	17.57	5.11	15.32	10.46	17.41	2.42	14.42	16.43	8.56	16.24	7.53	13.09	22.12	12.33	21.01	8.11	18.08		
	15.127	-17.57	13.973	-9.69	17.856	-25.43	12.313	-0.60	4.450	20.77	3.762	17.48	21.312	-16.41	20.419	-19.07	16.781	-11.82	3.36281	11
13	5.06	17.55	5.11	15.27	10.49	17.43	2.42	14.36	16.34	8.47	16.16	7.44	13.01	22.04	12.25	20.53	8.03	18.00		
	15.263	-18.10	14.063	-10.09	18.033	-25.50	12.388	-1.09	4.433	20.73	3.751	17.45	21.314	-16.40	20.421	-19.07	16.785	-11.84	3.49423	13
15	5.09	17.52	5.13	15.23	10.52	17.46	2.41	14.30	16.26	8.38	16.08	7.35	12.54	21.56	12.17	20.46	7.56	17.52		
	15.400	-18.62	14.182	-10.72	18.210	-25.53	12.463	-1.57	4.415	20.69	3.740	17.41	21.316	-16.39	20.424	-19.06	16.790	-11.85	3.62565	15
17	5.12	17.50	5.18	15.19	10.55	17.49	2.40	14.24	16.17	8.29	15.59	7.26	12.46	21.49	12.10	20.38	7.48	17.45		
	15.537	-19.11	14.323	-11.51	18.387	-25.51	12.538	-2.06	4.397	20.65	3.729	17.38	21.318	-16.38	20.426	-19.05	16.795	-11.87	3.75708	17
19	5.15	17.48	5.25	15.15	10.57	17.52	2.39	14.18	16.08	8.19	15.51	7.18	12.38	21.41	12.02	20.30	7.41	17.37		
	15.676	-19.58	14.480	-12.42	18.563	-25.43	12.613	-2.54	4.378	20.61	3.718	17.34	21.320	-16.36	20.429	-19.04	16.800	-11.88	3.88850	19
21	5.18	17.46	5.33	15.12	10.59	17.56	2.38	14.12	15.60	8.10	15.43	7.09	12.30	21.33	11.54	20.23	7.33	17.29		
	15.816	-20.03	14.650	-13.39	18.739	-25.31	12.688	-3.01	4.359	20.57	3.707	17.31	21.323	-16.35	20.431	-19.03	16.805	-11.90	4.01991	21
23	5.20	17.44	5.42	15.09	10.60	17.60	2.38	14.06	15.51	8.01	15.34	7.00	12.23	21.26	11.46	20.15	7.26	17.22		
	15.956	-20.45	14.831	-14.41	18.914	-25.14	12.763	-3.49	4.340	20.53	3.696	17.27	21.326	-16.34	20.434	-19.03	16.810	-11.91	4.15133	23
25	5.23	17.43	5.52	15.06	11.01	18.04	2.37	14.00	15.42	7.51	15.26	6.51	12.15	21.18	11.39	20.08	7.18	17.14		
	16.097	-20.85	15.019	-15.44	19.088	-24.92	12.838	-3.96	4.321	20.49	3.685	17.24	21.329	-16.32	20.437	-19.02	16.815	-11.93	4.28275	25
27	5.26	17.42	6.02	15.03	11.01	18.09	2.36	13.54	15.33	7.42	15.18	6.43	12.07	21.11	11.31	19.60	7.11	17.07		
	16.240	-21.22	15.213	-16.46	19.261	-24.66	12.912	-4.44	4.302	20.45	3.674	17.21	21.333	-16.30	20.440	-19.01	16.820	-11.94	4.41417	27
29	5.28	17.41	6.12	15.01	11.01	18.14	2.35	13.48	15.25	7.33	15.09	6.34	11.59	21.03	11.23	19.52	7.04	16.59		
	16.383	-21.57	15.413	-17.46	19.433	-24.35	12.987	-4.90	4.283	20.40	3.663	17.17	21.336	-16.29	20.444	-18.99	16.825	-11.95	4.54560	29

GRUDZIEŃ 2000

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]									
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°/′	j astr	h.mmss	°/′	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2451																			
336	1	Pią	880	16.56409	10.53	16.3135	-21.53	0.98597	20.5233	-19.47	63.521	5.5	25	737	1134.9	1532	1151	1603.5	2022	1249	1	
337	2	Sob	881	17.00375	10.30	16.3554	-22.02	0.98581	21.4109	-17.07	63.342	6.5	34	738	1135.2	1532	1218	1649.4	2128	1245	2	
338	3	Nie	882	17.04340	10.07	16.4015	-22.10	0.98565	22.2833	-13.43	62.970	7.5	43	740	1135.6	1531	1241	1733.9	2236	1241	3	
339	4	Pon	883	17.08306	9.42	16.4435	-22.18	0.98550	23.1510	-9.44	62.408	0.3	53	741	1136.0	1531	1301	1817.8	2346	1237	4	
340	5	Wto	884	17.12271	9.18	16.4857	-22.26	0.98535	0.0135	-5.15	61.678	1.3	63	743	1136.5	1530	1319	1901.7	****	1233	5	
341	6	Śro	885	17.16237	8.52	16.5318	-22.33	0.98520	0.4835	-0.26	60.817	2.3	72	744	1136.9	1530	1336	1946.4	057	1229	6	
342	7	Czw	886	17.20202	8.27	16.5741	-22.40	0.98506	1.3701	4.33	59.880	3.3	81	745	1137.3	1529	1355	2033.1	211	1225	7	
343	8	Pią	887	17.24168	8.00	17.0204	-22.46	0.98493	2.2748	9.29	58.937	4.3	89	746	1137.7	1529	1415	2122.7	327	1221	8	
344	9	Sob	888	17.28133	7.34	17.0627	-22.52	0.98480	3.2145	14.06	58.065	5.3	95	748	1138.2	1529	1439	2216.1	448	1217	9	
345	10	Nie	889	17.32099	7.07	17.1050	-22.57	0.98468	4.1925	18.02	57.340	6.3	99	749	1138.6	1528	1510	2313.7	610	1213	10	
346	11	Pon	890	17.36065	6.39	17.1514	-23.02	0.98456	5.2042	20.55	56.827	0.1	100	750	1139.1	1528	1551	*****	732	1210	11	
347	12	Wto	891	17.40030	6.11	17.1939	-23.07	0.98446	6.2439	22.25	56.567	1.1	98	751	1139.6	1528	1644	015.0	847	1206	12	
348	13	Śro	892	17.43596	5.43	17.2404	-23.11	0.98435	7.2928	22.19	56.573	2.1	94	752	1140.0	1528	1751	118.4	952	1202	13	
349	14	Czw	893	17.47561	5.15	17.2829	-23.14	0.98425	8.3305	20.39	56.827	3.1	87	753	1140.5	1528	1909	221.5	1042	1158	14	
350	15	Pią	894	17.51527	4.46	17.3254	-23.18	0.98416	9.3354	17.37	57.285	4.1	78	754	1141.0	1528	2031	322.0	1120	1154	15	
351	16	Sob	895	17.55493	4.17	17.3720	-23.20	0.98408	10.3113	13.34	57.892	5.1	67	754	1141.5	1528	2154	418.7	1149	1150	16	
352	17	Nie	896	17.59458	3.47	17.4146	-23.22	0.98400	11.2510	8.52	58.586	6.1	56	755	1142.0	1529	2314	511.5	1212	1146	17	
353	18	Pon	897	18.03424	3.18	17.4612	-23.24	0.98392	12.1625	3.49	59.311	0.4	45	756	1142.4	1529	****	601.1	1233	1142	18	
354	19	Wto	898	18.07389	2.48	17.5038	-23.25	0.98385	13.0551	-1.18	60.025	1.4	35	757	1142.9	1529	031	648.5	1251	1138	19	
355	20	Śro	899	18.11355	2.18	17.5504	-23.26	0.98378	13.5424	-6.15	60.699	2.4	25	757	1143.4	1530	147	734.6	1309	1134	20	
356	21	Czw	900	18.15320	1.49	17.5931	-23.26	0.98372	14.4252	-10.49	61.317	3.4	17	758	1143.9	1530	301	820.5	1329	1130	21	
357	22	Pią	901	18.19286	1.19	18.0357	-23.26	0.98367	15.3154	-14.51	61.871	4.4	10	758	1144.4	1531	414	907.0	1351	1126	22	
358	23	Sob	902	18.23251	0.49	18.0824	-23.25	0.98361	16.2152	-18.10	62.359	5.4	5	759	1144.9	1531	525	954.4	1417	1122	23	
359	24	Nie	903	18.27217	0.19	18.1250	-23.24	0.98356	17.1249	-20.37	62.781	6.4	1	759	1145.4	1532	632	1042.9	1448	1118	24	
360	25	Pon	904	18.31183	-0.11	18.1717	-23.23	0.98352	18.0431	-22.07	63.135	7.4	0	759	1145.9	1533	735	1132.2	1527	1114	25	
361	26	Wto	905	18.35148	-0.41	18.2143	-23.21	0.98348	18.5625	-22.35	63.412	0.7	0	759	1146.4	1533	829	1222.0	1615	1111	26	
362	27	Śro	906	18.39114	-1.11	18.2609	-23.18	0.98344	19.4752	-22.00	63.601	1.7	3	800	1146.9	1534	915	1311.0	1710	1107	27	
363	28	Czw	907	18.43080	-1.40	18.3035	-23.15	0.98340	20.3816	-20.28	63.683	2.7	7	800	1147.4	1535	952	1358.9	1811	1103	28	
364	29	Pią	908	18.47045	-2.09	18.3501	-23.12	0.98337	21.2716	-18.03	63.638	3.7	12	800	1147.9	1536	1022	1445.3	1916	1059	29	
365	30	Sob	909	18.51011	-2.38	18.3927	-23.08	0.98335	22.1449	-14.52	63.446	4.7	19	800	1148.4	1537	1046	1530.1	2023	1055	30	
366	31	Nie	910	18.54576	-3.07	18.4352	-23.03	0.98333	23.0109	-11.05	63.092	5.7	27	800	1148.9	1538	1107	1613.6	2131	1051	31	

Fazy Księżyca [Dm, h.mm]: 1kw 4, 4.55 Pełn 11, 10.03 3kw 18, 1.41 Nów 25, 18.21

GRUDZIEŃ 2000 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	5.31	17.40	6.23	14.59	11.01	18.19	2.34	13.42	15.16	7.24	15.01	6.25	11.51	20.56	11.15	19.45	6.56	16.51		
	16.526	-21.88	15.616	-18.43	19.604	-23.99	13.062	-5.37	4.264	20.36	3.652	17.14	21.340	-16.27	20.447	-18.98	16.831	-11.97	4.67702	1
3	5.33	17.39	6.33	14.58	10.60	18.24	2.33	13.36	15.07	7.14	14.53	6.17	11.44	20.48	11.08	19.37	6.49	16.44		
	16.671	-22.17	15.824	-19.35	19.773	-23.59	13.137	-5.83	4.245	20.32	3.641	17.11	21.344	-16.25	20.450	-18.97	16.836	-11.98	4.80844	3
5	5.35	17.38	6.44	14.57	10.59	18.30	2.32	13.31	14.59	7.05	14.44	6.08	11.36	20.41	10.60	19.30	6.41	16.36		
	16.816	-22.43	16.034	-20.21	19.940	-23.15	13.212	-6.29	4.226	20.28	3.631	17.08	21.348	-16.23	20.454	-18.96	16.841	-11.99	4.93986	5
7	5.37	17.38	6.54	14.56	10.57	18.35	2.31	13.25	14.50	6.56	14.36	5.59	11.28	20.33	10.52	19.22	6.34	16.28		
	16.961	-22.67	16.248	-21.02	20.106	-22.67	13.287	-6.75	4.207	20.23	3.621	17.05	21.353	-16.21	20.458	-18.95	16.846	-12.00	5.07127	7
9	5.39	17.38	7.05	14.56	10.55	18.41	2.30	13.19	14.41	6.46	14.28	5.51	11.21	20.26	10.44	19.15	6.26	16.21		
	17.107	-22.87	16.464	-21.77	20.271	-22.14	13.361	-7.20	4.189	20.19	3.611	17.02	21.357	-16.18	20.462	-18.93	16.851	-12.01	5.20269	9
11	5.41	17.38	7.15	14.56	10.53	18.47	2.29	13.13	14.33	6.37	14.20	5.42	11.13	20.18	10.37	19.07	6.19	16.13		
	17.254	-23.04	16.683	-22.45	20.433	-21.58	13.436	-7.65	4.171	20.15	3.601	16.99	21.362	-16.16	20.465	-18.92	16.856	-12.02	5.33412	11
13	5.43	17.38	7.25	14.57	10.50	18.53	2.29	13.07	14.24	6.28	14.11	5.33	11.05	20.11	10.29	18.59	6.11	16.06		
	17.401	-23.18	16.904	-23.05	20.593	-20.98	13.511	-8.09	4.154	20.11	3.591	16.97	21.367	-16.14	20.469	-18.91	16.861	-12.03	5.46554	13
15	5.44	17.38	7.34	14.59	10.48	18.59	2.28	13.01	14.15	6.19	14.03	5.25	10.57	20.03	10.21	18.52	6.04	15.58		
	17.548	-23.29	17.128	-23.58	20.752	-20.34	13.586	-8.53	4.136	20.07	3.582	16.94	21.372	-16.11	20.474	-18.89	16.866	-12.04	5.59696	15
17	5.46	17.39	7.43	15.01	10.45	19.05	2.27	12.56	14.07	6.10	13.55	5.16	10.50	19.56	10.14	18.44	5.56	15.50		
	17.696	-23.37	17.354	-24.03	20.908	-19.67	13.661	-8.97	4.120	20.03	3.573	16.92	21.377	-16.09	20.478	-18.88	16.871	-12.05	5.72838	17
19	5.47	17.40	7.52	15.04	10.41	19.11	2.26	12.50	13.58	6.01	13.47	5.08	10.42	19.49	10.06	18.37	5.49	15.43		
	17.844	-23.42	17.582	-24.39	21.062	-18.97	13.736	-9.40	4.104	20.00	3.565	16.89	21.383	-16.06	20.482	-18.86	16.876	-12.06	5.85980	19
21	5.48	17.41	8.00	15.08	10.38	19.17	2.25	12.44	13.50	5.52	13.38	4.59	10.34	19.41	9.58	18.29	5.41	15.35		
	17.992	-23.44	17.812	-24.68	21.214	-18.24	13.811	-9.82	4.088	19.96	3.556	16.87	21.388	-16.03	20.487	-18.85	16.881	-12.07	5.99122	21
23	5.49	17.42	8.08	15.12	10.34	19.23	2.24	12.38	13.41	5.43	13.30	4.51	10.27	19.34	9.51	18.22	5.34	15.27		
	18.140	-23.42	18.044	-24.87	21.364	-17.48	13.886	-10.24	4.074	19.93	3.548	16.85	21.394	-16.01	20.491	-18.83	16.886	-12.08	6.12264	23
25	5.50	17.43	8.14	15.17	10.30	19.29	2.23	12.33	13.33	5.34	13.22	4.42	10.19	19.27	9.43	18.14	5.26	15.20		
	18.288	-23.38	18.277	-24.97	21.512	-16.69	13.961	-10.66	4.059	19.90	3.541	16.83	21.400	-15.98	20.496	-18.82	16.891	-12.09	6.25407	25
27	5.51	17.44	8.21	15.23	10.26	19.35	2.21	12.27	13.24	5.25	13.14	4.34	10.11	19.19	9.35	18.07	5.18	15.12		
	18.436	-23.30	18.512	-24.98	21.658	-15.88	14.036	-11.07	4.046	19.87	3.534	16.82	21.406	-15.95	20.500	-18.80	16.896	-12.09	6.38549	27
29	5.51	17.46	8.26	15.30	10.21	19.41	2.20	12.21	13.16	5.16	13.06	4.25	10.04	19.12	9.27	17.59	5.11	15.05		
	18.584	-23.19	18.748	-24.89	21.801	-15.04	14.111	-11.48	4.033	19.84	3.527	16.80	21.412	-15.92	20.505	-18.79	16.901	-12.10	6.51691	29
31	5.51	17.48	8.31	15.38	10.17	19.46	2.19	12.16	13.07	5.07	12.58	4.17	9.56	19.05	9.20	17.52	5.03	14.57		
	18.731	-23.06	18.985	-24.70	21.943	-14.18	14.186	-11.87	4.021	19.81	3.521	16.79	21.419	-15.89	20.510	-18.77	16.906	-12.11	6.64833	31

Święta państwowe i kościelne w Polsce oraz inne ważniejsze dni w roku 2000

Nowy Rok	Sob	1 styczeń	Dzień Dziecka	Czw	1 czerwiec
Najświętszej Maryi Panny Rodzicielki	Sob	1 styczeń	Dzień Dziękczynienia	Nie	4 czerwiec
Objawienia Pańskiego (Trzech Króli)	Czw	6 styczeń	Zesłania Ducha Świętego	Nie	11 czerwiec
Juliański Nowy Rok	Pią	14 styczeń	Trójcy Najświętszej	Nie	18 czerwiec
Dzień Babci	Pią	21 styczeń	Boże Ciało	Czw	22 czerwiec
Dzień Dziadka	Sob	22 styczeń	Dzień Ojca	Pią	23 czerwiec
Ofiarowania Pańskiego	Śro	2 luty	Noc Świętojańska	Pią	23 czerwiec
Matki Boskiej Gromnicznej	Śro	2 luty	Św. Piotra i Pawła	Czw	29 czerwiec
Walentynki	Pon	14 luty	Najświętszego Serca Pana Jezusa	Pią	30 czerwiec
Święto UMK	Sob	19 luty	Wniebowzięcia N.M.P.	Wto	15 sierpień
Tłusty czwartek	Czw	2 marzec	Święto Wojska Polskiego	Wto	15 sierpień
Środa Popielcowa	Śro	8 marzec	Dzień Solidarności i Wolności	Czw	31 sierpień
Dzień Kobiet	Śro	8 marzec	Dzień Programisty	Śro	13 wrzesień
Narodowy Dzień Życia	Pią	24 marzec	Dożynki – Święto Plonów	Sob	23 wrzesień
Niedziela Palmowa	Nie	16 kwiecień	Dzień Edukacji Narodowej	Sob	14 październik
Niedziela Wielkanocna	Nie	23 kwiecień	Dzień Papieski	Nie	15 październik
Niedziela Miłosierdzia Bożego	Nie	30 kwiecień	Dzień Papieża Jana Pawła II	Pon	16 październik
Święto Pracy	Pon	1 maj	Wszystkich Świętych	Śro	1 listopad
Dzień Flagi Rzeczypospolitej Polskiej	Wto	2 maj	Zaduszki	Czw	2 listopad
Najświętsza Maryja Królowa Polski	Śro	3 maj	Święto Niepodległości	Sob	11 listopad
Święto Konstytucji 3 Maja	Śro	3 maj	Pierwsza niedziela Adwentu	Nie	3 grudzień
Dzień Polskiej Niezapominajki	Pon	15 maj	Niepokalane Poczęcie N.M.P.	Pią	8 grudzień
Dzień Matki	Pią	26 maj	Boże Narodzenie	Pon	25 grudzień
Wniebowstąpienia Pańskiego	Czw	1 czerwiec	Sylwester	Nie	31 grudzień

Kalendarz astronomiczny 2001

PIWNICE, CA UMK

Współrzędne geograficzne: 18.5641°E 53.0955°N, Nr strefy czasowej (> 0 , gdy na wschód) = 1 (CSE)

Kalendarz jest gregoriańskim i jest oparty na efemerydach Układu Słonecznego obliczanych z dokładnością 1' (Słońce 2", Księżyc 10", Pluton 15'). Czas gwiazdowy ma dokładność około 0.1 s. Wschody i zachody obliczono z uwzględnieniem horyzontalnej refrakcji astronomicznej (34'), rozciągłości Słońca lub Księżyca i paralaksy horyzontalnej Księżyca. Dla dat odległych o więcej niż ok. 300 lat od roku 1950 dokładności położenia planet są gorsze niż 1'!
(Kalendarz ten opracowano [KMB] w Katedrze Radioastronomii CA UMK, Toruń—Piwnice. Oblicz. dnia 7.10.2010 r.)

Data Wielkanocy: **2001 KWIECIEŃ 15**

Dla całego roku przyjęto: TDT – UT = 64 s

Pory roku [miesiąc dzień, godz. mm] (czas zimowy): Wiosna **III 20, 14.31**, Lato **VI 21, 8.38**, Jesień **IX 23, 0.05**, Zima **XII 21, 20.21**

Dane w czasie letnim odróżniono kolorem brązowym; czas ten obowiązuje **od 25 marca do 28 października 2001 r.**

Oznaczenia:

Dr — dzień 2001 roku (1 stycznia Dr = 1)

Dm — dzień miesiąca

Dt — dzień tygodnia

JD — data juliańska modulo 1000 o 12^h UT

(po nagłówku: Entier(JD/1000) dla Dm = 1)

ST — prawdziwy czas gwiazdowy

$\Delta\alpha$ — różnica czasu (czas słoneczny prawdziwy minus średni)

α — rektascensja (Słońca lub Księżyca)

δ — deklinacja (Słońca lub Księżyca)

R — odległość (Słońca lub Księżyca)

j_{astr} — jednostka astronomiczna

ρ_{\oplus} — promień Ziemi

Faza \leftarrow dni po kwadrze i % oświetlonej części tarczy Księżyca

Wsch — wschód (Słońca, Księżyca lub planety)

Gór — górowanie czyli tranzyt (Gal. = centrum Galaktyki)

Zach — zachód (Słońca, Księżyca lub planety)

STYCZEŃ 2001

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)											Czas strefowy [hhmm.]							
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°/′	j astr	h.mmss	°/′	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2451																		
1	1	Pon	911	18.58542	-3.35	18.4817	-22.58	0.98331	23.4648	-6.49	62.566	6.7	36	800	1149.3	1539	1125	1656.5	2240	1047	1
2	2	Wto	912	19.02507	-4.04	18.5241	-22.53	0.98329	0.3227	-2.12	61.874	7.7	45	800	1149.8	1540	1142	1739.5	2351	1043	2
3	3	Śro	913	19.06473	-4.31	18.5706	-22.47	0.98329	1.1856	2.37	61.037	0.5	55	759	1150.3	1541	1159	1823.8	****	1039	3
4	4	Czw	914	19.10438	-4.59	19.0129	-22.41	0.98329	2.0712	7.28	60.091	1.5	66	759	1150.7	1543	1217	1910.2	103	1035	4
5	5	Pią	915	19.14404	-5.25	19.0553	-22.34	0.98329	2.5813	12.08	59.093	2.5	75	759	1151.2	1544	1239	1900.0	219	1031	5
6	6	Sob	916	19.18369	-5.52	19.1016	-22.27	0.98330	3.5251	16.20	58.116	3.5	84	758	1151.6	1545	1305	2054.1	338	1027	6
7	7	Nie	917	19.22335	-6.18	19.1438	-22.20	0.98331	4.5136	19.42	57.242	4.5	92	758	1152.0	1547	1339	2152.8	500	1023	7
8	8	Pon	918	19.26301	-6.43	19.1900	-22.12	0.98334	5.5412	21.53	56.555	5.5	97	757	1152.5	1548	1425	2255.4	619	1019	8
9	9	Wto	919	19.30267	-7.08	19.2322	-22.03	0.98336	6.5925	22.34	56.125	6.5	100	757	1152.9	1549	1525	2360.0	730	1016	9
10	10	Śro	920	19.34232	-7.32	19.2743	-21.55	0.98340	8.0510	21.35	55.994	0.6	99	756	1153.3	1551	1640	000.0	829	1012	10
11	11	Czw	921	19.38198	-7.56	19.3203	-21.45	0.98344	9.0917	19.02	56.172	1.6	96	755	1153.7	1552	1803	103.9	915	1008	11
12	12	Pią	922	19.42163	-8.19	19.3623	-21.36	0.98349	10.1013	15.13	56.632	2.6	90	755	1154.1	1554	1930	204.9	949	1004	12
13	13	Sob	923	19.46129	-8.42	19.4042	-21.25	0.98354	11.0728	10.31	57.317	3.6	82	754	1154.4	1556	2055	301.8	1016	1000	13
14	14	Nie	924	19.50094	-9.04	19.4500	-21.15	0.98360	12.0122	5.22	58.152	4.6	72	753	1154.8	1557	2216	354.7	1038	956	14
15	15	Pon	925	19.54060	-9.25	19.4918	-21.04	0.98367	12.5242	0.05	59.060	5.6	61	752	1155.2	1559	2335	444.5	1057	952	15
16	16	Wto	926	19.58025	-9.45	19.5335	-20.53	0.98374	13.4225	-5.02	59.971	6.6	51	751	1155.5	1600	****	532.2	1116	948	16
17	17	Śro	927	20.01591	-10.05	19.5752	-20.41	0.98382	14.3123	-9.46	60.827	0.9	40	750	1155.8	1602	050	618.8	1135	944	17
18	18	Czw	928	20.05556	-10.25	20.0207	-20.29	0.98390	15.2024	-13.57	61.592	1.9	31	749	1156.2	1604	204	705.2	1156	940	18
19	19	Pią	929	20.09522	-10.43	20.0623	-20.16	0.98398	16.0958	-17.27	62.243	2.9	22	748	1156.5	1606	316	752.2	1221	936	19
20	20	Sob	930	20.13487	-11.01	20.1037	-20.03	0.98407	17.0021	-20.06	62.772	3.9	14	747	1156.8	1607	424	840.1	1250	932	20
21	21	Nie	931	20.17453	-11.18	20.1451	-19.50	0.98417	17.5130	-21.50	63.178	4.9	8	745	1157.0	1609	528	928.8	1326	928	21
22	22	Pon	932	20.21419	-11.34	20.1903	-19.36	0.98427	18.4304	-22.33	63.470	5.9	4	744	1157.3	1611	625	1018.0	1411	924	22
23	23	Wto	933	20.25384	-11.50	20.2316	-19.22	0.98437	19.3429	-22.15	63.654	6.9	1	743	1157.6	1613	713	1107.1	1503	921	23
24	24	Śro	934	20.29350	-12.05	20.2727	-19.08	0.98447	20.2508	-20.57	63.737	7.9	0	742	1157.8	1615	753	1155.4	1602	917	24
25	25	Czw	935	20.33316	-12.19	20.3138	-18.53	0.98458	21.1435	-18.44	63.721	0.9	1	740	1158.1	1616	825	1242.4	1706	913	25
26	26	Pią	936	20.37281	-12.32	20.3547	-18.38	0.98469	22.0236	-15.44	63.602	1.9	3	739	1158.3	1618	851	1327.8	1813	909	26
27	27	Sob	937	20.41247	-12.44	20.3956	-18.23	0.98481	22.4916	-12.05	63.374	2.9	7	737	1158.5	1620	912	1411.7	1921	905	27
28	28	Nie	938	20.45212	-12.56	20.4404	-18.07	0.98492	23.3455	-7.55	63.026	3.9	13	736	1158.7	1622	931	1454.6	2029	901	28
29	29	Pon	939	20.49178	-13.07	20.4812	-17.51	0.98505	0.2007	-3.24	62.549	4.9	20	734	1158.9	1624	948	1537.0	2139	857	29
30	30	Wto	940	20.53143	-13.17	20.5218	-17.34	0.98517	1.0534	1.18	61.941	5.9	29	733	1159.0	1626	1005	1619.9	2249	853	30
31	31	Śro	941	20.57109	-13.26	20.5624	-17.18	0.98530	1.5208	6.04	61.206	6.9	38	731	1159.2	1628	1022	1704.2	****	849	31

Fazy Księżyca [Dm, h.mm]: 1kw 2, 23.31 Pełn 9, 21.25 3kw 16, 13.35 Now 24, 14.07

STYCZEŃ 2001 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	5.51	17.49	8.33	15.42	10.15	19.49	2.19	12.13	13.03	5.03	12.53	4.13	9.52	19.01	9.16	17.48	4.60	14.53		
	18.805	-22.97	19.103	-24.57	22.013	-13.75	14.223	-12.07	4.016	19.80	3.518	16.78	21.422	-15.87	20.512	-18.76	16.908	-12.11	6.71404	1
3	5.51	17.51	8.37	15.51	10.10	19.55	2.18	12.07	12.55	4.54	12.45	4.05	9.44	18.54	9.08	17.41	4.52	14.46		
	18.952	-22.79	19.341	-24.23	22.151	-12.86	14.298	-12.46	4.005	19.78	3.512	16.77	21.428	-15.84	20.517	-18.75	16.913	-12.11	6.84546	3
5	5.51	17.53	8.40	16.01	10.05	20.00	2.17	12.02	12.47	4.46	12.37	3.56	9.37	18.46	9.01	17.33	4.45	14.38		
	19.098	-22.57	19.578	-23.79	22.286	-11.96	14.373	-12.85	3.995	19.76	3.507	16.76	21.435	-15.81	20.522	-18.73	16.918	-12.12	6.97688	5
7	5.51	17.55	8.42	16.11	9.60	20.06	2.15	11.56	12.38	4.37	12.29	3.48	9.29	18.39	8.53	17.26	4.37	14.30		
	19.244	-22.33	19.814	-23.25	22.420	-11.04	14.448	-13.23	3.986	19.74	3.502	16.75	21.442	-15.78	20.527	-18.71	16.922	-12.12	7.10830	7
9	5.50	17.57	8.43	16.23	9.54	20.11	2.14	11.50	12.30	4.29	12.21	3.40	9.21	18.32	8.45	17.18	4.29	14.23		
	19.389	-22.06	20.049	-22.60	22.551	-10.11	14.523	-13.60	3.978	19.73	3.498	16.75	21.448	-15.75	20.532	-18.69	16.927	-12.13	7.23973	9
11	5.49	17.60	8.44	16.34	9.49	20.16	2.13	11.45	12.22	4.20	12.13	3.32	9.14	18.25	8.37	17.11	4.22	14.15		
	19.534	-21.75	20.282	-21.85	22.680	-9.17	14.598	-13.97	3.971	19.72	3.494	16.74	21.455	-15.71	20.537	-18.68	16.931	-12.13	7.37115	11
13	5.48	18.02	8.44	16.46	9.44	20.21	2.12	11.39	12.14	4.12	12.05	3.24	9.06	18.17	8.30	17.04	4.14	14.08		
	19.678	-21.42	20.513	-21.00	22.807	-8.22	14.673	-14.32	3.965	19.71	3.491	16.74	21.462	-15.68	20.542	-18.66	16.935	-12.13	7.50257	13
15	5.47	18.05	8.43	16.58	9.38	20.26	2.10	11.34	12.05	4.04	11.57	3.16	8.58	18.10	8.22	16.56	4.07	13.60		
	19.822	-21.06	20.739	-20.04	22.931	-7.27	14.748	-14.68	3.960	19.70	3.488	16.74	21.469	-15.65	20.547	-18.64	16.940	-12.14	7.63398	15
17	5.46	18.07	8.41	17.10	9.32	20.30	2.09	11.28	11.57	3.56	11.49	3.08	8.51	18.03	8.14	16.49	3.59	13.52		
	19.964	-20.68	20.959	-19.00	23.053	-6.30	14.823	-15.02	3.955	19.70	3.486	16.74	21.476	-15.61	20.552	-18.62	16.944	-12.14	7.76540	17
19	5.44	18.10	8.39	17.23	9.26	20.35	2.08	11.23	11.49	3.48	11.41	2.60	8.43	17.56	8.07	16.41	3.51	13.45		
	20.106	-20.27	21.172	-17.88	23.173	-5.34	14.898	-15.36	3.952	19.69	3.484	16.74	21.484	-15.58	20.557	-18.60	16.948	-12.14	7.89682	19
21	5.43	18.13	8.36	17.34	9.20	20.39	2.06	11.18	11.41	3.40	11.33	2.52	8.36	17.49	7.59	16.34	3.44	13.37		
	20.247	-19.83	21.374	-16.69	23.290	-4.37	14.973	-15.70	3.949	19.70	3.483	16.75	21.491	-15.54	20.563	-18.58	16.952	-12.14	8.02824	21
23	5.41	18.16	8.31	17.45	9.14	20.43	2.05	11.12	11.33	3.32	11.25	2.44	8.28	17.41	7.51	16.26	3.36	13.29		
	20.388	-19.37	21.563	-15.46	23.405	-3.40	15.047	-16.02	3.948	19.70	3.482	16.75	21.498	-15.51	20.568	-18.57	16.955	-12.14	8.15967	23
25	5.39	18.19	8.26	17.55	9.08	20.47	2.04	11.07	11.25	3.24	11.17	2.36	8.20	17.34	7.44	16.19	3.28	13.22		
	20.527	-18.88	21.734	-14.21	23.517	-2.43	15.122	-16.34	3.947	19.71	3.481	16.76	21.506	-15.47	20.573	-18.55	16.959	-12.14	8.29109	25
27	5.36	18.22	8.20	18.04	9.01	20.51	2.02	11.01	11.17	3.16	11.09	2.29	8.13	17.27	7.36	16.11	3.21	13.14		
	20.666	-18.38	21.882	-12.99	23.626	-1.46	15.196	-16.65	3.948	19.72	3.482	16.77	21.513	-15.43	20.578	-18.53	16.963	-12.14	8.42251	27
29	5.34	18.25	8.13	18.10	8.55	20.55	2.01	10.56	11.10	3.08	11.01	2.21	8.05	17.20	7.28	16.04	3.13	13.06		
	20.803	-17.85	22.002	-11.83	23.733	-0.50	15.270	-16.95	3.949	19.73	3.482	16.79	21.521	-15.40	20.583	-18.51	16.966	-12.14	8.55392	29
31	5.31	18.29	8.04	18.13	8.48	20.58	1.59	10.51	11.02	3.01	10.53	2.13	7.57	17.13	7.21	15.57	3.06	12.59		
	20.940	-17.29	22.088	-10.79	23.837	0.45	15.344	-17.25	3.952	19.74	3.484	16.80	21.528	-15.36	20.588	-18.49	16.970	-12.14	8.68534	31

LUTY 2001

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)											Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2451																			
32	1	Czw	942	21.01074	-13.34	21.0028	-17.01	0.98543	2.4042	10.41	60.363	7.9	49	729	1159.3	1630	1041	1750.9	002	845	1	
33	2	Pią	943	21.05040	-13.41	21.0432	-16.43	0.98557	3.3212	14.55	59.445	0.9	59	728	1159.4	1632	1104	1841.0	117	841	2	
34	3	Sob	944	21.09006	-13.48	21.0836	-16.26	0.98572	4.2720	18.31	58.506	1.9	70	726	1159.5	1634	1133	1935.4	234	837	3	
35	4	Nie	945	21.12571	-13.54	21.1238	-16.08	0.98587	5.2625	21.09	57.614	2.9	80	724	1159.6	1636	1211	2034.1	352	833	4	
36	5	Pon	946	21.16537	-13.59	21.1639	-15.50	0.98602	6.2859	22.30	56.845	3.9	88	723	1159.7	1638	1302	2136.3	506	829	5	
37	6	Wto	947	21.20502	-14.03	21.2040	-15.31	0.98618	7.3342	22.17	56.281	4.9	95	721	1159.8	1640	1408	2240.1	610	825	6	
38	7	Śro	948	21.24468	-14.06	21.2440	-15.13	0.98634	8.3834	20.27	55.984	5.9	99	719	1159.8	1641	1528	2343.0	702	822	7	
39	8	Czw	949	21.28433	-14.08	21.2839	-14.54	0.98651	9.4141	17.08	55.994	0.2	100	717	1159.9	1643	1654	*****	743	818	8	
40	9	Pią	950	21.32399	-14.10	21.3237	-14.34	0.98669	10.4153	12.40	56.314	1.2	98	715	1159.9	1645	1823	043.2	813	814	9	
41	10	Sob	951	21.36364	-14.11	21.3635	-14.15	0.98687	11.3851	7.30	56.910	2.2	93	713	1159.9	1647	1949	139.8	838	810	10	
42	11	Nie	952	21.40330	-14.11	21.4031	-13.55	0.98706	12.3259	2.02	57.720	3.2	86	711	1159.9	1649	2112	233.0	900	806	11	
43	12	Pon	953	21.44295	-14.11	21.4427	-13.35	0.98725	13.2503	-3.23	58.664	4.2	77	709	1159.9	1651	2233	323.5	919	802	12	
44	13	Wto	954	21.48261	-14.09	21.4822	-13.15	0.98744	14.1550	-8.27	59.659	5.2	67	707	1159.9	1653	2350	412.3	939	758	13	
45	14	Śro	955	21.52226	-14.07	21.5217	-12.55	0.98764	15.0608	-12.56	60.628	6.2	57	705	1159.9	1655	****	500.3	1000	754	14	
46	15	Czw	956	21.56192	-14.04	21.5611	-12.34	0.98785	15.5630	-16.43	61.510	0.3	47	703	1159.8	1657	104	548.2	1023	750	15	
47	16	Pią	957	22.00158	-14.01	22.0004	-12.14	0.98806	16.4717	-19.37	62.263	1.3	37	701	1159.8	1659	215	636.5	1051	746	16	
48	17	Sob	958	22.04123	-13.57	22.0356	-11.53	0.98827	17.3833	-21.36	62.861	2.3	28	659	1159.7	1701	321	725.3	1125	742	17	
49	18	Nie	959	22.08089	-13.52	22.0748	-11.31	0.98848	18.3005	-22.33	63.295	3.3	20	657	1159.6	1703	420	814.5	1207	738	18	
50	19	Pon	960	22.12054	-13.47	22.1139	-11.10	0.98870	19.2129	-22.29	63.569	4.3	13	655	1159.5	1705	511	903.6	1257	734	19	
51	20	Wto	961	22.16020	-13.40	22.1529	-10.49	0.98892	20.1215	-21.24	63.694	5.3	7	653	1159.4	1707	554	952.1	1354	730	20	
52	21	Śro	962	22.19585	-13.34	22.1919	-10.27	0.98914	21.0158	-19.24	63.688	6.3	3	651	1159.3	1709	628	1039.5	1457	726	21	
53	22	Czw	963	22.23551	-13.26	22.2308	-10.05	0.98936	21.5024	-16.33	63.568	7.3	1	649	1159.2	1711	655	1125.5	1603	723	22	
54	23	Pią	964	22.27516	-13.18	22.2657	-9.43	0.98959	22.3733	-13.00	63.351	0.1	0	646	1159.0	1713	718	1210.0	1712	719	23	
55	24	Sob	965	22.31482	-13.09	22.3045	-9.21	0.98981	23.2339	-8.54	63.048	1.1	1	644	1158.9	1714	737	1253.4	1820	715	24	
56	25	Nie	966	22.35448	-13.00	22.3432	-8.59	0.99004	0.0907	-4.24	62.666	2.1	4	642	1158.7	1716	755	1336.2	1930	711	25	
57	26	Pon	967	22.39413	-12.50	22.3819	-8.36	0.99027	0.5434	0.19	62.206	3.1	9	640	1158.6	1718	811	1418.9	2040	707	26	
58	27	Wto	968	22.43378	-12.40	22.4205	-8.14	0.99050	1.4043	5.06	61.668	4.1	15	638	1158.4	1720	828	1502.5	2152	703	27	
59	28	Śro	969	22.47344	-12.29	22.4550	-7.51	0.99074	2.2819	9.45	61.053	5.1	24	635	1158.2	1722	846	1547.9	2305	659	28	

Fazy Księżyca [Dm, h.mm]: 1kw 1, 15.02 Pełn 8, 8.12 3kw 15, 4.24 Nów 23, 9.21

LUTY 2001 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	5.30	18.30	7.59	18.13	8.45	20.60	1.58	10.48	10.58	2.57	10.49	2.09	7.53	17.09	7.17	15.53	3.02	12.55		
	21.008	-17.01	22.116	-10.34	23.888	0.92	15.381	-17.40	3.953	19.75	3.484	16.81	21.532	-15.34	20.591	-18.48	16.971	-12.14	8.75105	1
3	5.27	18.34	7.49	18.11	8.38	21.03	1.57	10.43	10.50	2.49	10.42	2.02	7.46	17.02	7.09	15.45	2.54	12.47		
	21.143	-16.43	22.139	-9.60	23.987	1.86	15.455	-17.68	3.957	19.77	3.486	16.83	21.540	-15.31	20.596	-18.46	16.975	-12.13	8.88247	3
5	5.24	18.37	7.37	18.04	8.31	21.06	1.55	10.38	10.42	2.42	10.34	1.54	7.38	16.55	7.02	15.38	2.46	12.40		
	21.278	-15.83	22.117	-9.13	0.083	2.78	15.529	-17.96	3.961	19.79	3.489	16.85	21.547	-15.27	20.601	-18.45	16.978	-12.13	9.01390	5
7	5.21	18.40	7.24	17.53	8.23	21.08	1.53	10.32	10.35	2.35	10.26	1.46	7.31	16.47	6.54	15.31	2.39	12.32		
	21.411	-15.21	22.050	-8.95	0.175	3.69	15.602	-18.23	3.967	19.82	3.492	16.87	21.555	-15.23	20.606	-18.43	16.981	-12.13	9.14532	7
9	5.18	18.44	7.10	17.38	8.16	21.10	1.51	10.27	10.27	2.27	10.18	1.39	7.23	16.40	6.46	15.23	2.31	12.24		
	21.544	-14.57	21.943	-9.08	0.263	4.58	15.675	-18.49	3.973	19.85	3.495	16.89	21.562	-15.19	20.611	-18.41	16.983	-12.13	9.27674	9
11	5.15	18.47	6.57	17.20	8.08	21.12	1.49	10.22	10.19	2.20	10.10	1.32	7.15	16.33	6.39	15.16	2.23	12.17		
	21.675	-13.92	21.809	-9.47	0.348	5.45	15.748	-18.74	3.981	19.87	3.499	16.91	21.570	-15.16	20.616	-18.39	16.986	-12.12	9.40815	11
13	5.11	18.51	6.43	16.60	8.01	21.14	1.48	10.17	10.12	2.13	10.03	1.24	7.08	16.26	6.31	15.08	2.15	12.09		
	21.806	-13.25	21.660	-10.09	0.428	6.30	15.820	-18.99	3.989	19.91	3.504	16.94	21.578	-15.12	20.621	-18.37	16.989	-12.12	9.53957	13
15	5.08	18.54	6.31	16.39	7.53	21.15	1.46	10.12	10.04	2.06	9.55	1.17	7.00	16.19	6.23	15.01	2.08	12.01		
	21.936	-12.57	21.513	-10.84	0.503	7.12	15.892	-19.23	3.998	19.94	3.509	16.97	21.585	-15.08	20.626	-18.35	16.991	-12.11	9.67099	15
17	5.04	18.58	6.20	16.19	7.45	21.16	1.44	10.07	9.57	1.59	9.47	1.09	6.52	16.11	6.15	14.53	1.60	11.54		
	22.066	-11.88	21.381	-11.64	0.573	7.92	15.964	-19.46	4.008	19.98	3.514	16.99	21.593	-15.05	20.631	-18.34	16.993	-12.11	9.80241	17
19	4.60	19.01	6.10	16.00	7.37	21.16	1.42	10.02	9.49	1.52	9.39	1.02	6.45	16.04	6.08	14.46	1.52	11.46		
	22.194	-11.17	21.275	-12.42	0.638	8.68	16.035	-19.69	4.019	20.02	3.520	17.02	21.600	-15.01	20.636	-18.32	16.995	-12.10	9.93383	19
21	4.56	19.05	6.02	15.44	7.28	21.16	1.39	9.56	9.42	1.45	9.32	0.55	6.37	15.57	6.00	14.38	1.44	11.38		
	22.322	-10.45	21.200	-13.13	0.698	9.42	16.106	-19.90	4.031	20.06	3.527	17.06	21.608	-14.97	20.641	-18.30	16.997	-12.10	10.06525	21
23	4.52	19.09	5.55	15.30	7.20	21.15	1.37	9.51	9.34	1.38	9.24	0.48	6.30	15.50	5.52	14.31	1.37	11.30		
	22.449	-9.72	21.159	-13.75	0.751	10.11	16.177	-20.11	4.043	20.10	3.534	17.09	21.615	-14.94	20.646	-18.28	16.999	-12.09	10.19667	23
25	4.47	19.12	5.50	15.18	7.11	21.14	1.35	9.46	9.27	1.31	9.16	0.40	6.22	15.43	5.45	14.23	1.29	11.23		
	22.576	-8.98	21.150	-14.24	0.797	10.76	16.247	-20.32	4.056	20.14	3.541	17.13	21.623	-14.90	20.650	-18.27	17.001	-12.09	10.32808	25
27	4.43	19.16	5.45	15.09	7.02	21.12	1.32	9.41	9.20	1.25	9.09	0.33	6.14	15.35	5.37	14.16	1.21	11.15		
	22.701	-8.23	21.170	-14.62	0.836	11.37	16.316	-20.51	4.070	20.19	3.549	17.16	21.630	-14.87	20.655	-18.25	17.002	-12.08	10.45950	27

MARZEC 2001

Piwnice, CA UMK				← Dane na godz. 12 czasu strefowego (= 11 lub 10 ^h UT) →										Czas strefowy [hhmm.]								
..... Dzień				ST	Δα	α _☉	δ _☉	R _☉	α _☾	δ _☾	R _☾	Faza ☾	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ _☉	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2451																			
60	1	Czw	970	22.51309	-12.17	22.4935	-7.28	0.99097	3.1811	14.03	60.369	6.1	33	633	1158.0	1724	907	1635.8	****	655	1	
61	2	Pią	971	22.55275	-12.05	22.5320	-7.05	0.99121	4.1059	17.46	59.629	7.1	43	631	1157.8	1726	933	1727.1	021	651	2	
62	3	Sob	972	22.59241	-11.53	22.5704	-6.42	0.99145	5.0707	20.38	58.861	0.4	54	628	1157.6	1728	1006	1822.2	136	647	3	
63	4	Nie	973	23.03206	-11.40	23.0048	-6.19	0.99170	6.0631	22.22	58.108	1.4	65	626	1157.4	1730	1049	1920.7	250	643	4	
64	5	Pon	974	23.07172	-11.26	23.0431	-5.56	0.99194	7.0822	22.42	57.425	2.4	76	624	1157.2	1731	1147	2021.6	356	639	5	
65	6	Wto	975	23.11137	-11.13	23.0813	-5.33	0.99219	8.1118	21.31	56.874	3.4	85	622	1157.0	1733	1258	2123.1	451	635	6	
66	7	Śro	976	23.15103	-10.58	23.1156	-5.10	0.99245	9.1343	18.51	56.519	4.4	92	619	1156.7	1735	1420	2223.4	535	631	7	
67	8	Czw	977	23.19068	-10.43	23.1537	-4.46	0.99271	10.1420	14.52	56.409	5.4	98	617	1156.5	1737	1547	2321.2	610	628	8	
68	9	Pią	978	23.23034	-10.28	23.1919	-4.23	0.99297	11.1231	9.57	56.571	6.4	100	615	1156.2	1739	1715	*****	637	624	9	
69	10	Sob	979	23.26599	-10.13	23.2260	-3.59	0.99323	12.0817	4.28	57.002	0.7	99	612	1156.0	1741	1841	016.3	700	620	10	
70	11	Nie	980	23.30565	-9.57	23.2641	-3.36	0.99350	13.0208	-1.10	57.667	1.7	96	610	1155.7	1743	2005	108.9	720	616	11	
71	12	Pon	981	23.34530	-9.41	23.3021	-3.12	0.99377	13.5443	-6.35	58.506	2.7	90	607	1155.4	1744	2126	159.7	740	612	12	
72	13	Wto	982	23.38496	-9.25	23.3401	-2.48	0.99404	14.4640	-11.30	59.444	3.7	82	605	1155.2	1746	2245	249.5	800	608	13	
73	14	Śro	983	23.42461	-9.08	23.3741	-2.25	0.99432	15.3831	-15.42	60.403	4.7	73	603	1154.9	1748	****	339.1	823	604	14	
74	15	Czw	984	23.46427	-8.51	23.4121	-2.01	0.99459	16.3033	-19.00	61.311	5.7	64	600	1154.6	1750	000	428.8	850	600	15	
75	16	Pią	985	23.50392	-8.34	23.4501	-1.37	0.99487	17.2250	-21.20	62.106	6.7	54	558	1154.3	1752	110	518.7	922	556	16	
76	17	Sob	986	23.54358	-8.17	23.4840	-1.14	0.99516	18.1508	-22.36	62.748	0.6	44	556	1154.0	1754	214	608.8	1002	552	17	
77	18	Nie	987	23.58324	-7.60	23.5219	-0.50	0.99544	19.0706	-22.49	63.210	1.6	35	553	1153.7	1755	308	658.6	1049	548	18	
78	19	Pon	988	0.02289	-7.42	23.5558	-0.26	0.99572	19.5817	-21.59	63.483	2.6	26	551	1153.4	1757	354	747.6	1144	544	19	
79	20	Wto	989	0.06255	-7.24	23.5937	-0.02	0.99601	20.4821	-20.11	63.572	3.6	18	548	1153.2	1759	430	835.5	1246	540	20	
80	21	Śro	990	0.10220	-7.07	0.0316	0.21	0.99629	21.3706	-17.31	63.496	4.6	12	546	1152.9	1801	500	921.9	1352	536	21	
81	22	Czw	991	0.14186	-6.49	0.0654	0.45	0.99658	22.2435	-14.07	63.278	5.6	6	544	1152.6	1803	523	1006.9	1500	532	22	
82	23	Pią	992	0.18151	-6.31	0.1033	1.09	0.99686	23.1102	-10.06	62.948	6.6	2	541	1152.3	1804	544	1050.8	1609	529	23	
83	24	Sob	993	0.22117	-6.13	0.1411	1.32	0.99715	23.5652	-5.37	62.535	7.6	0	539	1152.0	1806	601	1133.8	1719	525	24	
84	25	Nie	994	0.26082	-5.55	0.1750	1.56	0.99743	0.4239	-0.51	62.066	0.4	0	536	1151.7	1808	618	1217.1	1830	521	25	
84	25	Nie	994	23.25583	-5.55	0.1741	1.55	0.99742	0.4044	-1.03	62.086	0.4	0	636	1251.7	1908	718	1317.0	1930	621	25	
85	26	Pon	995	23.29549	-5.37	0.2119	2.18	0.99770	1.2705	3.50	61.582	1.4	2	634	1251.4	1910	734	1400.8	2042	617	26	
86	27	Wto	996	23.33515	-5.19	0.2458	2.42	0.99798	2.1441	8.38	61.058	2.4	6	632	1251.1	1912	752	1446.0	2156	613	27	
87	28	Śro	997	23.37480	-5.01	0.2836	3.05	0.99826	3.0414	13.08	60.521	3.4	11	629	1250.8	1913	812	1533.4	2312	609	28	
88	29	Czw	998	23.41446	-4.43	0.3215	3.29	0.99854	3.5621	17.05	59.978	4.4	19	627	1250.5	1915	835	1623.8	****	605	29	
89	30	Pią	999	23.45411	-4.25	0.3553	3.52	0.99882	4.5120	20.12	59.435	5.4	28	624	1250.2	1917	905	1717.3	028	601	30	
90	31	Sob	000	23.49377	-4.07	0.3932	4.15	0.99910	5.4908	22.15	58.899	6.4	39	622	1249.9	1919	944	1813.9	142	557	31	

Fazy Księżyca [Dm, h.mm]: 1kw 3, 3.03 Pełn 9, 18.23 3kw 16, 21.45 Nów 25, 2.21 Nów 25, 3.21

MARZEC 2001 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm])
 oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet
 w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.39	19.20	5.42	15.03	6.52	21.09	1.30	9.36	9.12	1.18	9.01	0.26	6.07	15.28	5.29	14.09	1.13	11.07		
	22.827	-7.47	21.217	-14.87	0.867	11.92	16.385	-20.70	4.085	20.24	3.557	17.20	21.637	-14.83	20.659	-18.23	17.004	-12.07	10.59092	1
3	4.34	19.24	5.39	14.58	6.43	21.05	1.27	9.31	9.05	1.12	8.54	0.19	5.59	15.21	5.22	14.01	1.05	10.59		
	22.951	-6.70	21.287	-15.00	0.889	12.42	16.453	-20.88	4.101	20.29	3.565	17.24	21.644	-14.79	20.664	-18.22	17.005	-12.07	10.72234	3
5	4.29	19.27	5.36	14.56	6.33	21.01	1.25	9.26	8.58	1.05	8.46	0.12	5.51	15.14	5.14	13.54	0.57	10.52		
	23.075	-5.93	21.376	-15.01	0.903	12.86	16.520	-21.05	4.117	20.34	3.575	17.28	21.652	-14.76	20.668	-18.20	17.006	-12.06	10.85376	5
7	4.24	19.31	5.34	14.55	6.24	20.55	1.22	9.21	8.51	0.59	8.38	0.05	5.44	15.07	5.06	13.46	0.50	10.44		
	23.199	-5.16	21.483	-14.90	0.908	13.22	16.587	-21.22	4.134	20.39	3.584	17.32	21.659	-14.72	20.672	-18.19	17.007	-12.05	10.98518	7
9	4.20	19.35	5.32	14.56	6.14	20.49	1.19	9.16	8.43	0.52	8.31	23.54	5.36	14.59	4.58	13.39	0.42	10.36		
	23.322	-4.38	21.604	-14.69	0.903	13.51	16.653	-21.38	4.152	20.44	3.594	17.36	21.666	-14.69	20.677	-18.17	17.008	-12.04	11.11660	9
11	4.15	19.39	5.30	14.58	6.04	20.41	1.16	9.11	8.36	0.46	8.23	23.47	5.28	14.52	4.51	13.31	0.34	10.28		
	23.445	-3.59	21.737	-14.37	0.888	13.72	16.718	-21.53	4.170	20.50	3.604	17.41	21.673	-14.66	20.681	-18.15	17.008	-12.04	11.24801	11
13	4.09	19.43	5.29	15.01	5.54	20.33	1.13	9.06	8.29	0.39	8.16	23.40	5.21	14.45	4.43	13.23	0.26	10.21		
	23.567	-2.81	21.880	-13.95	0.864	13.85	16.782	-21.68	4.189	20.56	3.615	17.45	21.679	-14.62	20.685	-18.14	17.009	-12.03	11.37943	13
15	4.04	19.47	5.27	15.05	5.44	20.23	1.10	9.01	8.22	0.33	8.08	23.33	5.13	14.38	4.35	13.16	0.18	10.13		
	23.689	-2.02	22.032	-13.43	0.830	13.88	16.845	-21.82	4.209	20.61	3.626	17.50	21.686	-14.59	20.689	-18.13	17.009	-12.02	11.51085	15
17	3.59	19.52	5.25	15.10	5.34	20.12	1.07	8.56	8.15	0.27	8.01	23.26	5.05	14.30	4.28	13.08	0.10	10.05		
	23.811	-1.23	22.192	-12.81	0.787	13.81	16.908	-21.96	4.229	20.67	3.637	17.54	21.693	-14.56	20.692	-18.11	17.009	-12.01	11.64227	17
19	3.54	19.56	5.23	15.17	5.24	20.00	1.04	8.51	8.08	0.21	7.53	23.19	4.58	14.23	4.20	13.01	0.02	9.57		
	23.933	-0.44	22.359	-12.11	0.735	13.64	16.969	-22.09	4.250	20.73	3.649	17.59	21.699	-14.52	20.696	-18.10	17.009	-12.00	11.77369	19
21	3.48	20.00	5.21	15.24	5.14	19.47	1.01	8.45	8.01	0.15	7.46	23.13	4.50	14.16	4.12	12.53	23.50	9.49		
	0.054	0.35	22.531	-11.31	0.676	13.37	17.029	-22.21	4.271	20.79	3.661	17.64	21.706	-14.49	20.700	-18.08	17.009	-11.99	11.90511	21
23	3.43	20.05	5.19	15.31	5.04	19.33	0.57	8.40	7.54	0.08	7.38	23.06	4.42	14.08	4.04	12.46	23.43	9.42		
	0.176	1.14	22.709	-10.43	0.611	13.00	17.088	-22.33	4.294	20.85	3.673	17.69	21.712	-14.46	20.703	-18.07	17.009	-11.98	12.03652	23
25	3.37	20.09	5.16	15.40	4.55	19.19	0.54	8.35	7.47	0.02	7.31	22.59	4.35	14.01	3.57	12.38	23.35	9.34		
	0.297	1.93	22.891	-9.46	0.541	12.54	17.146	-22.45	4.316	20.91	3.686	17.74	21.718	-14.43	20.706	-18.06	17.009	-11.97	12.16794	25
25	4.37	21.09	6.16	16.40	5.55	20.19	1.54	9.35	8.47	1.02	8.31	0.03	5.35	15.01	4.57	13.38	0.39	10.34		
	0.295	1.91	22.888	-9.48	0.543	12.55	17.145	-22.45	4.316	20.91	3.686	17.74	21.718	-14.43	20.706	-18.06	17.009	-11.98	12.16794	25
27	4.31	21.14	6.14	16.49	5.46	20.03	1.50	9.30	8.40	0.56	8.24	23.52	5.27	14.54	4.49	13.30	0.31	10.26		
	0.416	2.70	23.074	-8.43	0.470	12.01	17.201	-22.56	4.339	20.97	3.699	17.79	21.724	-14.40	20.709	-18.05	17.008	-11.97	12.29935	27
29	4.25	21.18	6.11	16.58	5.37	19.48	1.46	9.24	8.33	0.50	8.16	23.45	5.19	14.46	4.41	13.23	0.23	10.18		
	0.537	3.48	23.266	-7.30	0.397	11.39	17.256	-22.66	4.363	21.03	3.712	17.84	21.730	-14.37	20.713	-18.04	17.007	-11.96	12.43077	29
31	4.19	21.23	6.08	17.09	5.29	19.31	1.42	9.19	8.26	0.44	8.09	23.39	5.12	14.39	4.33	13.15	0.15	10.10		
	0.659	4.26	23.461	-6.09	0.325	10.71	17.309	-22.77	4.387	21.10	3.726	17.89	21.736	-14.35	20.716	-18.02	17.006	-11.95	12.56219	31

KWIECIEŃ 2001

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2452																		
91	1	Nie	001	23.53342	-3.49	0.4310	4.38	0.99938	6.4907	23.00	58.388	7.4	50	620	1249.6	1921	1036	1912.7	250	553	1
92	2	Pon	002	23.57308	-3.31	0.4649	5.02	0.99966	7.5007	22.19	57.925	1.0	61	617	1249.3	1922	1140	2012.1	347	549	2
93	3	Wto	003	0.01273	-3.13	0.5028	5.25	0.99995	8.5052	20.12	57.547	2.0	72	615	1249.0	1924	1256	2110.8	434	545	3
94	4	Śro	004	0.05239	-2.56	0.5407	5.47	1.00023	9.5014	16.46	57.291	3.0	82	612	1248.7	1926	1419	2207.7	510	541	4
95	5	Czw	005	0.09204	-2.39	0.5746	6.10	1.00051	10.4739	12.16	57.197	4.0	90	610	1248.4	1928	1545	2302.2	538	537	5
96	6	Pią	006	0.13170	-2.21	1.0125	6.33	1.00079	11.4306	7.03	57.297	5.0	96	608	1248.1	1930	1710	2354.8	601	533	6
97	7	Sob	007	0.17135	-2.04	1.0505	6.56	1.00108	12.3656	1.28	57.602	6.0	99	605	1247.8	1931	1835	*****	622	530	7
98	8	Nie	008	0.21101	-1.47	1.0845	7.18	1.00136	13.2947	-4.08	58.106	0.3	100	603	1247.5	1933	1958	045.8	641	526	8
99	9	Pon	009	0.25066	-1.31	1.1225	7.40	1.00165	14.2215	-9.25	58.778	1.3	98	601	1247.3	1935	2119	136.2	701	522	9
100	10	Wto	010	0.29032	-1.15	1.1605	8.03	1.00193	15.1451	-14.05	59.566	2.3	94	558	1247.0	1937	2238	226.4	722	518	10
101	11	Śro	011	0.32597	-0.59	1.1946	8.25	1.00222	16.0751	-17.55	60.409	3.3	87	556	1246.7	1939	2352	317.0	747	514	11
102	12	Czw	012	0.36563	-0.43	1.2326	8.47	1.00251	17.0115	-20.45	61.240	4.3	80	554	1246.5	1940	****	408.1	817	510	12
103	13	Pią	013	0.40529	-0.27	1.2708	9.08	1.00280	17.5445	-22.30	61.996	5.3	71	551	1246.2	1942	101	459.4	854	506	13
104	14	Sob	014	0.44494	-0.12	1.3049	9.30	1.00309	18.4752	-23.07	62.624	6.3	62	549	1246.0	1944	201	550.5	939	502	14
105	15	Nie	015	0.48460	0.02	1.3431	9.51	1.00337	19.4005	-22.39	63.083	7.3	52	547	1245.7	1946	251	640.7	1032	458	15
106	16	Pon	016	0.52425	0.17	1.3813	10.13	1.00366	20.3057	-21.10	63.351	0.8	43	545	1245.5	1947	331	729.6	1132	454	16
107	17	Wto	017	0.56391	0.31	1.4156	10.34	1.00394	21.2017	-18.46	63.418	1.8	34	542	1245.2	1949	403	816.7	1237	450	17
108	18	Śro	018	1.00356	0.44	1.4539	10.55	1.00423	22.0808	-15.35	63.293	2.8	25	540	1245.0	1951	429	902.2	1344	446	18
109	19	Czw	019	1.04322	0.57	1.4922	11.16	1.00451	22.5446	-11.44	62.995	3.8	17	538	1244.8	1953	450	946.3	1453	442	19
110	20	Pią	020	1.08287	1.10	1.5306	11.36	1.00478	23.4040	-7.22	62.558	4.8	10	536	1244.6	1955	508	1029.6	1603	438	20
111	21	Sob	021	1.12253	1.22	1.5650	11.57	1.00506	0.2626	-2.37	62.021	5.8	5	534	1244.4	1956	524	1112.6	1714	435	21
112	22	Nie	022	1.16218	1.34	2.0035	12.17	1.00533	1.1246	2.20	61.426	6.8	2	531	1244.2	1958	540	1156.3	1827	431	22
113	23	Pon	023	1.20184	1.45	2.0420	12.37	1.00560	2.0025	7.17	60.816	7.8	0	529	1244.0	2000	557	1241.4	1942	427	23
114	24	Wto	024	1.24149	1.56	2.0806	12.57	1.00587	2.5004	12.01	60.225	0.8	1	527	1243.8	2002	616	1328.7	2058	423	24
115	25	Śro	025	1.28115	2.06	2.1152	13.16	1.00613	3.4220	16.15	59.684	1.8	4	525	1243.6	2004	638	1419.0	2216	419	25
116	26	Czw	026	1.32081	2.16	2.1539	13.36	1.00639	4.3733	19.43	59.209	2.8	9	523	1243.5	2005	706	1512.5	2333	415	26
117	27	Pią	027	1.36046	2.26	2.1926	13.55	1.00665	5.3533	22.07	58.808	3.8	16	521	1243.3	2007	742	1609.1	****	411	27
118	28	Sob	028	1.40012	2.35	2.2314	14.14	1.00691	6.3538	23.12	58.483	4.8	25	519	1243.2	2009	830	1707.8	045	407	28
119	29	Nie	029	1.43577	2.43	2.2702	14.33	1.00716	7.3633	22.51	58.230	5.8	35	517	1243.0	2011	931	1807.1	146	403	29
120	30	Pon	030	1.47543	2.51	2.3050	14.51	1.00741	8.3655	21.04	58.050	6.8	47	515	1242.9	2012	1043	1905.4	235	359	30

Fazy Księżyca [Dm, h.mm]: 1kw 1, 12.49 Pełn 8, 5.22 3kw 15, 17.31 Nów 23, 17.26 1kw 30, 19.08

KWIECIEŃ 2001 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE			MERCURY			WENUS			MARS			JOWISZ			SATURN			URAN			NEPTUN			PLUTON			ST (0^h UT) Dm	
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach			
1	4.16	21.26	6.07	17.14	5.25	19.23	1.40	9.16	8.23	0.41	8.05	23.35	5.08	14.35	4.29	13.11	0.11	10.06											
	0.720	4.64	23.560	-5.46	0.290	10.35	17.336	-22.82	4.399	21.13	3.733	17.91	21.738	-14.33	20.717	-18.02	17.006	-11.94	12.62790	1									
3	4.10	21.31	6.04	17.26	5.17	19.07	1.36	9.11	8.16	0.35	7.58	23.29	5.00	14.28	4.22	13.04	0.03	9.58											
	0.841	5.41	23.762	-4.14	0.223	9.61	17.387	-22.91	4.424	21.19	3.747	17.97	21.744	-14.31	20.720	-18.01	17.005	-11.93	12.75932	3									
5	4.04	21.36	6.01	17.37	5.10	18.51	1.32	9.05	8.09	0.30	7.50	23.22	4.52	14.21	4.14	12.56	23.51	9.50											
	0.963	6.17	23.969	-2.75	0.162	8.85	17.436	-23.01	4.450	21.25	3.761	18.02	21.749	-14.28	20.722	-18.00	17.004	-11.92	12.89074	5									
7	3.58	21.41	5.58	17.50	5.03	18.36	1.28	8.59	8.02	0.24	7.43	23.15	4.45	14.13	4.06	12.49	23.43	9.43											
	1.085	6.93	0.180	-1.29	0.108	8.09	17.484	-23.10	4.476	21.31	3.776	18.07	21.755	-14.25	20.725	-17.99	17.002	-11.91	13.02216	7									
9	3.51	21.46	5.55	18.03	4.57	18.21	1.23	8.54	7.56	0.18	7.36	23.09	4.37	14.06	3.58	12.41	23.35	9.35											
	1.207	7.67	0.396	0.24	0.062	7.35	17.530	-23.19	4.502	21.38	3.791	18.13	21.760	-14.23	20.727	-17.98	17.001	-11.90	13.15357	9									
11	3.45	21.52	5.52	18.17	4.51	18.08	1.19	8.48	7.49	0.12	7.28	23.02	4.29	13.58	3.51	12.33	23.27	9.27											
	1.329	8.41	0.618	1.83	0.026	6.64	17.574	-23.28	4.529	21.44	3.806	18.18	21.764	-14.21	20.729	-17.97	16.999	-11.89	13.28499	11									
13	3.38	21.57	5.49	18.32	4.45	17.55	1.14	8.42	7.42	0.06	7.21	22.56	4.22	13.51	3.43	12.25	23.19	9.19											
	1.452	9.14	0.846	3.47	23.999	5.98	17.616	-23.37	4.556	21.50	3.822	18.23	21.769	-14.18	20.732	-17.96	16.998	-11.89	13.41641	13									
15	3.32	22.03	5.46	18.47	4.39	17.42	1.09	8.36	7.36	23.57	7.14	22.49	4.14	13.43	3.35	12.18	23.11	9.11											
	1.575	9.86	1.080	5.17	23.983	5.37	17.656	-23.45	4.583	21.56	3.837	18.29	21.774	-14.16	20.733	-17.96	16.996	-11.88	13.54783	15									
17	3.25	22.09	5.43	19.03	4.34	17.31	1.04	8.29	7.29	23.51	7.07	22.43	4.06	13.36	3.27	12.10	23.03	9.03											
	1.699	10.57	1.321	6.90	23.976	4.83	17.694	-23.54	4.611	21.62	3.853	18.34	21.778	-14.14	20.735	-17.95	16.994	-11.87	13.67925	17									
19	3.18	22.15	5.40	19.20	4.29	17.21	0.59	8.23	7.22	23.45	6.59	22.36	3.58	13.29	3.19	12.02	22.55	8.55											
	1.823	11.26	1.568	8.67	23.980	4.35	17.729	-23.63	4.640	21.68	3.869	18.40	21.782	-14.12	20.737	-17.94	16.992	-11.86	13.81067	19									
21	3.11	22.22	5.38	19.37	4.24	17.12	0.54	8.16	7.16	23.39	6.52	22.29	3.51	13.21	3.12	11.55	22.47	8.47											
	1.947	11.95	1.823	10.44	23.993	3.94	17.762	-23.71	4.668	21.74	3.885	18.45	21.786	-14.10	20.738	-17.94	16.989	-11.85	13.94208	21									
23	3.03	22.29	5.35	19.55	4.19	17.03	0.48	8.10	7.09	23.34	6.45	22.23	3.43	13.13	3.04	11.47	22.38	8.39											
	2.072	12.62	2.085	12.22	0.015	3.61	17.792	-23.80	4.697	21.80	3.902	18.51	21.790	-14.08	20.740	-17.93	16.987	-11.84	14.07350	23									
25	2.56	22.36	5.33	20.14	4.15	16.56	0.43	8.03	7.03	23.28	6.38	22.16	3.35	13.06	2.56	11.39	22.30	8.31											
	2.198	13.27	2.353	13.96	0.046	3.34	17.820	-23.89	4.727	21.86	3.918	18.56	21.794	-14.06	20.741	-17.93	16.985	-11.83	14.20492	25									
27	2.48	22.43	5.31	20.32	4.10	16.49	0.37	7.56	6.56	23.22	6.30	22.10	3.27	12.58	2.48	11.31	22.22	8.23											
	2.324	13.92	2.626	15.66	0.086	3.14	17.844	-23.98	4.756	21.92	3.935	18.61	21.797	-14.05	20.742	-17.92	16.982	-11.82	14.33634	27									
29	2.40	22.51	5.30	20.51	4.06	16.44	0.31	7.48	6.50	23.17	6.23	22.03	3.20	12.51	2.40	11.24	22.14	8.15											
	2.450	14.54	2.902	17.27	0.132	3.01	17.866	-24.07	4.786	21.98	3.952	18.67	21.801	-14.03	20.743	-17.92	16.979	-11.81	14.46776	29									

MAJ 2001

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2452																					
121	1	Wto	031	1.51508	2.59	2.3439	15.09	1.00765	9.3537	17.58	57.944	0.7	58	513	1242.8	2014	1203	2001.6	313	355	1
122	2	Śro	032	1.55474	3.06	2.3829	15.27	1.00790	10.3209	13.48	57.923	1.7	69	511	1242.7	2016	1326	2055.4	343	351	2
123	3	Czw	033	1.59439	3.12	2.4219	15.45	1.00814	11.2632	8.51	58.000	2.7	79	509	1242.5	2018	1449	2146.9	407	347	3
124	4	Pią	034	2.03405	3.18	2.4610	16.02	1.00839	12.1916	3.27	58.189	3.7	88	507	1242.5	2019	1612	2236.8	427	343	4
125	5	Sob	035	2.07370	3.23	2.5001	16.20	1.00863	13.1102	-2.06	58.501	4.7	94	505	1242.4	2021	1733	2326.1	446	339	5
126	6	Nie	036	2.11336	3.28	2.5353	16.36	1.00886	14.0234	-7.29	58.938	5.7	98	503	1242.3	2023	1854	*****	504	336	6
127	7	Pon	037	2.15301	3.32	2.5745	16.53	1.00910	14.5429	-12.25	59.489	6.7	100	501	1242.2	2025	2014	015.4	524	332	7
128	8	Wto	038	2.19267	3.36	3.0138	17.09	1.00934	15.4710	-16.38	60.128	0.8	99	459	1242.2	2026	2131	105.5	547	328	8
129	9	Śro	039	2.23233	3.39	3.0532	17.26	1.00957	16.4041	-19.56	60.817	1.8	96	457	1242.1	2028	2244	156.4	614	324	9
130	10	Czw	040	2.27198	3.41	3.0926	17.41	1.00981	17.3446	-22.09	61.509	2.8	91	456	1242.1	2030	2349	248.2	647	320	10
131	11	Pią	041	2.31164	3.43	3.1321	17.57	1.01004	18.2850	-23.13	62.152	3.8	85	454	1242.0	2031	****	340.2	729	316	11
132	12	Sob	042	2.35129	3.44	3.1716	18.12	1.01027	19.2209	-23.09	62.695	4.8	77	452	1242.0	2033	045	431.7	819	312	12
133	13	Nie	043	2.39095	3.45	3.2112	18.27	1.01050	20.1405	-22.00	63.096	5.8	69	450	1242.0	2035	130	521.8	917	308	13
134	14	Pon	044	2.43061	3.45	3.2508	18.41	1.01072	21.0417	-19.53	63.322	6.8	60	449	1242.0	2036	205	610.1	1021	304	14
135	15	Wto	045	2.47026	3.45	3.2905	18.56	1.01094	21.5240	-16.56	63.351	7.8	50	447	1242.0	2038	233	656.4	1128	300	15
136	16	Śro	046	2.50592	3.44	3.3303	19.10	1.01116	22.3929	-13.17	63.179	1.0	41	446	1242.0	2040	255	740.9	1236	256	16
137	17	Czw	047	2.54557	3.42	3.3701	19.23	1.01138	23.2516	-9.05	62.817	2.0	31	444	1242.0	2041	314	824.1	1345	252	17
138	18	Pią	048	2.58523	3.40	3.4060	19.36	1.01159	0.1038	-4.27	62.289	3.0	23	443	1242.1	2043	331	906.8	1456	248	18
139	19	Sob	049	3.02488	3.37	3.4459	19.49	1.01180	0.5622	0.27	61.635	4.0	15	441	1242.1	2044	347	949.8	1607	244	19
140	20	Nie	050	3.06454	3.34	3.4859	20.02	1.01200	1.4319	5.27	60.905	5.0	8	440	1242.2	2046	403	1033.9	1721	240	20
141	21	Pon	051	3.10419	3.30	3.5259	20.14	1.01220	2.3218	10.21	60.153	6.0	3	438	1242.2	2047	420	1120.3	1837	237	21
142	22	Wto	052	3.14385	3.26	3.5700	20.26	1.01239	3.2406	14.53	59.437	7.0	1	437	1242.3	2049	441	1209.8	1956	233	22
143	23	Śro	053	3.18350	3.21	4.0102	20.38	1.01258	4.1913	18.45	58.809	0.3	0	436	1242.4	2050	506	1303.0	2116	229	23
144	24	Czw	054	3.22316	3.15	4.0504	20.49	1.01276	5.1739	21.36	58.306	1.3	2	434	1242.5	2052	539	1359.8	2232	225	24
145	25	Pią	055	3.26282	3.09	4.0906	20.60	1.01294	6.1843	23.10	57.953	2.3	7	433	1242.6	2053	623	1459.5	2340	221	25
146	26	Sob	056	3.30247	3.03	4.1309	21.10	1.01311	7.2101	23.14	57.755	3.3	14	432	1242.7	2054	720	1600.4	****	217	26
147	27	Nie	057	3.34213	2.56	4.1713	21.20	1.01328	8.2250	21.46	57.703	4.3	23	431	1242.8	2056	831	1700.4	035	213	27
148	28	Pon	058	3.38179	2.49	4.2117	21.30	1.01344	9.2245	18.56	57.779	5.3	33	430	1242.9	2057	950	1758.0	117	209	28
149	29	Wto	059	3.42144	2.41	4.2521	21.39	1.01360	10.1958	14.58	57.958	6.3	44	429	1243.1	2058	1113	1852.5	149	205	29
150	30	Śro	060	3.46110	2.33	4.2926	21.48	1.01376	11.1428	10.11	58.219	0.5	56	428	1243.2	2100	1236	1944.1	214	201	30
151	31	Czw	061	3.50075	2.24	4.3331	21.57	1.01391	12.0646	4.55	58.546	1.5	67	427	1243.3	2101	1358	2033.5	235	157	31

Fazy Księżyca [Dm, h.mm]: 1kw 0, 19.08 Pełn 7, 15.53 3kw 15, 12.11 Nów 23, 4.46 1kw 30, 0.09

MAJ 2001 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	2.32	22.59	5.28	21.10	4.02	16.39	0.25	7.41	6.43	23.11	6.16	21.57	3.12	12.43	2.32	11.16	22.06	8.07		
	2.578	15.16	3.179	18.78	0.186	2.94	17.885	-24.16	4.817	22.04	3.969	18.72	21.804	-14.02	20.744	-17.92	16.977	-11.80	14.59918	1
3	2.23	23.07	5.27	21.28	3.57	16.34	0.19	7.33	6.37	23.06	6.09	21.50	3.04	12.36	2.25	11.08	21.58	7.59		
	2.705	15.75	3.454	20.15	0.246	2.94	17.901	-24.26	4.847	22.09	3.986	18.78	21.806	-14.00	20.744	-17.92	16.974	-11.80	14.73060	3
5	2.13	23.17	5.27	21.45	3.53	16.31	0.13	7.25	6.30	22.60	6.02	21.44	2.56	12.28	2.17	11.00	21.50	7.51		
	2.834	16.33	3.725	21.37	0.313	2.99	17.913	-24.36	4.878	22.15	4.003	18.83	21.809	-13.99	20.745	-17.91	16.971	-11.79	14.86202	5
7	2.03	23.27	5.27	22.01	3.49	16.28	0.06	7.17	6.24	22.54	5.54	21.38	2.49	12.20	2.09	10.52	21.42	7.43		
	2.963	16.89	3.988	22.43	0.385	3.10	17.922	-24.46	4.909	22.20	4.021	18.88	21.812	-13.98	20.745	-17.91	16.968	-11.78	14.99343	7
9	1.52	23.38	5.27	22.15	3.45	16.25	23.56	7.09	6.18	22.49	5.47	21.31	2.41	12.13	2.01	10.44	21.34	7.35		
	3.092	17.43	4.242	23.33	0.462	3.26	17.928	-24.57	4.940	22.25	4.038	18.94	21.814	-13.97	20.745	-17.91	16.965	-11.77	15.12486	9
11	1.40	23.52	5.28	22.28	3.41	16.23	23.49	7.00	6.11	22.43	5.40	21.25	2.33	12.05	1.53	10.37	21.26	7.27		
	3.222	17.95	4.484	24.05	0.544	3.48	17.930	-24.67	4.972	22.30	4.056	18.99	21.816	-13.96	20.745	-17.91	16.962	-11.77	15.25628	11
13	1.24	0.20	5.29	22.38	3.37	16.22	23.42	6.51	6.05	22.38	5.33	21.18	2.25	11.57	1.45	10.29	21.18	7.19		
	3.353	18.45	4.713	24.62	0.630	3.73	17.929	-24.79	5.003	22.35	4.073	19.04	21.818	-13.95	20.745	-17.91	16.959	-11.76	15.38770	13
15	****	****	5.31	22.46	3.33	16.21	23.34	6.42	5.58	22.32	5.26	21.12	2.17	11.50	1.37	10.21	21.10	7.11		
	3.485	18.93	4.926	25.03	0.721	4.03	17.924	-24.90	5.035	22.40	4.091	19.09	21.819	-13.94	20.745	-17.92	16.955	-11.75	15.51912	15
17	****	****	5.33	22.53	3.29	16.21	23.27	6.33	5.52	22.26	5.19	21.05	2.10	11.42	1.30	10.13	21.02	7.03		
	3.617	19.39	5.123	25.30	0.815	4.37	17.915	-25.02	5.067	22.45	4.109	19.15	21.821	-13.94	20.745	-17.92	16.952	-11.75	15.65054	17
19	****	****	5.34	22.57	3.25	16.21	23.19	6.23	5.46	22.21	5.11	20.59	2.02	11.34	1.22	10.05	20.53	6.55		
	3.750	19.82	5.303	25.43	0.913	4.74	17.902	-25.13	5.100	22.49	4.127	19.20	21.822	-13.93	20.744	-17.92	16.949	-11.74	15.78196	19
21	****	****	5.36	22.59	3.21	16.21	23.11	6.14	5.40	22.15	5.04	20.52	1.54	11.26	1.14	9.57	20.45	6.47		
	3.883	20.24	5.463	25.45	1.014	5.15	17.886	-25.25	5.132	22.54	4.145	19.25	21.823	-13.93	20.743	-17.92	16.945	-11.73	15.91337	21
23	****	****	5.37	22.58	3.17	16.22	23.03	6.04	5.33	22.10	4.57	20.46	1.46	11.18	1.06	9.49	20.37	6.39		
	4.017	20.63	5.605	25.35	1.118	5.58	17.866	-25.37	5.165	22.58	4.163	19.30	21.824	-13.93	20.743	-17.93	16.942	-11.73	16.04480	23
25	****	****	5.38	22.56	3.13	16.23	22.55	5.53	5.27	22.04	4.50	20.39	1.38	11.11	0.58	9.41	20.29	6.31		
	4.152	21.00	5.725	25.16	1.225	6.04	17.842	-25.50	5.197	22.63	4.181	19.35	21.824	-13.93	20.742	-17.93	16.938	-11.72	16.17622	25
27	****	****	5.39	22.52	3.09	16.24	22.47	5.43	5.21	21.58	4.43	20.33	1.30	11.03	0.50	9.33	20.21	6.23		
	4.287	21.34	5.824	24.89	1.334	6.53	17.815	-25.62	5.230	22.67	4.199	19.40	21.825	-13.93	20.741	-17.93	16.935	-11.72	16.30764	27
29	****	****	5.38	22.46	3.05	16.26	22.38	5.32	5.15	21.53	4.36	20.27	1.23	10.55	0.42	9.25	20.13	6.15		
	4.422	21.66	5.902	24.53	1.446	7.03	17.784	-25.74	5.263	22.71	4.217	19.44	21.825	-13.93	20.739	-17.94	16.931	-11.72	16.43906	29
31	****	****	5.37	22.38	3.01	16.28	22.29	5.21	5.09	21.47	4.29	20.20	1.15	10.47	0.34	9.17	20.05	6.07		
	4.559	21.95	5.956	24.12	1.560	7.56	17.750	-25.85	5.296	22.74	4.235	19.49	21.825	-13.93	20.738	-17.94	16.928	-11.71	16.57048	31

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Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2452																			
152	1	Pią	062	3.54041	2.15	4.3736	22.05	1.01405	12.5740	-0.32	58.927	2.5	77	426	1243.5	2102	1518	2121.7	253	153	1	
153	2	Sob	063	3.58006	2.06	4.4142	22.13	1.01420	13.4802	-5.54	59.358	3.5	86	425	1243.7	2103	1637	2209.7	311	149	2	
154	3	Nie	064	4.01572	1.56	4.4549	22.21	1.01434	14.3840	-10.55	59.835	4.5	92	424	1243.8	2104	1755	2258.3	329	145	3	
155	4	Pon	065	4.05537	1.46	4.4955	22.28	1.01448	15.3007	-15.20	60.355	5.5	97	423	1244.0	2105	1913	2348.0	350	142	4	
156	5	Wto	066	4.09503	1.35	4.5402	22.34	1.01461	16.2242	-18.57	60.905	6.5	100	423	1244.2	2106	2027	*****	414	138	5	
157	6	Śro	067	4.13469	1.25	4.5809	22.41	1.01474	17.1617	-21.33	61.470	0.3	100	422	1244.3	2107	2136	038.9	444	134	6	
158	7	Czw	068	4.17434	1.14	5.0217	22.47	1.01487	18.1023	-23.03	62.022	1.3	98	421	1244.5	2108	2236	130.7	522	130	7	
159	8	Pią	069	4.21400	1.02	5.0625	22.52	1.01500	19.0413	-23.23	62.530	2.3	95	421	1244.7	2109	2326	222.7	609	126	8	
160	9	Sob	070	4.25365	0.51	5.1033	22.57	1.01512	19.5659	-22.36	62.956	3.3	89	420	1244.9	2110	****	313.7	704	122	9	
161	10	Nie	071	4.29331	0.39	5.1441	23.02	1.01524	20.4804	-20.47	63.266	4.3	83	420	1245.1	2111	005	403.1	806	118	10	
162	11	Pon	072	4.33297	0.27	5.1850	23.06	1.01536	21.3711	-18.06	63.425	5.3	75	420	1245.3	2111	036	450.4	912	114	11	
163	12	Wto	073	4.37262	0.15	5.2259	23.10	1.01547	22.2426	-14.40	63.407	6.3	66	419	1245.5	2112	100	535.6	1020	110	12	
164	13	Śro	074	4.41228	0.02	5.2708	23.13	1.01558	23.1014	-10.39	63.198	7.3	57	419	1245.7	2113	120	619.1	1129	106	13	
165	14	Czw	075	4.45193	-0.11	5.3117	23.16	1.01569	23.5510	-6.11	62.796	0.3	47	419	1245.9	2113	137	701.4	1238	102	14	
166	15	Pią	076	4.49159	-0.23	5.3527	23.19	1.01579	0.4004	-1.25	62.215	1.3	38	419	1246.1	2114	153	743.5	1348	058	15	
167	16	Sob	077	4.53124	-0.36	5.3936	23.21	1.01588	1.2546	3.31	61.484	2.3	28	419	1246.4	2114	208	826.3	1459	054	16	
168	17	Nie	078	4.57090	-0.49	5.4346	23.23	1.01597	2.1314	8.26	60.649	3.3	19	419	1246.6	2115	224	910.9	1613	050	17	
169	18	Pon	079	5.01055	-1.03	5.4755	23.25	1.01606	3.0323	13.07	59.769	4.3	12	419	1246.8	2115	243	958.3	1731	046	18	
170	19	Wto	080	5.05021	-1.16	5.5205	23.26	1.01613	3.5701	17.17	58.911	5.3	6	419	1247.0	2115	306	1049.5	1851	043	19	
171	20	Śro	081	5.08587	-1.29	5.5615	23.26	1.01621	4.5431	20.37	58.146	6.3	2	419	1247.2	2116	335	1145.0	2010	039	20	
172	21	Czw	082	5.12552	-1.42	6.0025	23.26	1.01627	5.5535	22.45	57.536	7.3	0	419	1247.4	2116	413	1244.5	2124	035	21	
173	22	Pią	083	5.16518	-1.55	6.0434	23.26	1.01633	6.5901	23.25	57.127	0.9	1	419	1247.7	2116	506	1346.6	2226	031	22	
174	23	Sob	084	5.20484	-2.08	6.0844	23.25	1.01639	8.0256	22.27	56.944	1.9	5	419	1247.9	2116	613	1449.1	2315	027	23	
175	24	Nie	085	5.24449	-2.21	6.1253	23.24	1.01644	9.0522	19.57	56.986	2.9	12	420	1248.1	2116	732	1549.7	2351	023	24	
176	25	Pon	086	5.28415	-2.34	6.1703	23.23	1.01648	10.0500	16.11	57.227	3.9	20	420	1248.3	2116	856	1647.0	****	019	25	
177	26	Wto	087	5.32380	-2.47	6.2112	23.21	1.01652	11.0125	11.29	57.629	4.9	31	421	1248.5	2116	1022	1740.8	019	015	26	
178	27	Śro	088	5.36346	-2.59	6.2521	23.19	1.01655	11.5457	6.14	58.143	5.9	42	421	1248.7	2116	1145	1831.5	042	011	27	
179	28	Czw	089	5.40311	-3.12	6.2930	23.16	1.01657	12.4623	0.45	58.725	0.3	53	422	1248.9	2116	1306	1920.1	101	007	28	
180	29	Pią	090	5.44277	-3.24	6.3339	23.13	1.01660	13.3639	-4.39	59.337	1.3	64	422	1249.1	2116	1426	2007.8	119	003	29	
181	30	Sob	091	5.48242	-3.36	6.3747	23.09	1.01661	14.2640	-9.44	59.950	2.3	74	423	1249.3	2115	1543	2055.5	137	2355	30	

Fazy Księżyca [Dm, h.mm]: Pełn 6, 3.39 3kw 14, 5.28 Nów 21, 13.58 1kw 28, 5.20

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Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	*****	*****	5.36	22.33	2.59	16.29	22.24	5.16	5.05	21.44	4.25	20.17	1.11	10.43	0.30	9.13	20.01	6.03		
	4.627	22.09	5.975	23.89	1.618	7.83	17.732	-25.91	5.313	22.76	4.244	19.51	21.825	-13.93	20.737	-17.95	16.926	-11.71	16.63619	1
3	*****	*****	5.34	22.22	2.55	16.31	22.15	5.05	4.59	21.39	4.18	20.10	1.03	10.35	0.22	9.05	19.53	5.55		
	4.763	22.34	5.995	23.39	1.736	8.38	17.694	-26.02	5.346	22.80	4.261	19.56	21.824	-13.93	20.736	-17.95	16.922	-11.71	16.76761	3
5	*****	*****	5.30	22.10	2.51	16.34	22.06	4.53	4.53	21.33	4.11	20.04	0.55	10.27	0.15	8.57	19.45	5.47		
	4.901	22.57	5.993	22.86	1.855	8.94	17.653	-26.13	5.379	22.83	4.279	19.61	21.824	-13.94	20.734	-17.96	16.919	-11.70	16.89903	5
7	*****	*****	5.25	21.57	2.47	16.36	21.56	4.42	4.47	21.28	4.04	19.57	0.47	10.19	0.07	8.49	19.36	5.39		
	5.038	22.78	5.970	22.30	1.977	9.51	17.610	-26.23	5.412	22.86	4.297	19.65	21.823	-13.94	20.732	-17.97	16.915	-11.70	17.03045	7
9	*****	*****	5.19	21.42	2.44	16.39	21.47	4.31	4.41	21.22	3.57	19.51	0.39	10.11	23.55	8.41	19.28	5.31		
	5.176	22.95	5.928	21.72	2.101	10.09	17.565	-26.33	5.445	22.89	4.315	19.70	21.822	-13.95	20.730	-17.98	16.911	-11.70	17.16188	9
11	*****	*****	5.12	21.26	2.40	16.42	21.37	4.19	4.35	21.16	3.50	19.44	0.31	10.03	23.47	8.33	19.20	5.23		
	5.314	23.10	5.870	21.15	2.227	10.68	17.518	-26.42	5.479	22.92	4.333	19.74	21.821	-13.96	20.728	-17.98	16.908	-11.70	17.29330	11
13	*****	*****	5.04	21.10	2.36	16.45	21.27	4.08	4.29	21.11	3.42	19.38	0.23	9.55	23.39	8.25	19.12	5.14		
	5.452	23.22	5.800	20.59	2.354	11.27	17.470	-26.50	5.512	22.95	4.351	19.78	21.819	-13.96	20.726	-17.99	16.904	-11.70	17.42472	13
15	*****	*****	4.55	20.54	2.33	16.48	21.16	3.56	4.23	21.05	3.35	19.31	0.16	9.47	23.31	8.17	19.04	5.06		
	5.591	23.32	5.723	20.07	2.484	11.87	17.421	-26.57	5.545	22.97	4.368	19.83	21.818	-13.97	20.724	-18.00	16.901	-11.70	17.55614	15
17	*****	*****	4.45	20.38	2.29	16.52	21.06	3.45	4.17	20.59	3.28	19.25	0.08	9.39	23.23	8.09	18.56	4.58		
	5.729	23.39	5.644	19.60	2.615	12.46	17.373	-26.64	5.579	23.00	4.386	19.87	21.816	-13.98	20.721	-18.01	16.897	-11.69	17.68756	17
19	*****	*****	4.36	20.23	2.26	16.56	20.56	3.34	4.11	20.54	3.21	19.18	23.56	9.31	23.15	8.01	18.48	4.50		
	5.868	23.43	5.568	19.21	2.748	13.05	17.324	-26.69	5.612	23.02	4.403	19.91	21.814	-14.00	20.719	-18.02	16.894	-11.69	17.81898	19
21	*****	*****	4.26	20.09	2.23	16.59	20.46	3.23	4.05	20.48	3.14	19.12	23.48	9.23	23.07	7.53	18.40	4.42		
	6.007	23.44	5.501	18.90	2.883	13.64	17.276	-26.74	5.645	23.04	4.420	19.95	21.812	-14.01	20.716	-18.03	16.890	-11.70	17.95040	21
23	*****	*****	4.16	19.57	2.19	17.03	20.35	3.12	3.59	20.42	3.07	19.05	23.40	9.15	22.59	7.45	18.32	4.34		
	6.146	23.42	5.446	18.70	3.019	14.22	17.229	-26.78	5.679	23.06	4.438	19.99	21.809	-14.02	20.713	-18.04	16.887	-11.70	18.08183	23
25	*****	*****	4.07	19.46	2.16	17.07	20.25	3.01	3.53	20.36	2.60	18.59	23.32	9.07	22.51	7.37	18.24	4.26		
	6.284	23.38	5.408	18.60	3.158	14.79	17.184	-26.81	5.712	23.08	4.455	20.02	21.807	-14.04	20.710	-18.05	16.884	-11.70	18.21325	25
27	*****	*****	3.58	19.37	2.13	17.11	20.15	2.50	3.47	20.31	2.53	18.52	23.24	8.59	22.43	7.29	18.16	4.18		
	6.423	23.31	5.389	18.61	3.297	15.35	17.141	-26.83	5.745	23.09	4.472	20.06	21.804	-14.05	20.708	-18.06	16.880	-11.70	18.34467	27
29	*****	*****	3.49	19.30	2.11	17.15	20.05	2.40	3.41	20.25	2.46	18.46	23.16	8.51	22.35	7.20	18.08	4.10		
	6.561	23.21	5.390	18.72	3.439	15.90	17.101	-26.85	5.778	23.11	4.488	20.10	21.801	-14.07	20.705	-18.08	16.877	-11.70	18.47608	29

LIPIEC 2001

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2452																			
182	1	Nie	092	5.52208	-3.48	6.4156	23.05	1.01663	15.1711	-14.16	60.547	3.3	83	424	1249.5	2115	1700	2144.0	156	2351	1	
183	2	Pon	093	5.56174	-3.59	6.4603	23.01	1.01664	16.0841	-18.04	61.117	4.3	90	424	1249.7	2115	1814	2233.7	219	2347	2	
184	3	Wto	094	6.00139	-4.10	6.5011	22.56	1.01664	17.0116	-20.55	61.654	5.3	95	425	1249.9	2114	1924	2324.5	246	2344	3	
185	4	Śro	095	6.04105	-4.21	6.5418	22.51	1.01664	17.5441	-22.44	62.153	6.3	99	426	1250.1	2114	2027	*****	320	2340	4	
186	5	Czw	096	6.08070	-4.31	6.5825	22.46	1.01664	18.4818	-23.24	62.603	7.3	100	427	1250.3	2113	2121	016.0	403	2336	5	
187	6	Pią	097	6.12036	-4.41	7.0232	22.40	1.01664	19.4117	-22.57	62.992	0.8	99	428	1250.4	2113	2204	107.1	455	2332	6	
188	7	Sob	098	6.16002	-4.51	7.0638	22.33	1.01663	20.3253	-21.26	63.300	1.8	97	429	1250.6	2112	2237	157.2	555	2328	7	
189	8	Nie	099	6.19567	-5.00	7.1044	22.27	1.01662	21.2239	-18.59	63.507	2.8	93	430	1250.8	2111	2304	245.3	700	2324	8	
190	9	Pon	100	6.23533	-5.09	7.1450	22.19	1.01660	22.1027	-15.46	63.587	3.8	87	431	1250.9	2110	2325	331.3	807	2320	9	
191	10	Wto	101	6.27498	-5.18	7.1855	22.12	1.01658	22.5632	-11.55	63.517	4.8	80	432	1251.0	2110	2343	415.3	915	2316	10	
192	11	Śro	102	6.31464	-5.26	7.2259	22.04	1.01656	23.4122	-7.36	63.280	5.8	72	433	1251.2	2109	2359	457.7	1024	2312	11	
193	12	Czw	103	6.35429	-5.34	7.2704	21.56	1.01653	0.2540	-2.58	62.866	6.8	63	434	1251.3	2108	000	539.3	1132	2308	12	
194	13	Pią	104	6.39395	-5.41	7.3107	21.47	1.01650	1.1016	1.51	62.277	7.8	54	435	1251.4	2107	014	621.0	1242	2304	13	
195	14	Sob	105	6.43360	-5.48	7.3511	21.38	1.01646	1.5604	6.42	61.529	0.6	44	437	1251.5	2106	030	703.7	1353	2300	14	
196	15	Nie	106	6.47326	-5.54	7.3914	21.29	1.01642	2.4403	11.24	60.656	1.6	34	438	1251.6	2105	046	748.6	1507	2256	15	
197	16	Pon	107	6.51292	-5.60	7.4316	21.19	1.01638	3.3510	15.43	59.709	2.6	24	439	1251.7	2104	106	836.8	1624	2252	16	
198	17	Wto	108	6.55257	-6.05	7.4718	21.09	1.01632	4.3008	19.22	58.752	3.6	15	440	1251.8	2102	131	929.2	1743	2249	17	
199	18	Śro	109	6.59223	-6.10	7.5119	20.59	1.01627	5.2912	22.01	57.862	4.6	8	442	1251.9	2101	204	1026.1	1900	2245	18	
200	19	Czw	110	7.03188	-6.14	7.5520	20.48	1.01620	6.3146	23.20	57.118	5.6	3	443	1252.0	2100	249	1127.1	2008	2241	19	
201	20	Pią	111	7.07154	-6.18	7.5920	20.37	1.01613	7.3620	23.02	56.587	6.6	0	444	1252.0	2059	350	1230.4	2104	2237	20	
202	21	Sob	112	7.11120	-6.21	8.0320	20.25	1.01606	8.4046	21.06	56.319	0.6	1	446	1252.1	2057	505	1333.5	2147	2233	21	
203	22	Nie	113	7.15085	-6.24	8.0719	20.13	1.01597	9.4312	17.41	56.333	1.6	4	447	1252.1	2056	630	1434.2	2220	2229	22	
204	23	Pon	114	7.19051	-6.26	8.1118	20.01	1.01589	10.4234	13.07	56.615	2.6	10	449	1252.2	2055	759	1531.4	2245	2225	23	
205	24	Wto	115	7.23016	-6.27	8.1516	19.49	1.01579	11.3843	7.50	57.124	3.6	18	450	1252.2	2053	926	1625.0	2306	2221	24	
206	25	Śro	116	7.26582	-6.28	8.1913	19.36	1.01569	12.3212	2.13	57.801	4.6	28	452	1252.2	2052	1051	1715.8	2325	2217	25	
207	26	Czw	117	7.30547	-6.28	8.2310	19.23	1.01559	13.2353	-3.22	58.578	5.6	39	453	1252.2	2050	1213	1804.9	2343	2213	26	
208	27	Pią	118	7.34513	-6.28	8.2706	19.09	1.01548	14.1440	-8.38	59.393	6.6	50	455	1252.2	2048	1332	1853.2	****	2209	27	
209	28	Sob	119	7.38478	-6.27	8.3102	18.55	1.01537	15.0525	-13.21	60.193	1.0	61	456	1252.2	2047	1450	1941.7	002	2205	28	
210	29	Nie	120	7.42444	-6.25	8.3457	18.41	1.01525	15.5641	-17.19	60.940	2.0	71	458	1252.2	2045	1605	2031.0	024	2201	29	
211	30	Pon	121	7.46410	-6.23	8.3851	18.27	1.01513	16.4848	-20.23	61.610	3.0	79	500	1252.1	2044	1716	2121.1	049	2157	30	
212	31	Wto	122	7.50375	-6.20	8.4245	18.12	1.01500	17.4139	-22.26	62.192	4.0	87	501	1252.1	2042	1821	2212.0	121	2153	31	

Fazy Księżyca [Dm, h.mm]: Pełn 5, 17.04 3kw 13, 20.45 Nów 20, 21.45 1kw 27, 12.08

LIPIEC 2001 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	*****	*****	3.41	19.25	2.08	17.19	19.55	2.30	3.35	20.19	2.38	18.39	23.08	8.43	22.27	7.12	17.60	4.02		
	6.699	23.09	5.414	18.93	3.582	16.43	17.063	-26.86	5.811	23.12	4.505	20.13	21.798	-14.08	20.701	-18.09	16.874	-11.71	18.60750	1
3	*****	*****	3.34	19.22	2.05	17.23	19.45	2.20	3.29	20.13	2.31	18.32	23.00	8.34	22.19	7.04	17.52	3.54		
	6.836	22.94	5.461	19.22	3.727	16.96	17.029	-26.87	5.844	23.13	4.521	20.17	21.795	-14.10	20.698	-18.10	16.871	-11.71	18.73893	3
5	*****	*****	3.28	19.21	2.03	17.27	19.35	2.10	3.23	20.07	2.24	18.26	22.52	8.26	22.11	6.56	17.44	3.46		
	6.974	22.76	5.530	19.58	3.874	17.46	16.998	-26.87	5.877	23.14	4.538	20.20	21.792	-14.12	20.695	-18.11	16.868	-11.71	18.87035	5
7	*****	*****	3.23	19.21	2.01	17.31	19.26	2.00	3.17	20.02	2.17	18.19	22.44	8.18	22.03	6.48	17.36	3.38		
	7.111	22.56	5.623	19.99	4.022	17.94	16.970	-26.87	5.910	23.15	4.554	20.23	21.788	-14.14	20.692	-18.13	16.865	-11.72	19.00177	7
9	*****	*****	3.19	19.23	1.59	17.36	19.16	1.51	3.11	19.56	2.10	18.12	22.36	8.10	21.55	6.40	17.28	3.30		
	7.247	22.32	5.739	20.43	4.171	18.41	16.946	-26.87	5.942	23.16	4.570	20.27	21.784	-14.16	20.689	-18.14	16.862	-11.72	19.13320	9
11	*****	*****	3.16	19.27	1.57	17.40	19.07	1.42	3.05	19.50	2.03	18.06	22.28	8.02	21.47	6.32	17.20	3.22		
	7.383	22.07	5.878	20.89	4.323	18.85	16.927	-26.86	5.975	23.16	4.585	20.30	21.781	-14.18	20.685	-18.15	16.859	-11.73	19.26461	11
13	*****	*****	3.14	19.32	1.56	17.44	18.58	1.33	2.59	19.44	1.56	17.59	22.20	7.53	21.39	6.23	17.12	3.13		
	7.519	21.79	6.040	21.34	4.476	19.27	16.911	-26.86	6.007	23.16	4.601	20.33	21.777	-14.20	20.682	-18.17	16.856	-11.73	19.39603	13
15	*****	*****	3.15	19.38	1.54	17.48	18.50	1.25	2.53	19.38	1.48	17.52	22.12	7.45	21.31	6.15	17.04	3.05		
	7.654	21.48	6.224	21.76	4.630	19.66	16.899	-26.85	6.039	23.17	4.616	20.36	21.772	-14.22	20.678	-18.18	16.854	-11.74	19.52745	15
17	*****	*****	3.16	19.45	1.53	17.52	18.41	1.16	2.47	19.32	1.41	17.45	22.04	7.37	21.23	6.07	16.56	2.57		
	7.788	21.15	6.430	22.11	4.786	20.02	16.892	-26.85	6.071	23.17	4.631	20.38	21.768	-14.25	20.675	-18.19	16.851	-11.75	19.65887	17
19	*****	*****	3.20	19.53	1.52	17.56	18.33	1.08	2.41	19.26	1.34	17.38	21.56	7.29	21.15	5.59	16.48	2.49		
	7.922	20.80	6.656	22.38	4.943	20.36	16.889	-26.85	6.103	23.16	4.646	20.41	21.764	-14.27	20.671	-18.21	16.849	-11.75	19.79030	19
21	*****	*****	3.26	20.01	1.52	17.60	18.25	1.01	2.35	19.20	1.27	17.32	21.48	7.20	21.07	5.51	16.40	2.41		
	8.056	20.42	6.901	22.55	5.101	20.67	16.890	-26.85	6.134	23.16	4.660	20.44	21.759	-14.29	20.667	-18.22	16.846	-11.76	19.92172	21
23	*****	*****	3.33	20.09	1.51	18.03	18.18	0.53	2.29	19.14	1.20	17.25	21.40	7.12	20.59	5.43	16.32	2.33		
	8.188	20.02	7.162	22.57	5.261	20.94	16.895	-26.85	6.166	23.16	4.674	20.46	21.755	-14.32	20.664	-18.24	16.844	-11.77	20.05314	23
25	*****	*****	3.43	20.17	1.51	18.07	18.11	0.46	2.23	19.08	1.13	17.18	21.32	7.04	20.51	5.34	16.24	2.25		
	8.320	19.59	7.438	22.44	5.422	21.18	16.904	-26.85	6.197	23.15	4.688	20.49	21.750	-14.34	20.660	-18.25	16.842	-11.78	20.18456	25
27	*****	*****	3.54	20.24	1.52	18.10	18.04	0.39	2.17	19.02	1.05	17.11	21.24	6.56	20.43	5.26	16.16	2.17		
	8.452	19.15	7.724	22.14	5.583	21.39	16.918	-26.86	6.228	23.15	4.702	20.51	21.745	-14.37	20.656	-18.26	16.840	-11.79	20.31597	27
29	1.12	0.05	4.07	20.30	1.52	18.13	17.57	0.32	2.11	18.56	0.58	17.04	21.16	6.47	20.35	5.18	16.08	2.09		
	8.582	18.68	8.016	21.66	5.746	21.57	16.935	-26.87	6.258	23.14	4.715	20.53	21.741	-14.39	20.653	-18.28	16.838	-11.80	20.44739	29
31	1.35	-0.06	4.22	20.35	1.53	18.16	17.50	0.25	2.05	18.50	0.51	16.57	21.08	6.39	20.27	5.10	16.00	2.01		
	8.712	18.20	8.310	21.01	5.910	21.71	16.956	-26.88	6.288	23.13	4.728	20.55	21.736	-14.42	20.649	-18.29	16.837	-11.81	20.57881	31

SIERPIEŃ 2001

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
213	1	Śro	123	7.54341	-6.16	8.4638	17.57	1.01487	18.3449	-23.22	62.679	5.0	93	503	1252.0	2040	1917	2302.9	200	2150	1
214	2	Czw	124	7.58306	-6.12	8.5030	17.42	1.01474	19.2738	-23.11	63.073	6.0	97	504	1252.0	2038	2003	2353.0	249	2146	2
215	3	Pią	125	8.02272	-6.07	8.5422	17.26	1.01460	20.1923	-21.55	63.374	7.0	99	506	1251.9	2037	2039	*****	346	2142	3
216	4	Sob	126	8.06238	-6.02	8.5813	17.10	1.01447	21.0931	-19.42	63.580	0.2	100	508	1251.8	2035	2108	041.6	450	2138	4
217	5	Nie	127	8.10203	-5.56	9.0204	16.54	1.01433	21.5746	-16.38	63.685	1.2	99	509	1251.7	2033	2130	128.3	557	2134	5
218	6	Pon	128	8.14169	-5.50	9.0554	16.37	1.01418	22.4415	-12.55	63.680	2.2	96	511	1251.6	2031	2149	212.9	705	2130	6
219	7	Wto	129	8.18134	-5.42	9.0943	16.21	1.01403	23.2918	-8.42	63.553	3.2	91	513	1251.5	2029	2205	255.7	813	2126	7
220	8	Śro	130	8.22100	-5.35	9.1332	16.04	1.01389	0.1330	-4.09	63.291	4.2	85	514	1251.3	2027	2220	337.4	921	2122	8
221	9	Czw	131	8.26065	-5.26	9.1720	15.47	1.01373	0.5733	0.37	62.883	5.2	78	516	1251.2	2025	2235	418.6	1030	2118	9
222	10	Pią	132	8.30031	-5.17	9.2108	15.29	1.01358	1.4218	5.25	62.325	6.2	69	518	1251.0	2023	2251	500.3	1140	2114	10
223	11	Sob	133	8.33596	-5.08	9.2455	15.11	1.01342	2.2836	10.06	61.621	7.2	59	519	1250.9	2021	2309	543.3	1251	2110	11
224	12	Nie	134	8.37562	-4.58	9.2841	14.53	1.01325	3.1724	14.27	60.790	0.1	49	521	1250.7	2019	2331	628.9	1405	2106	12
225	13	Pon	135	8.41527	-4.48	9.3227	14.35	1.01309	4.0932	18.16	59.868	1.1	39	523	1250.5	2017	****	717.9	1521	2102	13
226	14	Wto	136	8.45493	-4.37	9.3613	14.17	1.01292	5.0530	21.14	58.905	2.1	28	524	1250.4	2015	000	811.2	1637	2058	14
227	15	Śro	137	8.49459	-4.25	9.3958	13.58	1.01274	6.0518	23.03	57.970	3.1	19	526	1250.2	2013	037	908.7	1748	2054	15
228	16	Czw	138	8.53424	-4.13	9.4342	13.39	1.01256	7.0804	23.26	57.140	4.1	11	528	1250.0	2011	128	1009.8	1850	2051	16
229	17	Pią	139	8.57390	-4.00	9.4726	13.20	1.01237	8.1211	22.12	56.494	5.1	4	530	1249.8	2009	236	1112.6	1938	2047	17
230	18	Sob	140	9.01355	-3.47	9.5110	13.01	1.01218	9.1545	19.22	56.101	6.1	1	531	1249.5	2007	357	1214.7	2016	2043	18
231	19	Nie	141	9.05321	-3.34	9.5453	12.41	1.01199	10.1713	15.10	56.002	0.3	0	533	1249.3	2004	525	1314.6	2044	2039	19
232	20	Pon	142	9.09286	-3.20	9.5835	12.21	1.01179	11.1555	9.59	56.209	1.3	3	535	1249.1	2002	656	1411.3	2108	2035	20
233	21	Wto	143	9.13252	-3.05	10.0217	12.02	1.01158	12.1155	4.15	56.695	2.3	8	536	1248.8	2000	825	1505.0	2128	2031	21
234	22	Śro	144	9.17217	-2.50	10.0559	11.41	1.01137	13.0551	-1.35	57.406	3.3	16	538	1248.6	1958	951	1556.6	2146	2027	22
235	23	Czw	145	9.21183	-2.35	10.0940	11.21	1.01116	13.5830	-7.11	58.269	4.3	25	540	1248.3	1956	1114	1646.8	2206	2023	23
236	24	Pią	146	9.25148	-2.19	10.1321	11.01	1.01094	14.5039	-12.14	59.204	5.3	35	542	1248.1	1953	1235	1736.7	2227	2019	24
237	25	Sob	147	9.29114	-2.02	10.1701	10.40	1.01072	15.4255	-16.31	60.140	6.3	46	543	1247.8	1951	1354	1826.8	2251	2015	25
238	26	Nie	148	9.33079	-1.45	10.2041	10.19	1.01049	16.3537	-19.53	61.017	0.6	56	545	1247.5	1949	1508	1917.4	2321	2011	26
239	27	Pon	149	9.37045	-1.28	10.2420	9.58	1.01026	17.2847	-22.11	61.793	1.6	66	547	1247.2	1947	1615	2008.5	2358	2007	27
240	28	Wto	150	9.41010	-1.11	10.2759	9.37	1.01003	18.2206	-23.23	62.444	2.6	75	548	1246.9	1944	1714	2059.5	0**	2003	28
241	29	Śro	151	9.44576	-0.53	10.3138	9.16	1.00980	19.1459	-23.26	62.956	3.6	83	550	1246.6	1942	1803	2149.8	044	1959	29
242	30	Czw	152	9.48542	-0.34	10.3516	8.54	1.00956	20.0652	-22.24	63.329	4.6	89	552	1246.3	1940	1842	2238.8	139	1956	30
243	31	Pią	153	9.52507	-0.16	10.3854	8.33	1.00933	20.5714	-20.22	63.570	5.6	95	554	1246.0	1937	1912	2325.9	241	1952	31

Fazy Księżyca [Dm, h.mm]: Pełn 4, 7.56 3kw 12, 9.53 Now 19, 4.55 1kw 25, 21.55

WRZESIEŃ 2001

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)											Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j	astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2452																			
244	1	Sob	154	9.56473	0.03	10.4231	8.11	1.00909	21.4550	-17.29	63.690	6.6	98	555	1245.7	1935	1936	*****	347	1948	1	
245	2	Nie	155	10.00438	0.22	10.4609	7.49	1.00885	22.3241	-13.53	63.697	7.6	100	557	1245.4	1933	1955	011.1	455	1944	2	
246	3	Pon	156	10.04404	0.42	10.4945	7.27	1.00860	23.1805	-9.44	63.599	0.5	100	559	1245.0	1930	2012	054.4	604	1940	3	
247	4	Wto	157	10.08369	1.02	10.5322	7.05	1.00836	0.0231	-5.11	63.400	1.5	98	600	1244.7	1928	2027	136.5	712	1936	4	
248	5	Śro	158	10.12335	1.22	10.5659	6.43	1.00812	0.4635	-0.25	63.099	2.5	94	602	1244.4	1925	2042	217.8	821	1932	5	
249	6	Czw	159	10.16300	1.42	11.0035	6.21	1.00787	1.3101	4.25	62.693	3.5	89	604	1244.0	1923	2057	259.2	931	1928	6	
250	7	Pią	160	10.20266	2.03	11.0411	5.58	1.00762	2.1636	9.08	62.179	4.5	82	606	1243.7	1921	2114	341.6	1041	1924	7	
251	8	Sob	161	10.24231	2.23	11.0747	5.36	1.00737	3.0408	13.34	61.557	5.5	74	607	1243.4	1918	2134	425.8	1154	1920	8	
252	9	Nie	162	10.28197	2.44	11.1123	5.13	1.00712	3.5423	17.30	60.834	6.5	64	609	1243.0	1916	2159	512.7	1308	1916	9	
253	10	Pon	163	10.32162	3.05	11.1458	4.50	1.00687	4.4753	20.40	60.028	7.5	54	611	1242.7	1914	2231	603.0	1422	1912	10	
254	11	Wto	164	10.36128	3.26	11.1834	4.27	1.00662	5.4450	22.49	59.171	0.6	43	612	1242.3	1911	2315	657.2	1533	1908	11	
255	12	Śro	165	10.40094	3.47	11.2209	4.05	1.00636	6.4448	23.40	58.312	1.6	32	614	1242.0	1909	****	755.0	1637	1904	12	
256	13	Czw	166	10.44059	4.08	11.2545	3.42	1.00610	7.4641	23.03	57.512	2.6	22	616	1241.6	1906	013	855.1	1730	1900	13	
257	14	Pią	167	10.48025	4.30	11.2920	3.19	1.00584	8.4860	20.52	56.842	3.6	13	618	1241.3	1904	126	956.0	1811	1857	14	
258	15	Sob	168	10.51590	4.51	11.3255	2.56	1.00558	9.5018	17.14	56.371	4.6	6	619	1240.9	1901	250	1055.8	1842	1853	15	
259	16	Nie	169	10.55556	5.12	11.3631	2.32	1.00531	10.4942	12.25	56.158	5.6	2	621	1240.5	1859	420	1153.6	1908	1849	16	
260	17	Pon	170	10.59521	5.33	11.4006	2.09	1.00504	11.4658	6.49	56.235	6.6	0	623	1240.2	1857	550	1248.9	1929	1845	17	
261	18	Wto	171	11.03487	5.55	11.4341	1.46	1.00477	12.4225	0.50	56.602	1.0	1	624	1239.8	1854	719	1342.2	1948	1841	18	
262	19	Śro	172	11.07452	6.16	11.4716	1.23	1.00449	13.3641	-5.05	57.225	2.0	6	626	1239.5	1852	846	1434.3	2007	1837	19	
263	20	Czw	173	11.11418	6.37	11.5052	0.59	1.00421	14.3027	-10.34	58.045	3.0	12	628	1239.1	1849	1012	1525.9	2027	1833	20	
264	21	Pią	174	11.15383	6.59	11.5427	0.36	1.00393	15.2415	-15.20	58.984	4.0	21	630	1238.8	1847	1134	1617.6	2051	1829	21	
265	22	Sob	175	11.19349	7.20	11.5802	0.13	1.00365	16.1822	-19.09	59.960	5.0	30	631	1238.4	1845	1253	1709.6	2119	1825	22	
266	23	Nie	176	11.23314	7.41	12.0138	-0.11	1.00336	17.1248	-21.52	60.901	6.0	40	633	1238.1	1842	1405	1802.0	2154	1821	23	
267	24	Pon	177	11.27280	8.02	12.0514	-0.34	1.00307	18.0711	-23.24	61.747	0.0	50	635	1237.7	1840	1509	1854.2	2238	1817	24	
268	25	Wto	178	11.31245	8.22	12.0849	-0.57	1.00279	19.0057	-23.45	62.455	1.0	60	636	1237.4	1837	1602	1945.4	2331	1813	25	
269	26	Śro	179	11.35211	8.43	12.1225	-1.21	1.00250	19.5332	-22.59	63.000	2.0	69	638	1237.0	1835	1644	2035.2	****	1809	26	
270	27	Czw	180	11.39176	9.03	12.1601	-1.44	1.00221	20.4426	-21.10	63.371	3.0	78	640	1236.7	1832	1716	2123.0	031	1805	27	
271	28	Pią	181	11.43142	9.24	12.1938	-2.07	1.00192	21.3328	-18.27	63.573	4.0	85	642	1236.4	1830	1742	2208.7	136	1801	28	
272	29	Sob	182	11.47108	9.44	12.2314	-2.31	1.00163	22.2041	-14.58	63.619	5.0	91	643	1236.0	1828	1802	2252.6	244	1758	29	
273	30	Nie	183	11.51073	10.04	12.2651	-2.54	1.00134	23.0624	-10.54	63.529	6.0	96	645	1235.7	1825	1820	2335.0	353	1754	30	

Fazy Księżyca [Dm, h.mm]: Pełn 2, 23.43 3kw 10, 20.59 Now 17, 12.27 1kw 24, 11.31

WRZESIEŃ 2001 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	3.44	21.46	8.05	20.05	2.48	18.29	16.32	23.01	0.28	17.08	22.49	15.02	19.00	4.26	18.20	2.59	13.55	23.50		
	10.709	8.18	12.028	-0.50	8.576	18.72	17.734	-27.00	6.725	22.85	4.885	20.77	21.654	-14.83	20.594	-18.50	16.827	-12.01	22.68153	1
3	3.49	21.40	8.15	20.00	2.53	18.28	16.28	22.57	0.21	17.01	22.41	14.55	18.52	4.17	18.12	2.51	13.47	23.42		
	10.829	7.45	12.198	-1.91	8.740	18.21	17.805	-26.97	6.749	22.83	4.891	20.77	21.649	-14.85	20.591	-18.51	16.828	-12.03	22.81294	3
5	3.54	21.34	8.24	19.55	2.59	18.26	16.25	22.54	0.15	16.55	22.34	14.47	18.44	4.09	18.04	2.43	13.39	23.34		
	10.950	6.71	12.363	-3.28	8.904	17.66	17.877	-26.94	6.772	22.81	4.897	20.78	21.644	-14.88	20.588	-18.52	16.828	-12.05	22.94436	5
7	3.59	21.27	8.33	19.49	3.05	18.24	16.21	22.51	0.09	16.48	22.26	14.40	18.36	4.01	17.56	2.35	13.32	23.26		
	11.070	5.97	12.522	-4.61	9.067	17.08	17.951	-26.91	6.794	22.78	4.902	20.78	21.640	-14.90	20.586	-18.54	16.829	-12.06	23.07577	7
9	4.04	21.21	8.41	19.44	3.10	18.22	16.17	22.48	0.02	16.41	22.19	14.32	18.28	3.53	17.48	2.27	13.24	23.18		
	11.190	5.22	12.676	-5.90	9.229	16.47	18.026	-26.86	6.816	22.76	4.907	20.79	21.635	-14.92	20.583	-18.55	16.830	-12.08	23.20719	9
11	4.09	21.15	8.49	19.38	3.16	18.20	16.13	22.45	23.52	16.34	22.11	14.25	18.20	3.44	17.40	2.19	13.16	23.10		
	11.309	4.46	12.824	-7.14	9.391	15.83	18.104	-26.80	6.838	22.74	4.911	20.79	21.631	-14.94	20.581	-18.56	16.832	-12.10	23.33861	11
13	4.13	21.09	8.56	19.32	3.22	18.17	16.10	22.43	23.45	16.28	22.03	14.17	18.12	3.36	17.32	2.11	13.09	23.02		
	11.429	3.69	12.966	-8.32	9.552	15.16	18.183	-26.74	6.858	22.71	4.915	20.79	21.626	-14.96	20.578	-18.56	16.833	-12.11	23.47004	13
15	4.18	21.03	9.02	19.26	3.28	18.15	16.06	22.40	23.39	16.21	21.56	14.09	18.04	3.28	17.24	2.03	13.01	22.54		
	11.549	2.93	13.100	-9.45	9.712	14.46	18.263	-26.67	6.878	22.69	4.918	20.79	21.622	-14.98	20.576	-18.57	16.834	-12.13	23.60145	15
17	4.22	20.57	9.08	19.20	3.34	18.12	16.02	22.38	23.32	16.14	21.48	14.02	17.56	3.20	17.16	1.55	12.53	22.46		
	11.668	2.15	13.227	-10.50	9.871	13.73	18.345	-26.58	6.898	22.67	4.921	20.79	21.618	-15.00	20.574	-18.58	16.836	-12.15	23.73287	17
19	4.27	20.52	9.13	19.14	3.40	18.09	15.58	22.36	23.26	16.07	21.40	13.54	17.48	3.11	17.08	1.47	12.46	22.39		
	11.788	1.38	13.345	-11.47	10.030	12.97	18.428	-26.49	6.917	22.65	4.923	20.79	21.614	-15.02	20.572	-18.59	16.838	-12.16	23.86428	19
21	4.31	20.46	9.16	19.07	3.47	18.06	15.55	22.34	23.19	16.00	21.33	13.46	17.40	3.03	17.00	1.39	12.38	22.31		
	11.907	0.60	13.452	-12.35	10.187	12.19	18.513	-26.38	6.935	22.63	4.925	20.79	21.610	-15.04	20.570	-18.60	16.840	-12.18	23.99570	21
23	4.35	20.40	9.19	19.00	3.53	18.03	15.51	22.32	23.13	15.53	21.25	13.38	17.32	2.55	16.52	1.31	12.30	22.23		
	12.027	-0.18	13.547	-13.12	10.344	11.39	18.598	-26.27	6.952	22.61	4.926	20.79	21.606	-15.06	20.568	-18.60	16.842	-12.20	0.12712	23
25	4.39	20.35	9.19	18.53	3.59	17.60	15.47	22.31	23.06	15.46	21.17	13.31	17.24	2.47	16.44	1.23	12.23	22.15		
	12.147	-0.96	13.627	-13.78	10.500	10.56	18.685	-26.14	6.969	22.58	4.927	20.78	21.602	-15.08	20.566	-18.61	16.844	-12.22	0.25854	25
27	4.43	20.30	9.18	18.46	4.05	17.56	15.43	22.29	22.59	15.39	21.09	13.23	17.16	2.39	16.37	1.15	12.15	22.07		
	12.267	-1.73	13.690	-14.29	10.656	9.71	18.773	-26.00	6.985	22.57	4.927	20.78	21.599	-15.09	20.565	-18.62	16.846	-12.23	0.38996	27
29	4.47	20.24	9.15	18.39	4.11	17.53	15.40	22.28	22.52	15.32	21.01	13.15	17.08	2.31	16.29	1.07	12.07	21.59		
	12.387	-2.51	13.732	-14.63	10.811	8.85	18.861	-25.85	7.001	22.55	4.927	20.77	21.596	-15.11	20.563	-18.62	16.849	-12.25	0.52138	29

PAŹDZIERNIK 2001

Piwnice, CA UMK			← Dane na godz. 12 czasu strefowego (= 10 lub 11 ^b UT) →									 Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2452																		
274	1	Pon	184	11.55038	10.23	12.3028	-3.17	1.00105	23.5105	-6.23	63.325	7.0	99	647	1235.4	1823	1835	*****	502	1750	1
275	2	Wto	185	11.59004	10.42	12.3405	-3.41	1.00076	0.3521	-1.35	63.027	8.0	100	649	1235.0	1820	1849	016.7	611	1746	2
276	3	Śro	186	12.02569	11.01	12.3743	-4.04	1.00048	1.1954	3.20	62.652	0.8	99	650	1234.7	1818	1904	058.2	721	1742	3
277	4	Czw	187	12.06535	11.20	12.4121	-4.27	1.00019	2.0527	8.11	62.214	1.8	97	652	1234.4	1816	1920	140.5	832	1738	4
278	5	Pią	188	12.10500	11.38	12.4459	-4.50	0.99991	2.5243	12.46	61.720	2.8	92	654	1234.1	1813	1939	224.3	945	1734	5
279	6	Sob	189	12.14466	11.56	12.4838	-5.13	0.99963	3.4222	16.52	61.174	3.8	86	656	1233.8	1811	2001	310.5	1059	1730	6
280	7	Nie	190	12.18432	12.13	12.5217	-5.36	0.99935	4.3453	20.15	60.580	4.8	78	657	1233.5	1809	2031	359.6	1214	1726	7
281	8	Pon	191	12.22397	12.30	12.5557	-5.59	0.99906	5.3023	22.39	59.945	5.8	69	659	1233.2	1806	2110	452.1	1326	1722	8
282	9	Wto	192	12.26363	12.47	12.5937	-6.22	0.99878	6.2832	23.51	59.282	6.8	58	701	1233.0	1804	2202	547.7	1431	1718	9
283	10	Śro	193	12.30328	13.03	13.0317	-6.44	0.99850	7.2826	23.38	58.615	0.2	47	703	1232.7	1802	2307	645.6	1526	1714	10
284	11	Czw	194	12.34294	13.19	13.0658	-7.07	0.99822	8.2850	21.58	57.981	1.2	36	705	1232.4	1759	****	744.4	1610	1710	11
285	12	Pią	195	12.38259	13.34	13.1039	-7.30	0.99795	9.2832	18.53	57.427	2.2	26	706	1232.2	1757	025	842.6	1643	1706	12
286	13	Sob	196	12.42225	13.48	13.1421	-7.52	0.99767	10.2646	14.34	57.005	3.2	16	708	1231.9	1755	150	939.2	1709	1703	13
287	14	Nie	197	12.46190	14.02	13.1804	-8.14	0.99739	11.2317	9.19	56.770	4.2	8	710	1231.7	1752	318	1033.9	1731	1659	14
288	15	Pon	198	12.50156	14.16	13.2147	-8.37	0.99710	12.1823	3.30	56.760	5.2	3	712	1231.5	1750	446	1127.0	1750	1655	15
289	16	Wto	199	12.54121	14.29	13.2531	-8.59	0.99682	13.1237	-2.31	56.997	6.2	0	714	1231.3	1748	613	1219.1	1809	1651	16
290	17	Śro	200	12.58087	14.41	13.2915	-9.21	0.99654	14.0641	-8.19	57.474	0.6	1	716	1231.1	1746	740	1311.0	1828	1647	17
291	18	Czw	201	13.02052	14.53	13.3260	-9.43	0.99626	15.0107	-13.34	58.156	1.6	4	717	1230.9	1743	906	1403.4	1849	1643	18
292	19	Pią	202	13.06018	15.04	13.3645	-10.04	0.99598	15.5615	-17.56	58.986	2.6	9	719	1230.7	1741	1029	1456.6	1915	1639	19
293	20	Sob	203	13.09583	15.14	13.4031	-10.26	0.99569	16.5160	-21.12	59.893	3.6	16	721	1230.5	1739	1147	1550.4	1948	1635	20
294	21	Nie	204	13.13549	15.24	13.4418	-10.47	0.99541	17.4755	-23.15	60.803	4.6	24	723	1230.3	1737	1257	1644.2	2028	1631	21
295	22	Pon	205	13.17515	15.33	13.4805	-11.09	0.99513	18.4317	-24.02	61.646	5.6	34	725	1230.2	1735	1356	1737.3	2119	1627	22
296	23	Wto	206	13.21480	15.42	13.5153	-11.30	0.99485	19.3720	-23.36	62.368	6.6	43	727	1230.0	1733	1443	1828.8	2217	1623	23
297	24	Śro	207	13.25446	15.50	13.5542	-11.51	0.99457	20.2927	-22.03	62.926	0.3	53	729	1229.9	1730	1519	1917.9	2322	1619	24
298	25	Czw	208	13.29412	15.57	13.5931	-12.11	0.99429	21.1923	-19.33	63.296	1.3	62	730	1229.8	1728	1547	2004.7	****	1615	25
299	26	Pią	209	13.33377	16.03	14.0321	-12.32	0.99401	22.0712	-16.15	63.471	2.3	71	732	1229.7	1726	1609	2049.2	030	1611	26
300	27	Sob	210	13.37343	16.09	14.0712	-12.52	0.99374	22.5315	-12.19	63.459	3.3	79	734	1229.6	1724	1627	2132.0	139	1607	27
301	28	Nie	211	13.41308	16.14	14.1104	-13.12	0.99347	23.3805	-7.53	63.278	4.3	86	736	1229.5	1722	1643	2213.8	248	1604	28
301	28	Nie	211	14.41407	16.14	14.1113	-13.13	0.99345	23.3956	-7.41	63.268	4.3	87	636	1129.5	1622	1543	2113.8	148	1504	28
302	29	Pon	212	14.45372	16.19	14.1506	-13.33	0.99319	0.2413	-2.54	62.943	5.3	93	638	1129.4	1620	1557	2155.3	257	1500	29
303	30	Wto	213	14.49337	16.22	14.1859	-13.53	0.99292	1.0845	2.04	62.515	6.3	97	640	1129.4	1618	1611	2237.4	407	1456	30
304	31	Śro	214	14.53303	16.25	14.2253	-14.12	0.99266	1.5417	7.02	62.019	7.3	99	642	1129.3	1616	1627	2321.0	519	1452	31

Fazy Księżyca [Dm, h.mm]: Pełn 2, 15.49 3kw 10, 6.20 Now 16, 21.23 1kw 24, 4.58 1kw 24, 3.58

PAŹDZIERNIK 2001 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST Zach (0^h UT) Dm	
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach		
1	4.51	20.19	9.09	18.31	4.18	17.49	15.36	22.27	22.46	15.25	20.53	13.07	17.00	2.22	16.21	0.59	11.60	21.52		
	12.508	-3.29	13.751	-14.77	10.965	7.97	18.951	-25.68	7.015	22.53	4.926	20.77	21.593	-15.12	20.562	-18.63	16.851	-12.27	0.65280	1
3	4.55	20.14	9.00	18.23	4.24	17.46	15.32	22.26	22.39	15.18	20.46	12.59	16.52	2.14	16.13	0.51	11.52	21.44		
	12.629	-4.06	13.742	-14.69	11.119	7.07	19.041	-25.50	7.029	22.51	4.925	20.76	21.590	-15.14	20.561	-18.63	16.854	-12.29	0.78421	3
5	4.59	20.09	8.48	18.15	4.30	17.42	15.28	22.25	22.32	15.10	20.38	12.51	16.44	2.06	16.05	0.43	11.45	21.36		
	12.750	-4.83	13.704	-14.34	11.272	6.15	19.132	-25.31	7.042	22.49	4.923	20.76	21.587	-15.15	20.560	-18.64	16.857	-12.31	0.91563	5
7	5.02	20.04	8.32	18.07	4.37	17.38	15.24	22.24	22.25	15.03	20.30	12.43	16.37	1.58	15.57	0.35	11.37	21.28		
	12.871	-5.60	13.635	-13.70	11.425	5.22	19.224	-25.11	7.054	22.48	4.920	20.75	21.584	-15.16	20.559	-18.64	16.860	-12.32	1.04705	7
9	5.06	19.59	8.13	17.59	4.43	17.34	15.20	22.24	22.18	14.56	20.22	12.35	16.29	1.50	15.49	0.27	11.29	21.20		
	12.993	-6.36	13.537	-12.76	11.578	4.29	19.316	-24.90	7.066	22.46	4.917	20.74	21.582	-15.17	20.558	-18.64	16.863	-12.34	1.17847	9
11	5.10	19.55	7.51	17.51	4.49	17.31	15.16	22.23	22.10	14.49	20.14	12.27	16.21	1.42	15.41	0.19	11.22	21.13		
	13.116	-7.12	13.416	-11.54	11.730	3.34	19.409	-24.67	7.076	22.45	4.914	20.73	21.580	-15.18	20.558	-18.65	16.866	-12.36	1.30989	11
13	5.13	19.50	7.27	17.43	4.56	17.27	15.11	22.23	22.03	14.41	20.06	12.18	16.13	1.34	15.33	0.11	11.14	21.05		
	13.239	-7.87	13.282	-10.11	11.883	2.38	19.502	-24.43	7.086	22.44	4.910	20.72	21.578	-15.19	20.557	-18.65	16.870	-12.38	1.44131	13
15	5.17	19.46	7.03	17.36	5.02	17.23	15.07	22.23	21.56	14.34	19.58	12.10	16.05	1.26	15.25	0.03	11.07	20.57		
	13.363	-8.61	13.150	-8.60	12.035	1.42	19.596	-24.17	7.095	22.43	4.906	20.71	21.576	-15.20	20.557	-18.65	16.873	-12.40	1.57273	15
17	5.21	19.41	6.40	17.29	5.09	17.19	15.03	22.22	21.49	14.26	19.50	12.02	15.57	1.18	15.18	23.51	10.59	20.49		
	13.487	-9.35	13.034	-7.15	12.187	0.45	19.690	-23.90	7.103	22.42	4.901	20.70	21.574	-15.20	20.557	-18.65	16.877	-12.41	1.70414	17
19	5.24	19.37	6.20	17.23	5.15	17.15	14.58	22.22	21.41	14.19	19.41	11.54	15.49	1.10	15.10	23.44	10.52	20.42		
	13.613	-10.07	12.950	-5.90	12.339	-0.53	19.784	-23.62	7.110	22.41	4.895	20.69	21.573	-15.21	20.557	-18.65	16.880	-12.43	1.83556	19
21	5.28	19.33	6.05	17.17	5.21	17.11	14.54	22.22	21.34	14.11	19.33	11.45	15.41	1.02	15.02	23.36	10.44	20.34		
	13.738	-10.79	12.905	-4.99	12.492	-1.50	19.879	-23.32	7.116	22.40	4.889	20.68	21.572	-15.21	20.557	-18.65	16.884	-12.45	1.96698	21
23	5.31	19.29	5.54	17.12	5.28	17.07	14.50	22.23	21.26	14.04	19.25	11.37	15.33	0.54	14.54	23.28	10.37	20.26		
	13.865	-11.49	12.904	-4.45	12.644	-2.48	19.974	-23.02	7.121	22.40	4.883	20.66	21.571	-15.22	20.558	-18.65	16.888	-12.46	2.09840	23
25	5.35	19.25	5.48	17.08	5.34	17.03	14.45	22.23	21.19	13.56	19.17	11.29	15.25	0.46	14.46	23.20	10.29	20.18		
	13.992	-12.19	12.945	-4.29	12.797	-3.45	20.069	-22.69	7.126	22.39	4.876	20.65	21.570	-15.22	20.558	-18.65	16.892	-12.48	2.22982	25
27	5.38	19.21	5.46	17.03	5.41	16.59	14.40	22.23	21.11	13.48	19.09	11.20	15.17	0.38	14.38	23.12	10.22	20.11		
	14.120	-12.87	13.024	-4.49	12.951	-4.42	20.165	-22.36	7.129	22.39	4.869	20.64	21.570	-15.22	20.559	-18.65	16.896	-12.50	2.36124	27
29	4.41	18.18	4.47	15.59	4.48	15.56	13.36	21.24	20.03	12.41	18.01	10.12	14.09	23.26	13.31	22.04	9.14	19.03		
	14.252	-13.55	13.137	-5.01	13.108	-5.41	20.262	-22.00	7.132	22.39	4.862	20.62	21.569	-15.22	20.560	-18.64	16.900	-12.52	2.49266	29
31	4.45	18.14	4.52	15.56	4.54	15.52	13.31	21.24	19.56	12.33	17.52	10.03	14.02	23.19	13.23	21.57	9.07	18.55		
	14.381	-14.20	13.273	-5.75	13.262	-6.37	20.358	-21.64	7.133	22.39	4.854	20.61	21.569	-15.22	20.560	-18.64	16.905	-12.53	2.62407	31

LISTOPAD 2001

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2452																			
305	1	Czw	215	14.57269	16.27	14.2647	-14.31	0.99240	2.4136	11.48	61.488	0.2	100	644	1129.3	1614	1644	*****	632	1448	1	
306	2	Pią	216	15.01234	16.28	14.3043	-14.51	0.99214	3.3121	16.08	60.948	1.2	98	645	1129.3	1612	1705	007.0	747	1444	2	
307	3	Sob	217	15.05200	16.28	14.3439	-15.09	0.99189	4.2401	19.47	60.421	2.2	95	647	1129.3	1611	1732	055.9	903	1440	3	
308	4	Nie	218	15.09165	16.28	14.3836	-15.28	0.99164	5.1938	22.28	59.916	3.2	89	649	1129.3	1609	1808	148.1	1018	1436	4	
309	5	Pon	219	15.13131	16.26	14.4234	-15.46	0.99140	6.1747	23.56	59.440	4.2	81	651	1129.3	1607	1856	243.4	1127	1432	5	
310	6	Wto	220	15.17097	16.24	14.4633	-16.04	0.99116	7.1725	24.01	58.995	5.2	72	653	1129.3	1605	1957	340.9	1225	1428	6	
311	7	Śro	221	15.21062	16.21	14.5032	-16.22	0.99092	8.1715	22.38	58.585	6.2	62	655	1129.4	1603	2110	439.1	1312	1424	7	
312	8	Czw	222	15.25028	16.17	14.5433	-16.39	0.99068	9.1603	19.52	58.219	7.2	51	657	1129.5	1602	2231	536.6	1347	1420	8	
313	9	Pią	223	15.28593	16.12	14.5834	-16.57	0.99045	10.1305	15.54	57.913	0.9	39	659	1129.5	1600	2356	632.2	1414	1416	9	
314	10	Sob	224	15.32559	16.07	15.0236	-17.14	0.99022	11.0813	10.59	57.693	1.9	28	700	1129.6	1558	****	725.7	1436	1412	10	
315	11	Nie	225	15.36524	16.00	15.0639	-17.30	0.98999	12.0150	5.26	57.586	2.9	18	702	1129.7	1557	121	817.4	1455	1408	11	
316	12	Pon	226	15.40490	15.53	15.1043	-17.46	0.98977	12.5436	-0.26	57.623	3.9	10	704	1129.9	1555	246	908.0	1513	1405	12	
317	13	Wto	227	15.44455	15.45	15.1448	-18.02	0.98954	13.4719	-6.15	57.826	4.9	4	706	1130.0	1553	411	958.4	1531	1401	13	
318	14	Śro	228	15.48421	15.36	15.1854	-18.18	0.98932	14.4043	-11.42	58.202	5.9	1	708	1130.2	1552	536	1049.6	1550	1357	14	
319	15	Czw	229	15.52386	15.26	15.2300	-18.34	0.98910	15.3515	-16.27	58.743	0.2	0	710	1130.3	1550	700	1142.0	1613	1353	15	
320	16	Pią	230	15.56352	15.15	15.2708	-18.49	0.98888	16.3102	-20.13	59.417	1.2	2	712	1130.5	1549	822	1235.8	1642	1349	16	
321	17	Sob	231	16.00317	15.03	15.3116	-19.03	0.98867	17.2740	-22.47	60.177	2.2	6	713	1130.7	1547	938	1330.5	1719	1345	17	
322	18	Nie	232	16.04283	14.51	15.3525	-19.18	0.98845	18.2418	-24.04	60.966	3.2	11	715	1130.9	1546	1044	1425.1	1805	1341	18	
323	19	Pon	233	16.08249	14.38	15.3935	-19.32	0.98824	19.1956	-24.03	61.722	4.2	19	717	1131.1	1545	1138	1518.5	1901	1337	19	
324	20	Wto	234	16.12214	14.23	15.4345	-19.45	0.98803	20.1340	-22.50	62.386	5.2	27	719	1131.4	1543	1219	1609.7	2005	1333	20	
325	21	Śro	235	16.16180	14.09	15.4757	-19.59	0.98783	21.0458	-20.34	62.910	6.2	36	720	1131.6	1542	1250	1658.2	2113	1329	21	
326	22	Czw	236	16.20145	13.53	15.5209	-20.12	0.98762	21.5345	-17.28	63.254	7.2	45	722	1131.9	1541	1314	1743.9	2222	1325	22	
327	23	Pią	237	16.24111	13.37	15.5622	-20.24	0.98742	22.4022	-13.40	63.399	0.5	55	724	1132.1	1540	1334	1827.4	2332	1321	23	
328	24	Sob	238	16.28077	13.19	16.0036	-20.36	0.98723	23.2522	-9.21	63.338	1.5	64	726	1132.4	1539	1350	1909.3	****	1317	24	
329	25	Nie	239	16.32042	13.01	16.0450	-20.48	0.98704	0.0929	-4.40	63.082	2.5	73	727	1132.7	1538	1404	1950.5	041	1313	25	
330	26	Pon	240	16.36007	12.43	16.0905	-20.60	0.98685	0.5335	0.15	62.656	3.5	81	729	1133.0	1537	1418	2032.0	150	1310	26	
331	27	Wto	241	16.39573	12.23	16.1321	-21.11	0.98667	1.3830	5.15	62.097	4.5	88	730	1133.4	1536	1433	2114.7	300	1306	27	
332	28	Śro	242	16.43539	12.03	16.1738	-21.21	0.98649	2.2508	10.09	61.453	5.5	94	732	1133.7	1535	1449	2159.7	413	1302	28	
333	29	Czw	243	16.47504	11.43	16.2155	-21.32	0.98632	3.1418	14.44	60.774	6.5	98	734	1134.0	1534	1508	2247.8	528	1258	29	
334	30	Pią	244	16.51470	11.21	16.2613	-21.41	0.98615	4.0639	18.43	60.110	7.5	100	735	1134.4	1533	1533	2339.6	645	1254	30	

Fazy Księżyca [Dm, h.mm]: Pełn 1, 6.41 3kw 8, 13.21 Now 15, 7.40 1kw 23, 0.21 Pełn 30, 21.49

LISTOPAD 2001 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.46	18.12	4.55	15.54	4.57	15.50	13.29	21.24	19.52	12.29	17.48	9.59	13.58	23.15	13.19	21.53	9.03	18.51		
	14.446	-14.52	13.349	-6.19	13.339	-6.84	20.405	-21.46	7.134	22.39	4.849	20.60	21.569	-15.22	20.561	-18.64	16.907	-12.54	2.68978	1
3	4.50	18.09	5.02	15.50	5.04	15.46	13.24	21.25	19.44	12.21	17.40	9.51	13.50	23.07	13.11	21.45	8.55	18.44		
	14.577	-15.15	13.512	-7.19	13.495	-7.79	20.501	-21.08	7.134	22.40	4.841	20.58	21.570	-15.22	20.562	-18.64	16.911	-12.56	2.82120	3
5	4.53	18.06	5.10	15.47	5.11	15.42	13.19	21.25	19.36	12.13	17.32	9.42	13.42	22.59	13.03	21.37	8.48	18.36		
	14.709	-15.77	13.687	-8.28	13.651	-8.72	20.596	-20.69	7.133	22.40	4.832	20.57	21.570	-15.21	20.564	-18.63	16.916	-12.57	2.95263	5
7	4.56	18.03	5.20	15.44	5.17	15.39	13.14	21.26	19.28	12.05	17.23	9.34	13.34	22.51	12.55	21.30	8.40	18.28		
	14.842	-16.36	13.872	-9.45	13.808	-9.65	20.691	-20.29	7.131	22.41	4.823	20.55	21.571	-15.21	20.565	-18.63	16.920	-12.59	3.08405	7
9	4.59	18.00	5.30	15.41	5.24	15.35	13.09	21.27	19.20	11.57	17.15	9.25	13.26	22.43	12.48	21.22	8.33	18.21		
	14.976	-16.94	14.063	-10.66	13.966	-10.56	20.787	-19.87	7.128	22.42	4.813	20.53	21.572	-15.20	20.567	-18.62	16.925	-12.61	3.21547	9
11	5.02	17.57	5.41	15.38	5.31	15.32	13.04	21.27	19.12	11.49	17.07	9.16	13.18	22.36	12.40	21.14	8.25	18.13		
	15.111	-17.50	14.260	-11.87	14.125	-11.45	20.882	-19.45	7.125	22.43	4.803	20.51	21.573	-15.20	20.569	-18.61	16.929	-12.62	3.34689	11
13	5.05	17.55	5.52	15.35	5.37	15.29	12.59	21.28	19.03	11.41	16.58	9.08	13.11	22.28	12.32	21.06	8.18	18.05		
	15.247	-18.04	14.460	-13.09	14.285	-12.32	20.977	-19.01	7.120	22.44	4.793	20.50	21.574	-15.19	20.571	-18.61	16.934	-12.64	3.47830	13
15	5.08	17.52	6.04	15.32	5.44	15.25	12.54	21.29	18.55	11.33	16.50	8.59	13.03	22.20	12.24	20.59	8.10	17.58		
	15.383	-18.56	14.663	-14.28	14.446	-13.18	21.072	-18.56	7.114	22.45	4.783	20.48	21.576	-15.18	20.573	-18.60	16.939	-12.65	3.60972	15
17	5.11	17.50	6.15	15.29	5.51	15.22	12.49	21.30	18.47	11.25	16.42	8.51	12.55	22.12	12.16	20.51	8.03	17.50		
	15.521	-19.06	14.869	-15.44	14.608	-14.01	21.166	-18.10	7.108	22.47	4.772	20.46	21.578	-15.17	20.575	-18.59	16.944	-12.67	3.74114	17
19	5.14	17.48	6.27	15.27	5.58	15.19	12.43	21.30	18.38	11.17	16.33	8.42	12.47	22.05	12.09	20.43	7.55	17.42		
	15.660	-19.53	15.077	-16.56	14.772	-14.83	21.261	-17.63	7.100	22.48	4.761	20.44	21.580	-15.16	20.577	-18.59	16.949	-12.68	3.87257	19
21	5.17	17.46	6.38	15.25	6.05	15.17	12.38	21.31	18.30	11.09	16.25	8.33	12.39	21.57	12.01	20.36	7.48	17.35		
	15.799	-19.98	15.287	-17.64	14.936	-15.61	21.355	-17.15	7.092	22.50	4.750	20.42	21.582	-15.15	20.580	-18.58	16.954	-12.69	4.00399	21
23	5.20	17.45	6.50	15.23	6.11	15.14	12.33	21.32	18.21	11.00	16.17	8.25	12.32	21.50	11.53	20.28	7.40	17.27		
	15.939	-20.40	15.499	-18.66	15.102	-16.37	21.449	-16.66	7.082	22.52	4.739	20.40	21.585	-15.13	20.582	-18.57	16.959	-12.71	4.13541	23
25	5.23	17.43	7.01	15.22	6.18	15.12	12.28	21.33	18.13	10.52	16.08	8.16	12.24	21.42	11.45	20.20	7.33	17.19		
	16.081	-20.80	15.713	-19.62	15.270	-17.10	21.543	-16.16	7.072	22.54	4.728	20.38	21.587	-15.12	20.585	-18.56	16.964	-12.72	4.26683	25
27	5.25	17.42	7.12	15.21	6.25	15.09	12.22	21.34	18.04	10.44	15.60	8.07	12.16	21.34	11.38	20.13	7.25	17.12		
	16.223	-21.18	15.929	-20.52	15.438	-17.80	21.637	-15.65	7.061	22.56	4.716	20.36	21.590	-15.10	20.588	-18.55	16.969	-12.73	4.39825	27
29	5.28	17.41	7.23	15.20	6.31	15.07	12.17	21.35	17.55	10.35	15.51	7.59	12.08	21.27	11.30	20.05	7.18	17.04		
	16.365	-21.53	16.147	-21.36	15.608	-18.47	21.730	-15.14	7.049	22.58	4.705	20.34	21.593	-15.09	20.591	-18.54	16.974	-12.75	4.52967	29

GRUDZIEŃ 2001

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°/′	j astr	h.mmss	°/′	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2452																			
335	1	Sob	245	16.55436	10.59	16.3032	-21.51	0.98599	5.0224	21.49	59.505	0.6	100	737	1134.8	1533	1605	*****	802	1250	1	
336	2	Nie	246	16.59401	10.36	16.3451	-21.60	0.98584	6.0112	23.44	58.992	1.6	97	738	1135.1	1532	1649	035.1	916	1246	2	
337	3	Pon	247	17.03367	10.13	16.3911	-22.08	0.98569	7.0157	24.13	58.589	2.6	92	740	1135.5	1531	1747	133.5	1020	1242	3	
338	4	Wto	248	17.07332	9.49	16.4332	-22.17	0.98554	8.0305	23.12	58.300	3.6	85	741	1135.9	1531	1858	233.1	1112	1238	4	
339	5	Śro	249	17.11298	9.24	16.4753	-22.24	0.98540	9.0301	20.44	58.121	4.6	76	742	1136.3	1530	2019	332.0	1151	1234	5	
340	6	Czw	250	17.15264	8.59	16.5214	-22.32	0.98527	10.0043	16.60	58.038	5.6	65	744	1136.8	1530	2143	428.7	1221	1230	6	
341	7	Pią	251	17.19229	8.33	16.5637	-22.38	0.98514	10.5556	12.18	58.038	6.6	54	745	1137.2	1529	2307	522.7	1244	1226	7	
342	8	Sob	252	17.23195	8.07	17.0059	-22.45	0.98502	11.4859	6.56	58.112	0.6	43	746	1137.6	1529	****	614.0	1303	1222	8	
343	9	Nie	253	17.27160	7.41	17.0523	-22.51	0.98490	12.4040	1.15	58.256	1.6	32	747	1138.1	1529	030	703.7	1320	1218	9	
344	10	Pon	254	17.31126	7.14	17.0946	-22.56	0.98478	13.3151	-4.29	58.473	2.6	22	748	1138.5	1528	153	752.5	1337	1214	10	
345	11	Wto	255	17.35091	6.46	17.1410	-23.01	0.98467	14.2329	-9.57	58.770	3.6	13	749	1139.0	1528	315	841.7	1355	1211	11	
346	12	Śro	256	17.39057	6.18	17.1835	-23.06	0.98456	15.1614	-14.52	59.154	4.6	7	751	1139.4	1528	437	932.1	1415	1207	12	
347	13	Czw	257	17.43023	5.50	17.2260	-23.10	0.98446	16.1032	-18.58	59.624	5.6	2	752	1139.9	1528	559	1024.1	1441	1203	13	
348	14	Pią	258	17.46588	5.21	17.2725	-23.14	0.98436	17.0615	-21.59	60.173	6.6	0	752	1140.4	1528	717	1117.8	1513	1159	14	
349	15	Sob	259	17.50554	4.52	17.3150	-23.17	0.98426	18.0248	-23.46	60.780	0.6	0	753	1140.9	1528	827	1212.4	1555	1155	15	
350	16	Nie	260	17.54519	4.23	17.3616	-23.20	0.98417	18.5907	-24.14	61.412	1.6	3	754	1141.4	1528	927	1306.7	1647	1151	16	
351	17	Pon	261	17.58485	3.54	17.4042	-23.22	0.98408	19.5406	-23.27	62.028	2.6	7	755	1141.9	1529	1015	1359.5	1748	1147	17	
352	18	Wto	262	18.02451	3.24	17.4508	-23.24	0.98399	20.4652	-21.33	62.581	3.6	13	756	1142.3	1529	1050	1449.7	1855	1143	18	
353	19	Śro	263	18.06416	2.54	17.4934	-23.25	0.98391	21.3701	-18.42	63.027	4.6	20	756	1142.8	1529	1117	1537.1	2005	1139	19	
354	20	Czw	264	18.10382	2.25	17.5401	-23.26	0.98383	22.2437	-15.06	63.324	5.6	28	757	1143.3	1530	1139	1621.7	2115	1135	20	
355	21	Pią	265	18.14347	1.55	17.5827	-23.26	0.98375	23.1009	-10.56	63.440	6.6	37	758	1143.8	1530	1156	1704.2	2224	1131	21	
356	22	Sob	266	18.18313	1.25	18.0253	-23.26	0.98368	23.5417	-6.23	63.355	7.6	46	758	1144.3	1531	1211	1745.3	2332	1127	22	
357	23	Nie	267	18.22278	0.55	18.0720	-23.26	0.98362	0.3753	-1.34	63.065	0.6	56	758	1144.8	1531	1225	1826.1	****	1123	23	
358	24	Pon	268	18.26244	0.25	18.1146	-23.25	0.98356	1.2150	3.22	62.581	1.6	65	759	1145.3	1532	1238	1907.5	041	1119	24	
359	25	Wto	269	18.30209	-0.04	18.1613	-23.23	0.98350	2.0706	8.16	61.932	2.6	74	759	1145.8	1533	1253	1950.7	152	1115	25	
360	26	Śro	270	18.34175	-0.34	18.2039	-23.21	0.98345	2.5439	12.58	61.162	3.6	82	759	1146.3	1533	1311	2036.8	305	1112	26	
361	27	Czw	271	18.38141	-1.04	18.2505	-23.19	0.98341	3.4522	17.12	60.328	4.6	90	800	1146.8	1534	1332	2126.6	420	1108	27	
362	28	Pią	272	18.42106	-1.33	18.2931	-23.16	0.98338	4.3950	20.42	59.495	5.6	95	800	1147.3	1535	1401	2220.6	538	1104	28	
363	29	Sob	273	18.46072	-2.02	18.3356	-23.13	0.98335	5.3806	23.08	58.729	6.6	99	800	1147.8	1536	1439	2318.7	655	1100	29	
364	30	Nie	274	18.50038	-2.31	18.3822	-23.09	0.98332	6.3925	24.13	58.091	0.0	100	800	1148.3	1537	1532	*****	805	1056	30	
365	31	Pon	275	18.54003	-2.60	18.4247	-23.04	0.98331	7.4211	23.43	57.626	1.0	99	800	1148.7	1538	1640	019.5	904	1052	31	

Fazy Księżyca [Dm, h.mm]: Pełn 0, 21.49 3kw 7, 20.52 Now 14, 21.47 1kw 22, 21.56 Pełn 30, 11.41

GRUDZIEŃ 2001 (c.d.)

Świty, zmiernicy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	5.30	17.40	7.34	15.20	6.38	15.06	12.11	21.35	17.46	10.27	15.43	7.50	12.00	21.19	11.22	19.58	7.10	16.57		
	16.509	-21.85	16.367	-22.12	15.780	-19.11	21.823	-14.61	7.037	22.60	4.693	20.32	21.597	-15.07	20.594	-18.53	16.979	-12.76	4.66109	1
3	5.33	17.39	7.44	15.20	6.44	15.04	12.06	21.36	17.38	10.18	15.34	7.41	11.53	21.12	11.14	19.50	7.03	16.49		
	16.653	-22.14	16.588	-22.81	15.952	-19.71	21.916	-14.08	7.023	22.63	4.682	20.30	21.600	-15.05	20.598	-18.51	16.984	-12.77	4.79251	3
5	5.35	17.38	7.54	15.21	6.51	15.03	12.00	21.37	17.29	10.10	15.26	7.33	11.45	21.04	11.07	19.42	6.55	16.41		
	16.798	-22.40	16.812	-23.43	16.126	-20.27	22.009	-13.54	7.009	22.65	4.670	20.29	21.604	-15.03	20.601	-18.50	16.989	-12.78	4.92394	5
7	5.37	17.38	8.04	15.23	6.57	15.02	11.55	21.38	17.20	10.01	15.18	7.24	11.37	20.57	10.59	19.35	6.48	16.34		
	16.944	-22.64	17.038	-23.96	16.301	-20.80	22.101	-12.99	6.994	22.68	4.658	20.27	21.608	-15.01	20.605	-18.49	16.994	-12.79	5.05536	7
9	5.39	17.38	8.13	15.25	7.03	15.01	11.49	21.39	17.11	9.53	15.09	7.15	11.29	20.49	10.51	19.27	6.40	16.26		
	17.090	-22.85	17.265	-24.42	16.478	-21.28	22.193	-12.44	6.979	22.70	4.647	20.25	21.612	-14.99	20.608	-18.48	16.999	-12.80	5.18677	9
11	5.41	17.38	8.22	15.28	7.09	15.01	11.44	21.40	17.02	9.44	15.01	7.06	11.22	20.42	10.43	19.20	6.33	16.18		
	17.236	-23.02	17.494	-24.78	16.655	-21.73	22.285	-11.88	6.963	22.73	4.635	20.23	21.616	-14.97	20.612	-18.46	17.005	-12.81	5.31819	11
13	5.43	17.38	8.30	15.32	7.15	15.01	11.38	21.41	16.53	9.35	14.52	6.58	11.14	20.34	10.36	19.12	6.25	16.11		
	17.383	-23.17	17.725	-25.06	16.834	-22.13	22.376	-11.31	6.946	22.76	4.624	20.21	21.621	-14.94	20.616	-18.45	17.010	-12.82	5.44961	13
15	5.44	17.38	8.38	15.36	7.20	15.01	11.32	21.41	16.43	9.27	14.44	6.49	11.06	20.27	10.28	19.05	6.18	16.03		
	17.531	-23.28	17.957	-25.25	17.014	-22.48	22.468	-10.74	6.929	22.79	4.613	20.19	21.625	-14.92	20.620	-18.43	17.015	-12.83	5.58104	15
17	5.46	17.39	8.45	15.41	7.25	15.02	11.27	21.42	16.34	9.18	14.36	6.40	10.58	20.19	10.20	18.57	6.10	15.56		
	17.678	-23.36	18.190	-25.35	17.194	-22.80	22.559	-10.16	6.911	22.81	4.602	20.17	21.630	-14.89	20.624	-18.42	17.020	-12.84	5.71246	17
19	5.47	17.40	8.51	15.48	7.30	15.03	11.21	21.43	16.25	9.09	14.27	6.32	10.51	20.12	10.13	18.50	6.03	15.48		
	17.826	-23.42	18.424	-25.35	17.375	-23.06	22.650	-9.58	6.893	22.84	4.591	20.16	21.635	-14.87	20.628	-18.40	17.025	-12.85	5.84388	19
21	5.48	17.41	8.56	15.55	7.35	15.04	11.15	21.44	16.16	9.01	14.19	6.23	10.43	20.05	10.05	18.42	5.55	15.40		
	17.974	-23.44	18.658	-25.24	17.557	-23.28	22.740	-8.99	6.875	22.87	4.580	20.14	21.640	-14.84	20.633	-18.39	17.030	-12.86	5.97530	21
23	5.49	17.42	9.01	16.02	7.39	15.06	11.09	21.45	16.07	8.52	14.10	6.15	10.35	19.57	9.57	18.35	5.48	15.33		
	18.122	-23.43	18.892	-25.04	17.740	-23.46	22.830	-8.40	6.856	22.90	4.570	20.12	21.646	-14.81	20.637	-18.37	17.035	-12.86	6.10672	23
25	5.50	17.43	9.04	16.11	7.43	15.08	11.04	21.46	15.58	8.43	14.02	6.06	10.28	19.50	9.49	18.27	5.40	15.25		
	18.270	-23.39	19.124	-24.74	17.923	-23.58	22.921	-7.80	6.837	22.93	4.560	20.11	21.651	-14.79	20.641	-18.36	17.040	-12.87	6.23814	25
27	5.50	17.44	9.07	16.20	7.47	15.10	10.58	21.46	15.48	8.34	13.54	5.57	10.20	19.42	9.42	18.20	5.33	15.18		
	18.418	-23.31	19.355	-24.33	18.106	-23.66	23.010	-7.20	6.817	22.95	4.550	20.09	21.657	-14.76	20.646	-18.34	17.045	-12.88	6.36956	27
29	5.51	17.46	9.09	16.30	7.50	15.13	10.52	21.47	15.39	8.25	13.45	5.49	10.12	19.35	9.34	18.12	5.25	15.10		
	18.566	-23.21	19.582	-23.83	18.289	-23.68	23.100	-6.60	6.798	22.98	4.540	20.08	21.663	-14.73	20.650	-18.32	17.050	-12.89	6.50099	29
31	5.51	17.48	9.10	16.40	7.53	15.17	10.46	21.48	15.30	8.17	13.37	5.40	10.05	19.28	9.26	18.05	5.18	15.02		
	18.713	-23.07	19.806	-23.22	18.472	-23.66	23.190	-5.99	6.778	23.01	4.531	20.07	21.669	-14.70	20.655	-18.31	17.055	-12.89	6.63241	31

Święta państwowe i kościelne w Polsce oraz inne ważniejsze dni w roku 2001

Nowy Rok	Pon	1 styczeń	Dzień Dziecka	Pią	1 czerwiec
Najświętszej Maryi Panny Rodzicielki	Pon	1 styczeń	Zesłania Ducha Świętego	Nie	3 czerwiec
Objawienia Pańskiego (Trzech Króli)	Sob	6 styczeń	Dzień Dziękczynienia	Nie	3 czerwiec
Juliański Nowy Rok	Nie	14 styczeń	Trójcy Najświętszej	Nie	10 czerwiec
Dzień Babci	Nie	21 styczeń	Boże Ciało	Czw	14 czerwiec
Dzień Dziadka	Pon	22 styczeń	Najświętszego Serca Pana Jezusa	Pią	22 czerwiec
Ofiarowania Pańskiego	Pią	2 luty	Dzień Ojca	Sob	23 czerwiec
Matki Boskiej Gromnicznej	Pią	2 luty	Noc Świętojańska	Sob	23 czerwiec
Walentynki	Śro	14 luty	Św. Piotra i Pawła	Pią	29 czerwiec
Święto UMK	Pon	19 luty	Wniebowzięcia N.M.P.	Śro	15 sierpień
Tłusty czwartek	Czw	22 luty	Święto Wojska Polskiego	Śro	15 sierpień
Środa Popielcowa	Śro	28 luty	Dzień Solidarności i Wolności	Pią	31 sierpień
Dzień Kobiet	Czw	8 marzec	Dzień Programisty	Czw	13 wrzesień
Narodowy Dzień Życia	Sob	24 marzec	Dożynki – Święto Plonów	Nie	23 wrzesień
Niedziela Palmowa	Nie	8 kwiecień	Dzień Papieski	Nie	14 październik
Niedziela Wielkanocna	Nie	15 kwiecień	Dzień Edukacji Narodowej	Nie	14 październik
Niedziela Miłosierdzia Bożego	Nie	22 kwiecień	Dzień Papieża Jana Pawła II	Wto	16 październik
Święto Pracy	Wto	1 maj	Wszystkich Świętych	Czw	1 listopad
Dzień Flagi Rzeczypospolitej Polskiej	Śro	2 maj	Zaduszki	Pią	2 listopad
Najświętsza Maryja Królowa Polski	Czw	3 maj	Święto Niepodległości	Nie	11 listopad
Święto Konstytucji 3 Maja	Czw	3 maj	Pierwsza niedziela Adventu	Nie	2 grudzień
Dzień Polskiej Niezapominajki	Wto	15 maj	Niepokalane Poczęcie N.M.P.	Sob	8 grudzień
Wniebowstąpienia Pańskiego	Czw	24 maj	Boże Narodzenie	Wto	25 grudzień
Dzień Matki	Sob	26 maj	Sylwester	Pon	31 grudzień

Kalendarz astronomiczny 2002

PIWNICE, CA UMK

Współrzędne geograficzne: 18.5641°E 53.0955°N, Nr strefy czasowej (> 0 , gdy na wschód) = 1 (CSE)

Kalendarz jest gregoriańskim i jest oparty na efemerydach Układu Słonecznego obliczanych z dokładnością 1' (Słońce 2'', Księżyc 10'', Pluton 15'). Czas gwiazdowy ma dokładność około 0.1 s. Wschody i zachody obliczono z uwzględnieniem horyzontalnej refrakcji astronomicznej (34'), rozciągłości Słońca lub Księżyca i paralaksy horyzontalnej Księżyca. Dla dat odległych o więcej niż ok. 300 lat od roku 1950 dokładności położenia planet są gorsze niż 1'!
(Kalendarz ten opracowano [KMB] w Katedrze Radioastronomii CA UMK, Toruń—Piwnice. Oblicz. dnia 7.10.2010 r.)

Data Wielkanocy: **2002 MARZEC 31**

Dla całego roku przyjęto: TDT – UT = 64 s

Pory roku [miesiąc dzień, godz. mm] (czas zimowy): Wiosna **III 20, 20.16**, Lato **VI 21, 14.25**, Jesień **IX 23, 5.55**, Zima **XII 22, 2.14**

Dane w czasie letnim odróżniono kolorem brązowym; czas ten obowiązuje **od 31 marca do 27 października 2002 r.**

Oznaczenia:

Dr — dzień 2002 roku (1 stycznia Dr = 1)

Dm — dzień miesiąca

Dt — dzień tygodnia

JD — data juliańska modulo 1000 o 12^h UT

(po nagłówku: Entier(JD/1000) dla Dm = 1)

ST — prawdziwy czas gwiazdowy

$\Delta\alpha$ — różnica czasu (czas słoneczny prawdziwy minus średni)

α — rektascensja (Słońca lub Księżyca)

δ — deklinacja (Słońca lub Księżyca)

R — odległość (Słońca lub Księżyca)

j_{astr} — jednostka astronomiczna

ρ_{\oplus} — promień Ziemi

Faza \leftarrow dni po kwadrze i % oświetlonej części tarczy Księżyca

Wsch — wschód (Słońca, Księżyca lub planety)

Gór — górowanie czyli tranzyt (Gal. = centrum Galaktyki)

Zach — zachód (Słońca, Księżyca lub planety)

STYCZEŃ 2002

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)											Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2452																			
1	1	Wto	276	18.57569	-3.28	18.4712	-22.60	0.98330	8.4430	21.39	57.359	2.0	95	800	1149.2	1539	1800	120.9	949	1048	1	
2	2	Śro	277	19.01534	-3.56	18.5137	-22.55	0.98329	9.4444	18.09	57.293	3.0	88	800	1149.7	1540	1926	220.5	1023	1044	2	
3	3	Czw	278	19.05500	-4.24	18.5601	-22.49	0.98329	10.4207	13.33	57.408	4.0	79	759	1150.1	1541	2053	317.3	1049	1040	3	
4	4	Pią	279	19.09465	-4.51	19.0025	-22.43	0.98330	11.3642	8.13	57.671	5.0	69	759	1150.6	1542	2218	410.7	1110	1036	4	
5	5	Sob	280	19.13431	-5.18	19.0448	-22.36	0.98331	12.2907	2.31	58.043	6.0	58	759	1151.0	1544	2341	501.5	1127	1032	5	
6	6	Nie	281	19.17396	-5.44	19.0911	-22.29	0.98333	13.2020	-3.14	58.487	0.3	47	758	1151.5	1545	****	550.6	1144	1028	6	
7	7	Pon	282	19.21362	-6.11	19.1334	-22.22	0.98336	14.1118	-8.44	58.973	1.3	36	758	1151.9	1546	103	639.2	1202	1024	7	
8	8	Wto	283	19.25327	-6.36	19.1756	-22.14	0.98339	15.0253	-13.44	59.481	2.3	26	757	1152.3	1548	224	728.3	1221	1020	8	
9	9	Śro	284	19.29293	-7.01	19.2218	-22.06	0.98342	15.5542	-17.58	59.998	3.3	17	757	1152.8	1549	344	818.6	1244	1017	9	
10	10	Czw	285	19.33259	-7.26	19.2639	-21.57	0.98346	16.4956	-21.14	60.519	4.3	10	756	1153.2	1551	502	910.5	1312	1013	10	
11	11	Pią	286	19.37224	-7.50	19.3060	-21.48	0.98350	17.4519	-23.21	61.043	5.3	4	755	1153.6	1552	614	1003.8	1350	1009	11	
12	12	Sob	287	19.41190	-8.13	19.3520	-21.38	0.98355	18.4104	-24.13	61.562	6.3	1	755	1154.0	1554	717	1057.5	1437	1005	12	
13	13	Nie	288	19.45156	-8.36	19.3939	-21.28	0.98360	19.3609	-23.50	62.068	7.3	0	754	1154.4	1555	809	1150.6	1535	1001	13	
14	14	Pon	289	19.49121	-8.59	19.4358	-21.17	0.98365	20.2934	-22.16	62.542	0.9	1	753	1154.7	1557	849	1241.8	1640	957	14	
15	15	Wto	290	19.53087	-9.20	19.4816	-21.07	0.98371	21.2039	-19.41	62.960	1.9	3	752	1155.1	1558	919	1330.4	1749	953	15	
16	16	Śro	291	19.57052	-9.41	19.5233	-20.55	0.98377	22.0912	-16.17	63.293	2.9	8	751	1155.4	1600	942	1416.2	1859	949	16	
17	17	Czw	292	20.01018	-10.01	19.5650	-20.44	0.98383	22.5528	-12.16	63.509	3.9	14	750	1155.8	1602	1001	1459.6	2009	945	17	
18	18	Pią	293	20.04583	-10.21	20.0106	-20.32	0.98390	23.3958	-7.49	63.577	4.9	21	749	1156.1	1603	1017	1541.1	2118	941	18	
19	19	Sob	294	20.08549	-10.39	20.0521	-20.19	0.98397	0.2325	-3.05	63.471	5.9	29	748	1156.4	1605	1031	1621.7	2226	937	19	
20	20	Nie	295	20.12514	-10.57	20.0936	-20.06	0.98405	1.0642	1.47	63.176	6.9	38	747	1156.7	1607	1044	1702.2	2335	933	20	
21	21	Pon	296	20.16480	-11.15	20.1350	-19.53	0.98413	1.5042	6.39	62.688	7.9	47	746	1157.0	1609	1058	1743.7	****	929	21	
22	22	Wto	297	20.20445	-11.31	20.1803	-19.40	0.98421	2.3623	11.20	62.019	0.7	57	745	1157.3	1611	1114	1827.3	045	925	22	
23	23	Śro	298	20.24411	-11.47	20.2215	-19.26	0.98431	3.2443	15.41	61.200	1.7	67	743	1157.5	1612	1133	1914.1	157	921	23	
24	24	Czw	299	20.28377	-12.01	20.2626	-19.11	0.98440	4.1632	19.26	60.277	2.7	76	742	1157.8	1614	1157	2004.9	313	918	24	
25	25	Pią	300	20.32342	-12.15	20.3037	-18.57	0.98450	5.1220	22.18	59.313	3.7	85	741	1158.0	1616	1229	2100.3	429	914	25	
26	26	Sob	301	20.36308	-12.29	20.3447	-18.42	0.98461	6.1157	23.58	58.385	4.7	92	739	1158.2	1618	1314	2159.6	542	910	26	
27	27	Nie	302	20.40274	-12.41	20.3856	-18.26	0.98473	7.1422	24.09	57.570	5.7	97	738	1158.4	1620	1415	2301.3	647	906	27	
28	28	Pon	303	20.44239	-12.53	20.4304	-18.11	0.98485	8.1752	22.42	56.943	6.7	100	736	1158.6	1622	1531	****	740	902	28	
29	29	Wto	304	20.48205	-13.04	20.4711	-17.55	0.98497	9.2028	19.41	56.558	0.5	100	735	1158.8	1624	1657	003.2	819	858	29	
30	30	Śro	305	20.52170	-13.14	20.5118	-17.38	0.98510	10.2047	15.19	56.443	1.5	97	733	1159.0	1625	1827	103.2	849	854	30	
31	31	Czw	306	20.56136	-13.23	20.5523	-17.22	0.98524	11.1817	9.59	56.596	2.5	91	732	1159.1	1627	1957	200.1	913	850	31	

Fazy Księżyca [Dm, h.mm]: 3kw 6, 4.55 Nów 13, 14.29 1kw 21, 18.46 Pełn 28, 23.50

STYCZEŃ 2002 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	5.51	17.48	9.10	16.45	7.55	15.18	10.43	21.48	15.25	8.12	13.33	5.36	10.01	19.24	9.23	18.01	5.14	14.59		
	18.787	-23.00	19.915	-22.88	18.564	-23.63	23.234	-5.69	6.769	23.02	4.527	20.06	21.672	-14.68	20.657	-18.30	17.057	-12.89	6.69812	1
3	5.51	17.50	9.09	16.55	7.57	15.22	10.38	21.49	15.16	8.03	13.25	5.28	9.53	19.17	9.15	17.53	5.06	14.51		
	18.934	-22.81	20.128	-22.13	18.747	-23.54	23.323	-5.08	6.749	23.05	4.518	20.05	21.678	-14.65	20.662	-18.28	17.062	-12.90	6.82954	3
5	5.51	17.52	9.08	17.05	7.59	15.26	10.32	21.50	15.07	7.54	13.16	5.19	9.45	19.09	9.07	17.46	4.59	14.43		
	19.080	-22.60	20.331	-21.30	18.930	-23.39	23.412	-4.47	6.730	23.07	4.509	20.04	21.684	-14.62	20.667	-18.26	17.067	-12.90	6.96096	5
7	5.51	17.55	9.05	17.15	8.01	15.31	10.26	21.51	14.58	7.46	13.08	5.11	9.38	19.02	8.59	17.39	4.51	14.36		
	19.226	-22.36	20.522	-20.41	19.112	-23.20	23.501	-3.86	6.710	23.10	4.501	20.03	21.690	-14.59	20.672	-18.25	17.071	-12.91	7.09238	7
9	5.50	17.57	9.01	17.24	8.02	15.36	10.20	21.51	14.48	7.37	12.60	5.02	9.30	18.55	8.52	17.31	4.44	14.28		
	19.372	-22.09	20.695	-19.46	19.293	-22.96	23.590	-3.25	6.691	23.12	4.494	20.02	21.697	-14.55	20.677	-18.23	17.076	-12.91	7.22380	9
11	5.49	17.59	8.56	17.32	8.03	15.41	10.14	21.52	14.39	7.28	12.52	4.54	9.22	18.48	8.44	17.24	4.36	14.21		
	19.517	-21.79	20.846	-18.49	19.474	-22.67	23.679	-2.64	6.672	23.14	4.487	20.01	21.703	-14.52	20.682	-18.21	17.080	-12.91	7.35522	11
13	5.48	18.02	8.49	17.37	8.03	15.46	10.09	21.53	14.30	7.19	12.43	4.46	9.15	18.40	8.36	17.16	4.29	14.13		
	19.661	-21.47	20.969	-17.53	19.654	-22.34	23.767	-2.02	6.654	23.17	4.480	20.00	21.710	-14.48	20.687	-18.19	17.085	-12.92	7.48665	13
15	5.47	18.04	8.41	17.40	8.03	15.52	10.03	21.53	14.21	7.10	12.35	4.38	9.07	18.33	8.29	17.09	4.21	14.05		
	19.804	-21.11	21.057	-16.64	19.833	-21.96	23.856	-1.41	6.635	23.19	4.474	20.00	21.717	-14.45	20.692	-18.17	17.089	-12.92	7.61807	15
17	5.46	18.07	8.31	17.40	8.03	15.57	9.57	21.54	14.12	7.02	12.27	4.29	8.59	18.26	8.21	17.01	4.13	13.58		
	19.947	-20.73	21.103	-15.85	20.011	-21.54	23.944	-0.80	6.617	23.21	4.468	19.99	21.724	-14.41	20.697	-18.15	17.093	-12.92	7.74949	17
19	5.44	18.10	8.19	17.36	8.02	16.03	9.51	21.55	14.03	6.53	12.19	4.21	8.52	18.19	8.13	16.54	4.06	13.50		
	20.089	-20.32	21.101	-15.23	20.188	-21.07	0.032	-0.18	6.600	23.23	4.462	19.99	21.731	-14.38	20.702	-18.13	17.098	-12.92	7.88090	19
21	5.43	18.13	8.06	17.27	8.01	16.10	9.45	21.55	13.54	6.44	12.11	4.13	8.44	18.11	8.06	16.46	3.58	13.42		
	20.230	-19.89	21.048	-14.83	20.364	-20.56	0.120	0.43	6.583	23.25	4.458	19.99	21.738	-14.34	20.707	-18.11	17.102	-12.92	8.01232	21
23	5.41	18.16	7.51	17.14	8.00	16.16	9.39	21.56	13.45	6.35	12.03	4.05	8.36	18.04	7.58	16.39	3.51	13.35		
	20.371	-19.43	20.946	-14.66	20.538	-20.01	0.208	1.04	6.567	23.27	4.453	19.98	21.745	-14.31	20.712	-18.09	17.106	-12.93	8.14374	23
25	5.39	18.19	7.35	16.58	7.59	16.22	9.34	21.57	13.36	6.27	11.54	3.57	8.29	17.57	7.50	16.32	3.43	13.27		
	20.510	-18.94	20.805	-14.73	20.711	-19.43	0.297	1.65	6.551	23.28	4.449	19.98	21.752	-14.27	20.717	-18.08	17.109	-12.93	8.27517	25
27	5.37	18.22	7.19	16.38	7.57	16.29	9.28	21.57	13.27	6.18	11.46	3.49	8.21	17.50	7.43	16.24	3.35	13.19		
	20.649	-18.44	20.639	-15.00	20.883	-18.80	0.385	2.25	6.536	23.30	4.446	19.98	21.759	-14.23	20.723	-18.06	17.113	-12.93	8.40659	27
29	5.34	18.25	7.03	16.17	7.55	16.36	9.22	21.58	13.18	6.10	11.38	3.41	8.13	17.43	7.35	16.17	3.28	13.12		
	20.786	-17.91	20.468	-15.42	21.053	-18.14	0.473	2.86	6.522	23.31	4.443	19.99	21.767	-14.19	20.728	-18.04	17.117	-12.93	8.53801	29
31	5.32	18.28	6.49	15.57	7.53	16.42	9.16	21.59	13.09	6.01	11.30	3.33	8.06	17.35	7.27	16.09	3.20	13.04		
	20.923	-17.36	20.310	-15.93	21.222	-17.45	0.561	3.46	6.508	23.33	4.441	19.99	21.774	-14.16	20.733	-18.02	17.120	-12.92	8.66943	31

LUTY 2002

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]									
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2452																			
32	1	Pią	307	21.00101	-13.31	20.5928	-17.05	0.98539	12.1313	4.08	56.983	3.5	83	730	1159.3	1629	2124	254.0	932	846	1	
33	2	Sob	308	21.04067	-13.39	21.0332	-16.48	0.98554	13.0620	-1.50	57.551	4.5	73	728	1159.4	1631	2249	345.5	950	842	2	
34	3	Nie	309	21.08032	-13.45	21.0736	-16.30	0.98569	13.5833	-7.34	58.238	5.5	62	727	1159.5	1633	****	435.7	1007	838	3	
35	4	Pon	310	21.11598	-13.51	21.1138	-16.12	0.98585	14.5044	-12.47	58.983	6.5	51	725	1159.6	1635	012	525.5	1026	834	4	
36	5	Wto	311	21.15563	-13.57	21.1540	-15.54	0.98601	15.4333	-17.14	59.734	0.9	40	723	1159.7	1637	133	615.9	1048	830	5	
37	6	Śro	312	21.19529	-14.01	21.1941	-15.36	0.98618	16.3722	-20.43	60.453	1.9	30	721	1159.8	1639	252	707.3	1115	826	6	
38	7	Czw	313	21.23495	-14.05	21.2341	-15.17	0.98635	17.3205	-23.04	61.118	2.9	21	719	1159.8	1641	406	759.8	1149	823	7	
39	8	Pią	314	21.27460	-14.07	21.2740	-14.58	0.98652	18.2711	-24.12	61.714	3.9	14	718	1159.9	1643	511	852.8	1232	819	8	
40	9	Sob	315	21.31426	-14.09	21.3139	-14.39	0.98670	19.2150	-24.06	62.239	4.9	8	716	1159.9	1645	606	945.5	1326	815	9	
41	10	Nie	316	21.35391	-14.11	21.3537	-14.20	0.98688	20.1509	-22.49	62.691	5.9	3	714	1159.9	1647	649	1036.7	1429	811	10	
42	11	Pon	317	21.39357	-14.11	21.3934	-14.00	0.98707	21.0629	-20.29	63.069	6.9	1	712	1159.9	1649	722	1125.8	1537	807	11	
43	12	Wto	318	21.43323	-14.11	21.4330	-13.40	0.98725	21.5529	-17.17	63.369	0.1	0	710	1159.9	1651	747	1212.4	1647	803	12	
44	13	Śro	319	21.47288	-14.10	21.4726	-13.20	0.98744	22.4216	-13.23	63.583	1.1	1	708	1159.9	1653	807	1256.4	1757	759	13	
45	14	Czw	320	21.51254	-14.08	21.5121	-12.60	0.98763	23.2711	-9.00	63.698	2.1	4	706	1159.9	1655	823	1338.5	1906	755	14	
46	15	Pią	321	21.55219	-14.06	21.5515	-12.39	0.98782	0.1050	-4.18	63.694	3.1	9	704	1159.8	1657	837	1419.3	2014	751	15	
47	16	Sob	322	21.59184	-14.02	21.5908	-12.19	0.98802	0.5357	0.33	63.553	4.1	15	702	1159.8	1659	851	1459.5	2123	747	16	
48	17	Nie	323	22.03150	-13.58	22.0301	-11.58	0.98822	1.3719	5.25	63.258	5.1	22	700	1159.7	1700	904	1540.2	2232	743	17	
49	18	Pon	324	22.07115	-13.54	22.0652	-11.36	0.98842	2.2150	10.08	62.797	6.1	30	658	1159.6	1702	919	1622.2	2342	739	18	
50	19	Wto	325	22.11081	-13.48	22.1044	-11.15	0.98862	3.0821	14.32	62.170	7.1	40	656	1159.6	1704	935	1706.6	****	735	19	
51	20	Śro	326	22.15047	-13.42	22.1434	-10.54	0.98883	3.5742	18.25	61.390	8.1	50	653	1159.5	1706	956	1754.3	055	731	20	
52	21	Czw	327	22.19012	-13.36	22.1824	-10.32	0.98904	4.5032	21.32	60.485	1.0	60	651	1159.3	1708	1024	1846.0	209	727	21	
53	22	Pią	328	22.22578	-13.28	22.2213	-10.10	0.98926	5.4705	23.38	59.502	2.0	70	649	1159.2	1710	1101	1941.7	321	724	22	
54	23	Sob	329	22.26543	-13.20	22.2602	-9.48	0.98948	6.4656	24.25	58.507	3.0	79	647	1159.1	1712	1152	2040.9	429	720	23	
55	24	Nie	330	22.30509	-13.11	22.2949	-9.26	0.98970	7.4856	23.41	57.578	4.0	88	645	1158.9	1714	1300	2141.8	526	716	24	
56	25	Pon	331	22.34475	-13.02	22.3337	-9.04	0.98993	8.5128	21.20	56.798	5.0	94	643	1158.8	1716	1421	2242.6	612	712	25	
57	26	Wto	332	22.38440	-12.52	22.3723	-8.42	0.99016	9.5258	17.29	56.246	6.0	99	640	1158.6	1718	1550	2341.6	646	708	26	
58	27	Śro	333	22.42406	-12.42	22.4110	-8.19	0.99039	10.5228	12.26	55.978	0.1	100	638	1158.4	1720	1722	*****	712	704	27	
59	28	Czw	334	22.46371	-12.31	22.4455	-7.57	0.99063	11.4945	6.34	56.020	1.1	98	636	1158.3	1722	1853	038.2	734	700	28	

Fazy Księżyca [Dm, h.mm]: 3kw 4, 14.33 Now 12, 8.41 1kw 20, 13.02 Pełn 27, 10.17

LUTY 2002 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST		Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0 ^h UT)		
1	5.30	18.30	6.42	15.47	7.52	16.46	9.13	21.59	13.05	5.57	11.26	3.29	8.02	17.32	7.23	16.06	3.16	13.00			
	20.991	-17.08	20.240	-16.20	21.306	-17.09	0.605	3.76	6.502	23.33	4.440	19.99	21.778	-14.14	20.735	-18.01	17.122	-12.92	8.73514	1	
3	5.28	18.33	6.31	15.29	7.49	16.52	9.07	21.59	12.56	5.48	11.18	3.21	7.54	17.25	7.16	15.58	3.09	12.53			
	21.127	-16.50	20.127	-16.73	21.473	-16.34	0.693	4.35	6.489	23.35	4.438	20.00	21.785	-14.10	20.741	-17.99	17.125	-12.92	8.86655	3	
5	5.25	18.36	6.22	15.14	7.46	16.59	9.02	22.00	12.48	5.40	11.10	3.13	7.47	17.17	7.08	15.51	3.01	12.45			
	21.261	-15.90	20.053	-17.23	21.638	-15.57	0.781	4.95	6.478	23.36	4.437	20.00	21.793	-14.06	20.746	-17.97	17.129	-12.92	8.99797	5	
7	5.22	18.40	6.15	15.01	7.44	17.06	8.56	22.01	12.39	5.31	11.02	3.05	7.39	17.10	7.00	15.43	2.53	12.37			
	21.395	-15.29	20.017	-17.68	21.802	-14.76	0.869	5.53	6.467	23.37	4.437	20.01	21.800	-14.02	20.751	-17.95	17.132	-12.92	9.12939	7	
9	5.19	18.43	6.09	14.51	7.40	17.13	8.50	22.01	12.30	5.23	10.54	2.57	7.31	17.03	6.53	15.36	2.45	12.30			
	21.528	-14.65	20.018	-18.07	21.965	-13.93	0.957	6.12	6.457	23.38	4.437	20.02	21.808	-13.98	20.756	-17.93	17.135	-12.91	9.26082	9	
11	5.15	18.47	6.06	14.43	7.37	17.20	8.44	22.02	12.22	5.15	10.47	2.49	7.24	16.56	6.45	15.28	2.38	12.22			
	21.659	-14.00	20.051	-18.37	22.127	-13.08	1.046	6.70	6.448	23.39	4.437	20.03	21.815	-13.95	20.761	-17.91	17.137	-12.91	9.39224	11	
13	5.12	18.50	6.03	14.37	7.34	17.26	8.39	22.02	12.14	5.06	10.39	2.42	7.16	16.49	6.37	15.21	2.30	12.14			
	21.790	-13.33	20.112	-18.60	22.287	-12.20	1.134	7.28	6.440	23.40	4.438	20.04	21.822	-13.91	20.766	-17.89	17.140	-12.91	9.52366	13	
15	5.08	18.54	6.01	14.34	7.30	17.33	8.33	22.03	12.05	4.58	10.31	2.34	7.08	16.41	6.30	15.14	2.22	12.07			
	21.921	-12.65	20.197	-18.74	22.446	-11.30	1.223	7.85	6.433	23.41	4.440	20.05	21.830	-13.87	20.771	-17.87	17.143	-12.90	9.65507	15	
17	5.04	18.57	5.60	14.32	7.27	17.40	8.27	22.04	11.57	4.50	10.23	2.26	7.01	16.34	6.22	15.06	2.15	11.59			
	22.050	-11.96	20.302	-18.80	22.604	-10.38	1.312	8.41	6.426	23.42	4.442	20.07	21.837	-13.83	20.776	-17.85	17.145	-12.90	9.78649	17	
19	5.00	19.01	5.59	14.31	7.23	17.47	8.22	22.04	11.49	4.42	10.15	2.19	6.53	16.27	6.14	14.59	2.07	11.51			
	22.179	-11.25	20.424	-18.77	22.761	-9.44	1.400	8.97	6.421	23.42	4.445	20.08	21.845	-13.79	20.781	-17.83	17.147	-12.90	9.91791	19	
21	4.56	19.04	5.58	14.32	7.19	17.54	8.16	22.05	11.40	4.34	10.07	2.11	6.45	16.20	6.07	14.51	1.59	11.44			
	22.307	-10.53	20.560	-18.65	22.917	-8.49	1.489	9.52	6.417	23.43	4.448	20.10	21.852	-13.75	20.786	-17.82	17.150	-12.89	10.04933	21	
23	4.52	19.08	5.58	14.35	7.15	18.00	8.10	22.05	11.32	4.26	9.60	2.04	6.38	16.13	5.59	14.44	1.51	11.36			
	22.434	-9.81	20.707	-18.44	23.072	-7.52	1.579	10.07	6.413	23.44	4.452	20.11	21.860	-13.71	20.790	-17.80	17.152	-12.89	10.18075	23	
25	4.48	19.12	5.58	14.38	7.11	18.07	8.05	22.06	11.24	4.18	9.52	1.56	6.30	16.06	5.51	14.36	1.43	11.28			
	22.560	-9.07	20.864	-18.14	23.226	-6.53	1.668	10.61	6.411	23.44	4.456	20.13	21.867	-13.68	20.795	-17.78	17.153	-12.88	10.31217	25	
27	4.44	19.16	5.57	14.43	7.07	18.14	7.59	22.06	11.16	4.10	9.44	1.49	6.23	15.58	5.43	14.29	1.36	11.20			
	22.686	-8.32	21.030	-17.76	23.380	-5.54	1.757	11.15	6.409	23.45	4.460	20.15	21.875	-13.64	20.800	-17.76	17.155	-12.87	10.44359	27	

MARZEC 2002

Piwnice, CA UMK				← Dane na godz. 12 czasu strefowego (= 11 lub 10 ^h UT) →										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2452																					
60	1	Pią	335	22.50337	-12.19	22.4840	-7.34	0.99088	12.4514	0.22	56.362	2.1	93	634	1158.1	1723	2023	132.4	752	656	1
61	2	Sob	336	22.54302	-12.07	22.5225	-7.11	0.99112	13.3938	-5.46	56.959	3.1	86	631	1157.9	1725	2151	225.1	810	652	2
62	3	Nie	337	22.58267	-11.55	22.5609	-6.48	0.99138	14.3343	-11.25	57.745	4.1	77	629	1157.7	1727	2316	317.1	829	648	3
63	4	Pon	338	23.02233	-11.42	22.5953	-6.25	0.99163	15.2806	-16.18	58.642	5.1	67	627	1157.4	1729	****	409.2	850	644	4
64	5	Wto	339	23.06199	-11.29	23.0336	-6.02	0.99189	16.2306	-20.10	59.573	6.1	56	624	1157.2	1731	039	501.9	915	640	5
65	6	Śro	340	23.10164	-11.15	23.0719	-5.39	0.99215	17.1840	-22.51	60.474	0.4	46	622	1157.0	1733	157	555.3	948	636	6
66	7	Czw	341	23.14130	-11.01	23.1101	-5.15	0.99241	18.1419	-24.16	61.299	1.4	36	620	1156.8	1735	307	649.0	1029	632	7
67	8	Pią	342	23.18095	-10.46	23.1443	-4.52	0.99268	19.0918	-24.25	62.015	2.4	26	617	1156.5	1737	405	742.1	1120	628	8
68	9	Sob	343	23.22061	-10.31	23.1825	-4.28	0.99294	20.0251	-23.22	62.607	3.4	18	615	1156.3	1738	451	833.8	1220	625	9
69	10	Nie	344	23.26027	-10.16	23.2206	-4.05	0.99321	20.5422	-21.15	63.071	4.4	11	613	1156.0	1740	526	923.3	1327	621	10
70	11	Pon	345	23.29592	-10.01	23.2547	-3.41	0.99348	21.4335	-18.12	63.411	5.4	6	610	1155.8	1742	553	1010.3	1436	617	11
71	12	Wto	346	23.33558	-9.45	23.2928	-3.18	0.99375	22.3036	-14.27	63.634	6.4	2	608	1155.5	1744	613	1054.8	1546	613	12
72	13	Śro	347	23.37523	-9.29	23.3308	-2.54	0.99402	23.1545	-10.08	63.747	7.4	0	606	1155.2	1746	630	1137.2	1656	609	13
73	14	Czw	348	23.41488	-9.12	23.3648	-2.30	0.99429	23.5936	-5.27	63.757	0.4	0	603	1155.0	1748	645	1218.4	1805	605	14
74	15	Pią	349	23.45454	-8.56	23.4028	-2.07	0.99456	0.4247	-0.34	63.663	1.4	2	601	1154.7	1749	658	1258.6	1913	601	15
75	16	Sob	350	23.49419	-8.39	23.4408	-1.43	0.99483	1.2603	4.21	63.462	2.4	5	559	1154.4	1751	711	1339.1	2022	557	16
76	17	Nie	351	23.53385	-8.22	23.4747	-1.19	0.99510	2.1009	9.10	63.146	3.4	10	556	1154.1	1753	725	1420.5	2132	553	17
77	18	Pon	352	23.57350	-8.04	23.5127	-0.56	0.99537	2.5552	13.40	62.709	4.4	16	554	1153.8	1755	740	1503.8	2244	549	18
78	19	Wto	353	0.01316	-7.47	23.5506	-0.32	0.99565	3.4355	17.41	62.146	5.4	24	551	1153.5	1757	759	1549.7	2357	545	19
79	20	Śro	354	0.05282	-7.29	23.5844	-0.08	0.99592	4.3454	21.00	61.458	6.4	33	549	1153.2	1759	823	1638.9	****	541	20
80	21	Czw	355	0.09247	-7.11	0.0223	0.16	0.99619	5.2904	23.23	60.659	7.4	43	547	1152.9	1800	855	1731.7	109	537	21
81	22	Pią	356	0.13213	-6.53	0.0602	0.39	0.99647	6.2616	24.34	59.775	0.4	54	544	1152.6	1802	939	1827.7	217	533	22
82	23	Sob	357	0.17178	-6.35	0.0940	1.03	0.99674	7.2542	24.23	58.850	1.4	64	542	1152.3	1804	1038	1925.9	317	530	23
83	24	Nie	358	0.21144	-6.17	0.1319	1.27	0.99702	8.2612	22.41	57.945	2.4	75	539	1152.0	1806	1151	2024.8	406	526	24
84	25	Pon	359	0.25109	-5.59	0.1657	1.50	0.99730	9.2628	19.29	57.133	3.4	84	537	1151.7	1808	1314	2123.0	443	522	25
85	26	Wto	360	0.29075	-5.41	0.2035	2.14	0.99758	10.2534	14.58	56.490	4.4	92	535	1151.4	1809	1444	2219.7	512	518	26
86	27	Śro	361	0.33040	-5.22	0.2414	2.37	0.99786	11.2308	9.25	56.089	5.4	97	532	1151.1	1811	1615	2314.7	534	514	27
87	28	Czw	362	0.37006	-5.04	0.2752	3.01	0.99815	12.1921	3.15	55.977	6.4	100	530	1150.8	1813	1747	****	554	510	28
88	29	Pią	363	0.40571	-4.46	0.3130	3.24	0.99843	13.1447	-3.07	56.175	0.7	99	527	1150.5	1815	1917	008.5	612	506	29
89	30	Sob	364	0.44537	-4.28	0.3509	3.47	0.99872	14.1010	-9.13	56.662	1.7	96	525	1150.2	1817	2047	101.8	630	502	30
90	31	Nie	365	0.48502	-4.10	0.3847	4.11	0.99901	15.0604	-14.40	57.391	2.7	90	523	1149.9	1818	2215	155.3	650	458	31
90	31	Nie	365	23.48404	-4.10	0.3838	4.10	0.99900	15.0343	-14.27	57.357	3.7	90	623	1249.9	1918	2315	255.3	750	558	31

Fazy Księżyca [Dm, h.mm]: 3kw 6, 2.25 Now 14, 3.02 1kw 22, 3.28 Pełn 28, 19.25

MARZEC 2002 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.39	19.19	5.57	14.48	7.03	18.20	7.54	22.07	11.08	4.02	9.36	1.41	6.15	15.51	5.36	14.21	1.28	11.13		
	22.811	-7.56	21.202	-17.28	23.532	-4.53	1.847	11.67	6.409	23.45	4.466	20.17	21.882	-13.60	20.804	-17.74	17.157	-12.87	10.57500	1
3	4.35	19.23	5.56	14.54	6.59	18.27	7.48	22.08	11.01	3.54	9.29	1.34	6.07	15.44	5.28	14.14	1.20	11.05		
	22.936	-6.80	21.380	-16.72	23.685	-3.52	1.937	12.19	6.409	23.45	4.471	20.19	21.889	-13.56	20.809	-17.73	17.158	-12.86	10.70642	3
5	4.30	19.27	5.55	15.01	6.55	18.34	7.43	22.08	10.53	3.46	9.21	1.27	5.60	15.37	5.20	14.06	1.12	10.57		
	23.060	-6.03	21.563	-16.08	23.836	-2.50	2.027	12.70	6.410	23.45	4.478	20.21	21.896	-13.52	20.813	-17.71	17.159	-12.86	10.83784	5
7	4.25	19.31	5.54	15.09	6.51	18.40	7.37	22.09	10.45	3.39	9.14	1.19	5.52	15.29	5.13	13.59	1.04	10.49		
	23.184	-5.25	21.751	-15.34	23.988	-1.48	2.117	13.21	6.413	23.46	4.484	20.24	21.903	-13.49	20.818	-17.69	17.160	-12.85	10.96926	7
9	4.20	19.35	5.53	15.18	6.46	18.47	7.32	22.09	10.37	3.31	9.06	1.12	5.44	15.22	5.05	13.51	0.57	10.42		
	23.307	-4.47	21.942	-14.52	0.139	-0.45	2.208	13.70	6.416	23.46	4.491	20.26	21.911	-13.45	20.822	-17.68	17.161	-12.84	11.10068	9
11	4.15	19.39	5.51	15.27	6.42	18.54	7.26	22.10	10.30	3.23	8.58	1.05	5.37	15.15	4.57	13.44	0.49	10.34		
	23.430	-3.69	22.137	-13.62	0.290	0.58	2.298	14.19	6.420	23.46	4.499	20.29	21.918	-13.41	20.826	-17.66	17.162	-12.84	11.23210	11
13	4.10	19.43	5.49	15.37	6.38	19.00	7.21	22.10	10.22	3.16	8.51	0.58	5.29	15.08	4.49	13.36	0.41	10.26		
	23.552	-2.90	22.335	-12.64	0.441	1.60	2.389	14.67	6.425	23.46	4.507	20.31	21.924	-13.38	20.830	-17.64	17.163	-12.83	11.36352	13
15	4.05	19.47	5.47	15.47	6.33	19.07	7.16	22.11	10.15	3.08	8.43	0.50	5.21	15.01	4.42	13.29	0.33	10.18		
	23.674	-2.11	22.536	-11.57	0.592	2.63	2.481	15.14	6.431	23.46	4.516	20.34	21.931	-13.34	20.834	-17.63	17.163	-12.82	11.49493	15
17	3.60	19.51	5.45	15.58	6.29	19.14	7.10	22.11	10.07	3.01	8.36	0.43	5.14	14.53	4.34	13.21	0.25	10.11		
	23.796	-1.32	22.740	-10.41	0.743	3.65	2.572	15.60	6.438	23.46	4.525	20.36	21.938	-13.31	20.838	-17.61	17.164	-12.81	11.62635	17
19	3.54	19.55	5.43	16.09	6.25	19.20	7.05	22.11	9.60	2.53	8.28	0.36	5.06	14.46	4.26	13.14	0.17	10.03		
	23.918	-0.53	22.948	-9.18	0.894	4.67	2.664	16.05	6.446	23.45	4.534	20.39	21.945	-13.27	20.842	-17.60	17.164	-12.80	11.75777	19
21	3.49	19.60	5.40	16.21	6.20	19.27	7.00	22.12	9.53	2.46	8.21	0.29	4.58	14.39	4.19	13.06	0.09	9.55		
	0.040	0.26	23.158	-7.87	1.046	5.68	2.756	16.49	6.455	23.45	4.544	20.42	21.951	-13.24	20.845	-17.58	17.164	-12.80	11.88919	21
23	3.43	20.04	5.38	16.34	6.16	19.34	6.55	22.12	9.45	2.39	8.13	0.22	4.51	14.31	4.11	12.59	23.57	9.47		
	0.161	1.05	23.371	-6.48	1.198	6.69	2.848	16.92	6.465	23.45	4.554	20.45	21.958	-13.21	20.849	-17.57	17.164	-12.79	12.02061	23
25	3.38	20.09	5.35	16.47	6.12	19.40	6.50	22.13	9.38	2.32	8.06	0.15	4.43	14.24	4.03	12.51	23.49	9.39		
	0.283	1.84	23.588	-5.02	1.350	7.68	2.941	17.34	6.475	23.44	4.565	20.48	21.964	-13.17	20.852	-17.56	17.164	-12.78	12.15203	25
27	3.32	20.13	5.32	17.00	6.08	19.47	6.45	22.13	9.31	2.24	7.58	0.08	4.35	14.17	3.55	12.43	23.42	9.31		
	0.404	2.62	23.809	-3.48	1.503	8.66	3.033	17.75	6.486	23.44	4.576	20.51	21.970	-13.14	20.856	-17.54	17.163	-12.77	12.28344	27
29	3.26	20.18	5.29	17.14	6.04	19.54	6.40	22.13	9.24	2.17	7.51	23.57	4.28	14.10	3.48	12.36	23.34	9.24		
	0.525	3.40	0.034	-1.88	1.656	9.63	3.126	18.15	6.498	23.43	4.588	20.54	21.976	-13.11	20.859	-17.53	17.163	-12.76	12.41486	29
31	3.20	20.23	5.26	17.29	5.60	20.01	6.35	22.14	9.17	2.10	7.44	23.50	4.20	14.02	3.40	12.28	23.26	9.16		
	0.646	4.18	0.263	-0.20	1.811	10.59	3.219	18.54	6.511	23.43	4.599	20.57	21.982	-13.08	20.862	-17.52	17.162	-12.76	12.54628	31
31	4.20	21.23	6.26	18.29	6.60	21.00	7.35	23.14	10.17	3.10	8.44	0.54	5.20	15.02	4.40	13.28	0.30	10.16		
	0.644	4.16	0.258	-0.24	1.807	10.57	3.217	18.53	6.511	23.43	4.599	20.57	21.982	-13.08	20.862	-17.52	17.162	-12.76	12.54628	31

KWIECIEŃ 2002

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]									
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2452																			
91	1	Pon	366	23.52369	-3.52	0.4217	4.33	0.99929	16.0024	-18.58	58.247	4.7	82	620	1249.6	1920	****	349.8	814	554	1	
92	2	Wto	367	23.56335	-3.35	0.4555	4.56	0.99958	16.5747	-22.15	59.227	5.7	73	618	1249.3	1922	039	445.1	843	550	2	
93	3	Śro	368	24.00300	-3.17	0.4934	5.19	0.99987	17.5515	-24.12	60.216	6.7	63	615	1249.0	1924	155	540.7	922	546	3	
94	4	Czw	369	0.04266	-2.59	0.5313	5.42	1.00017	18.5157	-24.46	61.145	7.7	52	613	1248.7	1926	300	635.8	1011	542	4	
95	5	Pią	370	0.08232	-2.42	0.5652	6.05	1.00046	19.4659	-24.03	61.963	0.8	42	611	1248.4	1927	351	729.2	1110	538	5	
96	6	Sob	371	0.12197	-2.25	1.0032	6.27	1.00075	20.3939	-22.11	62.636	1.8	33	608	1248.2	1929	430	820.1	1216	534	6	
97	7	Nie	372	0.16163	-2.08	1.0411	6.50	1.00105	21.2943	-19.21	63.145	2.8	24	606	1247.9	1931	459	908.1	1325	531	7	
98	8	Pon	373	0.20128	-1.51	1.0751	7.13	1.00134	22.1717	-15.45	63.489	3.8	16	604	1247.6	1933	521	953.3	1435	527	8	
99	9	Wto	374	0.24094	-1.35	1.1131	7.35	1.00163	23.0247	-11.33	63.674	4.8	10	601	1247.3	1935	538	1036.3	1545	523	9	
100	10	Śro	375	0.28059	-1.18	1.1512	7.57	1.00192	23.4649	-6.55	63.716	5.8	5	559	1247.1	1936	553	1117.6	1654	519	10	
101	11	Czw	376	0.32025	-1.02	1.1852	8.19	1.00220	0.3004	-2.02	63.633	6.8	2	557	1246.8	1938	606	1158.0	1803	515	11	
102	12	Pią	377	0.35590	-0.47	1.2233	8.41	1.00249	1.1317	2.57	63.442	7.8	0	554	1246.5	1940	619	1238.4	1912	511	12	
103	13	Sob	378	0.39556	-0.31	1.2614	9.03	1.00277	1.5713	7.53	63.158	0.6	0	552	1246.3	1942	632	1319.5	2023	507	13	
104	14	Nie	379	0.43521	-0.16	1.2956	9.25	1.00305	2.4238	12.34	62.790	1.6	2	550	1246.0	1943	647	1402.4	2135	503	14	
105	15	Pon	380	0.47487	-0.02	1.3338	9.46	1.00333	3.3011	16.48	62.346	2.6	6	547	1245.8	1945	705	1447.6	2248	459	15	
106	16	Wto	381	0.51452	0.13	1.3720	10.08	1.00360	4.2025	20.22	61.828	3.6	12	545	1245.5	1947	726	1535.9	****	455	16	
107	17	Śro	382	0.55418	0.27	1.4102	10.29	1.00387	5.1333	23.03	61.236	4.6	19	543	1245.3	1949	755	1627.3	001	451	17	
108	18	Czw	383	0.59383	0.40	1.4445	10.50	1.00415	6.0924	24.36	60.577	5.6	28	541	1245.1	1951	834	1721.7	111	447	18	
109	19	Pią	384	1.03349	0.53	1.4829	11.11	1.00442	7.0715	24.50	59.863	6.6	38	538	1244.9	1952	927	1818.1	213	443	19	
110	20	Sob	385	1.07315	1.06	1.5212	11.31	1.00468	8.0603	23.39	59.114	7.6	49	536	1244.6	1954	1033	1915.1	304	439	20	
111	21	Nie	386	1.11280	1.19	1.5557	11.52	1.00495	9.0440	21.02	58.367	0.9	60	534	1244.4	1956	1151	2011.7	344	435	21	
112	22	Pon	387	1.15246	1.31	1.5941	12.12	1.00522	10.0214	17.06	57.670	1.9	71	532	1244.2	1958	1316	2106.9	414	432	22	
113	23	Wto	388	1.19211	1.42	2.0326	12.32	1.00548	10.5827	12.05	57.081	2.9	81	530	1244.0	2000	1443	2200.5	438	428	23	
114	24	Śro	389	1.23177	1.53	2.0711	12.52	1.00575	11.5331	6.15	56.662	3.9	89	528	1243.9	2001	1612	2253.2	457	424	24	
115	25	Czw	390	1.27142	2.04	2.1057	13.12	1.00601	12.4801	0.01	56.466	4.9	96	525	1243.7	2003	1742	2345.6	515	420	25	
116	26	Pią	391	1.31108	2.14	2.1444	13.31	1.00627	13.4242	-6.16	56.529	5.9	99	523	1243.5	2005	1912	*****	532	416	26	
117	27	Sob	392	1.35073	2.24	2.1831	13.50	1.00653	14.3818	-12.09	56.859	0.3	100	521	1243.3	2007	2041	038.6	550	412	27	
118	28	Nie	393	1.39039	2.33	2.2218	14.09	1.00680	15.3517	-17.14	57.435	1.3	98	519	1243.2	2008	2210	133.0	612	408	28	
119	29	Pon	394	1.43004	2.42	2.2606	14.28	1.00706	16.3338	-21.11	58.207	2.3	93	517	1243.0	2010	2333	228.9	638	404	29	
120	30	Wto	395	1.46570	2.50	2.2954	14.47	1.00732	17.3246	-23.47	59.107	3.3	86	515	1242.9	2012	****	326.1	713	400	30	

Fazy Księżyca [Dm, h.mm]: 3kw 4, 17.29 Now 12, 21.21 1kw 20, 14.48 Pełn 27, 5.00

KWIECIEŃ 2002 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.17	21.25	6.24	18.36	6.58	21.04	7.33	23.14	10.13	3.06	8.40	0.51	5.16	14.59	4.36	13.24	0.26	10.12		
	0.705	4.55	0.374	0.62	1.885	11.04	3.264	18.72	6.518	23.42	4.605	20.59	21.985	-13.06	20.863	-17.51	17.162	-12.75	12.61198	1
3	4.11	21.30	6.21	18.52	6.54	21.11	7.28	23.14	10.06	2.59	8.33	0.44	5.08	14.51	4.28	13.17	0.18	10.04		
	0.826	5.32	0.610	2.38	2.040	11.97	3.358	19.10	6.532	23.42	4.618	20.62	21.991	-13.03	20.866	-17.50	17.161	-12.74	12.74341	3
5	4.05	21.35	6.18	19.08	6.50	21.17	7.23	23.14	9.59	2.52	8.25	0.37	5.01	14.44	4.20	13.09	0.10	9.56		
	0.948	6.08	0.851	4.18	2.196	12.88	3.452	19.46	6.546	23.41	4.630	20.65	21.996	-13.00	20.869	-17.49	17.160	-12.73	12.87483	5
7	3.59	21.40	6.15	19.25	6.46	21.24	7.18	23.14	9.52	2.45	8.18	0.30	4.53	14.36	4.13	13.02	0.02	9.48		
	1.070	6.83	1.097	6.02	2.354	13.77	3.546	19.81	6.562	23.40	4.643	20.68	22.002	-12.98	20.872	-17.48	17.159	-12.73	13.00625	7
9	3.52	21.46	6.12	19.42	6.42	21.31	7.14	23.14	9.46	2.38	8.11	0.23	4.45	14.29	4.05	12.54	23.50	9.40		
	1.192	7.58	1.347	7.88	2.512	14.63	3.640	20.15	6.578	23.39	4.657	20.71	22.007	-12.95	20.874	-17.47	17.157	-12.72	13.13766	9
11	3.46	21.51	6.09	19.60	6.39	21.38	7.09	23.15	9.39	2.31	8.03	0.16	4.38	14.22	3.57	12.46	23.42	9.32		
	1.314	8.32	1.601	9.74	2.671	15.48	3.735	20.47	6.595	23.37	4.670	20.75	22.012	-12.92	20.877	-17.46	17.156	-12.71	13.26908	11
13	3.39	21.57	6.06	20.18	6.35	21.45	7.05	23.15	9.32	2.24	7.56	0.10	4.30	14.14	3.49	12.39	23.34	9.24		
	1.437	9.05	1.858	11.57	2.832	16.29	3.829	20.79	6.613	23.36	4.684	20.78	22.017	-12.90	20.879	-17.45	17.154	-12.70	13.40050	13
15	3.32	22.03	6.03	20.36	6.32	21.52	7.01	23.15	9.26	2.18	7.49	0.03	4.22	14.07	3.42	12.31	23.26	9.17		
	1.560	9.77	2.116	13.35	2.993	17.08	3.924	21.09	6.631	23.35	4.699	20.81	22.022	-12.87	20.881	-17.44	17.153	-12.69	13.53191	15
17	3.26	22.08	5.60	20.54	6.29	21.58	6.56	23.15	9.19	2.11	7.42	23.52	4.14	13.59	3.34	12.23	23.18	9.09		
	1.684	10.48	2.372	15.05	3.156	17.85	4.020	21.38	6.650	23.33	4.713	20.85	22.027	-12.85	20.883	-17.44	17.151	-12.68	13.66334	17
19	3.19	22.15	5.57	21.11	6.26	22.05	6.52	23.14	9.12	2.04	7.35	23.46	4.07	13.52	3.26	12.15	23.10	9.01		
	1.808	11.18	2.624	16.64	3.320	18.58	4.115	21.65	6.669	23.32	4.728	20.88	22.031	-12.82	20.885	-17.43	17.149	-12.67	13.79476	19
21	3.12	22.21	5.55	21.27	6.24	22.12	6.48	23.14	9.06	1.57	7.27	23.39	3.59	13.44	3.18	12.08	23.02	8.53		
	1.932	11.87	2.870	18.10	3.485	19.28	4.211	21.92	6.689	23.30	4.744	20.91	22.036	-12.80	20.886	-17.42	17.147	-12.67	13.92618	21
23	3.04	22.28	5.52	21.42	6.21	22.19	6.44	23.14	8.59	1.50	7.20	23.32	3.51	13.37	3.10	11.60	22.54	8.45		
	2.057	12.54	3.107	19.40	3.652	19.94	4.306	22.17	6.710	23.28	4.759	20.95	22.040	-12.78	20.888	-17.42	17.144	-12.66	14.05759	23
25	2.57	22.35	5.50	21.56	6.19	22.25	6.40	23.14	8.53	1.44	7.13	23.25	3.43	13.29	3.02	11.52	22.46	8.37		
	2.183	13.20	3.331	20.55	3.819	20.57	4.402	22.41	6.731	23.26	4.775	20.98	22.044	-12.76	20.889	-17.41	17.142	-12.65	14.18901	25
27	2.49	22.42	5.47	22.08	6.17	22.32	6.36	23.13	8.47	1.37	7.06	23.19	3.36	13.22	2.55	11.44	22.37	8.29		
	2.308	13.84	3.541	21.53	3.988	21.16	4.499	22.64	6.753	23.24	4.791	21.01	22.048	-12.74	20.891	-17.41	17.140	-12.64	14.32043	27
29	2.41	22.50	5.45	22.18	6.15	22.38	6.33	23.13	8.40	1.30	6.59	23.12	3.28	13.14	2.47	11.37	22.29	8.21		
	2.435	14.47	3.735	22.34	4.157	21.72	4.595	22.85	6.776	23.22	4.807	21.05	22.051	-12.72	20.892	-17.40	17.137	-12.64	14.45185	29

MAJ 2002

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2452																			
121	1	Śro	396	1.50536	2.58	2.3343	15.05	1.00758	18.3136	-24.55	60.058	4.3	78	513	1242.8	2014	046	423.4	758	356	1	
122	2	Czw	397	1.54501	3.05	2.3733	15.23	1.00783	19.2854	-24.38	60.986	5.3	68	511	1242.7	2016	146	519.5	855	352	2	
123	3	Pią	398	1.58467	3.11	2.4123	15.41	1.00809	20.2340	-23.05	61.826	6.3	59	509	1242.6	2017	230	612.9	1000	348	3	
124	4	Sob	399	2.02432	3.17	2.4513	15.58	1.00834	21.1525	-20.28	62.528	0.1	49	507	1242.5	2019	303	703.1	1110	344	4	
125	5	Nie	400	2.06398	3.23	2.4904	16.15	1.00860	22.0412	-17.01	63.059	1.1	39	505	1242.4	2021	327	750.0	1222	340	5	
126	6	Pon	401	2.10363	3.27	2.5256	16.32	1.00884	22.5028	-12.55	63.404	2.1	30	503	1242.3	2022	346	834.0	1332	337	6	
127	7	Wto	402	2.14329	3.32	2.5649	16.49	1.00909	23.3452	-8.22	63.561	3.1	22	501	1242.2	2024	402	915.8	1442	333	7	
128	8	Śro	403	2.18294	3.35	3.0042	17.06	1.00933	0.1812	-3.31	63.543	4.1	15	500	1242.2	2026	415	956.4	1551	329	8	
129	9	Czw	404	2.22260	3.38	3.0435	17.22	1.00957	1.0118	1.30	63.371	5.1	9	458	1242.1	2028	428	1036.6	1700	325	9	
130	10	Pią	405	2.26225	3.41	3.0829	17.38	1.00980	1.4460	6.30	63.073	6.1	4	456	1242.1	2029	440	1117.4	1810	321	10	
131	11	Sob	406	2.30191	3.43	3.1224	17.53	1.01003	2.3007	11.19	62.679	7.1	1	454	1242.0	2031	454	1159.8	1922	317	11	
132	12	Nie	407	2.34156	3.44	3.1619	18.08	1.01026	3.1724	15.46	62.217	8.1	0	453	1242.0	2033	511	1244.5	2036	313	12	
133	13	Pon	408	2.38122	3.45	3.2015	18.23	1.01048	4.0726	19.36	61.711	1.0	1	451	1242.0	2034	531	1332.3	2151	309	13	
134	14	Wto	409	2.42088	3.45	3.2411	18.38	1.01070	5.0027	22.35	61.180	2.0	4	449	1242.0	2036	557	1423.4	2303	305	14	
135	15	Śro	410	2.46053	3.44	3.2808	18.52	1.01091	5.5616	24.28	60.637	3.0	9	448	1242.0	2038	633	1517.5	****	301	15	
136	16	Czw	411	2.50019	3.43	3.3206	19.06	1.01112	6.5405	25.02	60.089	4.0	16	446	1242.0	2039	721	1613.7	009	257	16	
137	17	Pią	412	2.53585	3.42	3.3604	19.20	1.01132	7.5245	24.11	59.544	5.0	24	444	1242.0	2041	823	1710.6	104	253	17	
138	18	Sob	413	2.57550	3.40	3.4002	19.33	1.01152	8.5058	21.55	59.008	6.0	34	443	1242.1	2042	937	1806.7	147	249	18	
139	19	Nie	414	3.01516	3.37	3.4402	19.46	1.01172	9.4749	18.21	58.496	7.0	45	441	1242.1	2044	1059	1901.1	219	245	19	
140	20	Pon	415	3.05481	3.34	3.4801	19.59	1.01191	10.4258	13.42	58.030	0.6	57	440	1242.2	2045	1224	1953.7	244	241	20	
141	21	Wto	416	3.09447	3.30	3.5201	20.11	1.01210	11.3637	8.14	57.638	1.6	68	439	1242.2	2047	1350	2044.7	304	238	21	
142	22	Śro	417	3.13412	3.26	3.5602	20.23	1.01229	12.2926	2.16	57.359	2.6	78	437	1242.3	2048	1516	2135.2	321	234	22	
143	23	Czw	418	3.17378	3.22	4.0003	20.35	1.01248	13.2216	-3.53	57.229	3.6	87	436	1242.4	2050	1643	2226.2	337	230	23	
144	24	Pią	419	3.21343	3.17	4.0405	20.46	1.01266	14.1602	-9.50	57.282	4.6	94	435	1242.5	2051	1810	2318.5	354	226	24	
145	25	Sob	420	3.25309	3.11	4.0807	20.57	1.01284	15.1126	-15.14	57.534	5.6	98	433	1242.6	2053	1938	*****	413	222	25	
146	26	Nie	421	3.29274	3.05	4.1210	21.08	1.01301	16.0849	-19.42	57.984	6.6	100	432	1242.7	2054	2105	012.9	436	218	26	
147	27	Pon	422	3.33240	2.58	4.1613	21.18	1.01319	17.0753	-22.55	58.609	0.9	99	431	1242.8	2055	2224	109.4	506	214	27	
148	28	Wto	423	3.37206	2.51	4.2017	21.28	1.01336	18.0739	-24.42	59.364	1.9	95	430	1242.9	2057	2332	207.4	546	210	28	
149	29	Śro	424	3.41171	2.43	4.2421	21.37	1.01353	19.0644	-24.59	60.191	2.9	90	429	1243.0	2058	****	305.2	638	206	29	
150	30	Czw	425	3.45137	2.35	4.2825	21.46	1.01370	20.0343	-23.53	61.025	3.9	83	428	1243.2	2059	024	401.2	741	202	30	
151	31	Pią	426	3.49103	2.27	4.3231	21.55	1.01386	20.5740	-21.36	61.802	4.9	74	427	1243.3	2100	103	454.1	851	158	31	

Fazy Księżyca [Dm, h.mm]: 3kw 4, 9.16 Now 12, 12.45 1kw 19, 21.42 Pełn 26, 13.51

MAJ 2002 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	2.33	22.58	5.43	22.25	6.13	22.44	6.29	23.12	8.34	1.23	6.52	23.05	3.20	13.07	2.39	11.29	22.21	8.13		
	2.562	15.08	3.911	22.98	4.328	22.24	4.691	23.05	6.798	23.20	4.823	21.08	22.055	-12.70	20.893	-17.40	17.135	-12.63	14.58327	1
3	2.24	23.06	5.41	22.30	6.12	22.50	6.25	23.12	8.28	1.17	6.44	22.59	3.12	12.59	2.31	11.21	22.13	8.05		
	2.690	15.68	4.068	23.46	4.500	22.71	4.788	23.23	6.822	23.17	4.840	21.11	22.058	-12.69	20.894	-17.40	17.132	-12.62	14.71469	3
5	2.15	23.15	5.38	22.33	6.11	22.56	6.22	23.11	8.21	1.10	6.37	22.52	3.05	12.52	2.23	11.13	22.05	7.57		
	2.818	16.26	4.204	23.80	4.673	23.14	4.884	23.41	6.846	23.15	4.857	21.14	22.061	-12.67	20.894	-17.39	17.129	-12.61	14.84611	5
7	2.05	23.26	5.36	22.34	6.11	23.02	6.19	23.10	8.15	1.04	6.30	22.46	2.57	12.44	2.16	11.06	21.57	7.49		
	2.947	16.82	4.318	23.98	4.846	23.53	4.981	23.56	6.870	23.12	4.873	21.18	22.064	-12.66	20.895	-17.39	17.126	-12.61	14.97753	7
9	1.54	23.37	5.33	22.32	6.11	23.07	6.15	23.09	8.09	0.57	6.23	22.39	2.49	12.36	2.08	10.58	21.49	7.41		
	3.076	17.36	4.409	24.02	5.021	23.88	5.078	23.71	6.895	23.09	4.891	21.21	22.067	-12.65	20.895	-17.39	17.123	-12.60	15.10895	9
11	1.41	23.50	5.30	22.27	6.11	23.12	6.12	23.08	8.03	0.50	6.16	22.32	2.41	12.29	1.60	10.50	21.41	7.33		
	3.207	17.88	4.476	23.92	5.196	24.18	5.175	23.84	6.920	23.06	4.908	21.24	22.069	-12.63	20.895	-17.39	17.120	-12.59	15.24037	11
13	1.27	0.17	5.26	22.20	6.11	23.17	6.09	23.07	7.57	0.44	6.09	22.26	2.33	12.21	1.52	10.42	21.33	7.25		
	3.337	18.39	4.520	23.69	5.371	24.44	5.271	23.96	6.946	23.03	4.925	21.27	22.071	-12.62	20.895	-17.39	17.117	-12.59	15.37179	13
15	1.09	1.28	5.23	22.11	6.12	23.21	6.06	23.06	7.51	0.37	6.02	22.19	2.26	12.13	1.44	10.34	21.25	7.17		
	3.469	18.87	4.540	23.35	5.547	24.65	5.368	24.07	6.972	22.99	4.943	21.30	22.073	-12.61	20.895	-17.39	17.114	-12.58	15.50321	15
17	*****	*****	5.18	21.59	6.14	23.25	6.04	23.05	7.45	0.31	5.55	22.13	2.18	12.06	1.36	10.26	21.17	7.09		
	3.601	19.33	4.538	22.89	5.723	24.81	5.465	24.16	6.998	22.96	4.961	21.33	22.075	-12.60	20.895	-17.39	17.111	-12.58	15.63463	17
19	*****	*****	5.13	21.45	6.15	23.29	6.01	23.03	7.39	0.24	5.48	22.06	2.10	11.58	1.28	10.18	21.09	7.01		
	3.734	19.77	4.515	22.33	5.900	24.92	5.562	24.23	7.025	22.92	4.979	21.36	22.077	-12.60	20.895	-17.39	17.107	-12.57	15.76605	19
21	*****	*****	5.08	21.30	6.17	23.32	5.58	23.02	7.33	0.18	5.41	21.59	2.02	11.50	1.20	10.10	21.01	6.53		
	3.867	20.19	4.473	21.68	6.076	24.99	5.659	24.30	7.052	22.88	4.997	21.39	22.078	-12.59	20.894	-17.40	17.104	-12.57	15.89747	21
23	*****	*****	5.02	21.14	6.20	23.35	5.56	22.60	7.27	0.11	5.34	21.53	1.54	11.43	1.13	10.02	20.52	6.45		
	4.001	20.58	4.417	20.97	6.252	25.01	5.756	24.35	7.079	22.85	5.015	21.42	22.080	-12.59	20.894	-17.40	17.101	-12.56	16.02889	23
25	*****	*****	4.55	20.57	6.23	23.38	5.53	22.58	7.21	0.05	5.27	21.46	1.47	11.35	1.05	9.55	20.44	6.37		
	4.135	20.95	4.351	20.23	6.428	24.99	5.852	24.38	7.107	22.80	5.033	21.45	22.081	-12.58	20.893	-17.40	17.097	-12.56	16.16031	25
27	*****	*****	4.48	20.39	6.26	23.40	5.51	22.56	7.15	23.54	5.20	21.40	1.39	11.27	0.57	9.47	20.36	6.29		
	4.270	21.30	4.279	19.47	6.603	24.91	5.949	24.41	7.135	22.76	5.051	21.48	22.081	-12.58	20.892	-17.41	17.094	-12.55	16.29173	27
29	*****	*****	4.41	20.22	6.30	23.41	5.49	22.54	7.09	23.48	5.13	21.33	1.31	11.19	0.49	9.39	20.28	6.21		
	4.406	21.62	4.208	18.75	6.778	24.79	6.045	24.42	7.164	22.72	5.069	21.51	22.082	-12.58	20.891	-17.41	17.090	-12.55	16.42315	29
31	*****	*****	4.34	20.06	6.34	23.42	5.47	22.52	7.04	23.41	5.06	21.27	1.23	11.11	0.41	9.31	20.20	6.13		
	4.542	21.92	4.142	18.08	6.952	24.62	6.142	24.41	7.192	22.67	5.088	21.54	22.082	-12.58	20.890	-17.42	17.087	-12.55	16.55458	31

CZERWIEC 2002

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2452																			
152	1	Sob	427	3.53068	2.18	4.3636	22.03	1.01402	21.4819	-18.21	62.466	5.9	65	426	1243.4	2102	131	543.3	1004	154	1	
153	2	Nie	428	3.57034	2.09	4.4042	22.11	1.01418	22.3556	-14.23	62.975	6.9	56	425	1243.6	2103	152	629.1	1116	150	2	
154	3	Pon	429	4.00599	1.59	4.4448	22.19	1.01433	23.2110	-9.55	63.298	0.4	46	424	1243.8	2104	209	712.1	1227	146	3	
155	4	Wto	430	4.04565	1.49	4.4855	22.26	1.01448	0.0452	-5.07	63.422	1.4	37	424	1243.9	2105	223	753.2	1336	142	4	
156	5	Śro	431	4.08530	1.39	4.5302	22.33	1.01462	0.4754	-0.08	63.350	2.4	28	423	1244.1	2106	236	833.4	1445	139	5	
157	6	Czw	432	4.12496	1.28	4.5709	22.39	1.01476	1.3112	4.53	63.099	3.4	20	422	1244.3	2107	248	913.8	1555	135	6	
158	7	Pią	433	4.16461	1.17	5.0117	22.45	1.01490	2.1543	9.48	62.696	4.4	13	422	1244.5	2108	301	955.4	1706	131	7	
159	8	Sob	434	4.20427	1.05	5.0525	22.51	1.01503	3.0217	14.24	62.181	5.4	7	421	1244.7	2109	316	1039.1	1819	127	8	
160	9	Nie	435	4.24393	0.53	5.0933	22.56	1.01515	3.5139	18.29	61.593	6.4	3	421	1244.9	2110	335	1125.9	1935	123	9	
161	10	Pon	436	4.28358	0.42	5.1342	23.01	1.01527	4.4417	21.48	60.976	7.4	0	420	1245.1	2110	359	1216.3	2049	119	10	
162	11	Wto	437	4.32324	0.29	5.1750	23.05	1.01538	5.4008	24.04	60.369	0.4	0	420	1245.3	2111	431	1310.2	2159	115	11	
163	12	Śro	438	4.36289	0.17	5.2159	23.09	1.01548	6.3829	25.02	59.804	1.4	2	419	1245.5	2112	515	1406.9	2300	111	12	
164	13	Czw	439	4.40255	0.04	5.2608	23.13	1.01559	7.3805	24.33	59.302	2.4	7	419	1245.7	2113	614	1504.8	2347	107	13	
165	14	Pią	440	4.44221	-0.08	5.3018	23.16	1.01568	8.3723	22.36	58.874	3.4	13	419	1245.9	2113	726	1602.2	****	103	14	
166	15	Sob	441	4.48186	-0.21	5.3427	23.19	1.01577	9.3509	19.17	58.525	4.4	22	419	1246.1	2114	846	1657.7	023	059	15	
167	16	Nie	442	4.52152	-0.34	5.3836	23.21	1.01585	10.3046	14.51	58.253	5.4	32	419	1246.3	2114	1011	1750.8	050	055	16	
168	17	Pon	443	4.56117	-0.47	5.4246	23.23	1.01593	11.2419	9.35	58.057	6.4	43	419	1246.5	2115	1136	1841.7	111	051	17	
169	18	Wto	444	5.00083	-1.00	5.4656	23.24	1.01601	12.1625	3.47	57.938	0.4	55	419	1246.7	2115	1300	1931.2	128	047	18	
170	19	Śro	445	5.04048	-1.13	5.5105	23.25	1.01608	13.0759	-2.13	57.903	1.4	66	419	1247.0	2115	1425	2020.5	144	044	19	
171	20	Czw	446	5.08014	-1.26	5.5515	23.26	1.01614	13.5959	-8.07	57.962	2.4	76	419	1247.2	2116	1550	2110.7	200	040	20	
172	21	Pią	447	5.11579	-1.39	5.5924	23.26	1.01620	14.5321	-13.34	58.131	3.4	85	419	1247.4	2116	1715	2202.7	218	036	21	
173	22	Sob	448	5.15545	-1.52	6.0334	23.26	1.01626	15.4841	-18.16	58.418	4.4	92	419	1247.6	2116	1840	2257.0	238	032	22	
174	23	Nie	449	5.19511	-2.05	6.0743	23.26	1.01632	16.4607	-21.54	58.830	5.4	97	419	1247.8	2116	2002	2353.4	304	028	23	
175	24	Pon	450	5.23476	-2.18	6.1153	23.25	1.01637	17.4503	-24.12	59.357	6.4	100	420	1248.0	2116	2115	*****	339	024	24	
176	25	Wto	451	5.27442	-2.31	6.1602	23.23	1.01642	18.4419	-25.03	59.979	0.5	100	420	1248.3	2116	2214	051.0	425	020	25	
177	26	Śro	452	5.31408	-2.43	6.2011	23.21	1.01646	19.4224	-24.27	60.659	1.5	97	420	1248.5	2116	2259	148.0	523	016	26	
178	27	Czw	453	5.35373	-2.56	6.2420	23.19	1.01650	20.3759	-22.33	61.353	2.5	93	421	1248.7	2116	2332	242.8	632	012	27	
179	28	Pią	454	5.39339	-3.08	6.2829	23.17	1.01654	21.3025	-19.35	62.011	3.5	87	421	1248.9	2116	2356	334.2	744	008	28	
180	29	Sob	455	5.43304	-3.20	6.3238	23.14	1.01657	22.1936	-15.48	62.582	4.5	80	422	1249.1	2116	****	422.1	858	004	29	
181	30	Nie	456	5.47270	-3.32	6.3646	23.10	1.01660	23.0600	-11.27	63.022	5.5	71	423	1249.3	2116	014	506.6	1010	000	30	

Fazy Księżyca [Dm, h.mm]: 3kw 3, 2.05 Now 11, 1.47 1kw 18, 2.29 Pełn 24, 23.42

CZERWIEC 2002 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	
Dm	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	Dm
1	*****	*****	4.30	19.58	6.36	23.43	5.46	22.51	7.01	23.38	5.03	21.23	1.19	11.07	0.37	9.27	20.16	6.09		
	4.610	22.06	4.113	17.77	7.039	24.52	6.190	24.41	7.207	22.65	5.097	21.55	22.083	-12.58	20.889	-17.42	17.085	-12.54	16.62029	1
3	*****	*****	4.22	19.44	6.40	23.43	5.44	22.49	6.55	23.31	4.56	21.17	1.11	10.60	0.29	9.19	20.08	6.00		
	4.747	22.31	4.062	17.24	7.212	24.28	6.286	24.38	7.236	22.60	5.116	21.58	22.083	-12.58	20.888	-17.42	17.081	-12.54	16.75171	3
5	*****	*****	4.15	19.31	6.45	23.43	5.42	22.46	6.49	23.25	4.49	21.10	1.03	10.52	0.21	9.11	19.60	5.52		
	4.884	22.55	4.027	16.83	7.383	24.00	6.382	24.34	7.265	22.55	5.134	21.60	22.083	-12.58	20.886	-17.43	17.078	-12.54	16.88312	5
7	*****	*****	4.08	19.21	6.50	23.43	5.40	22.44	6.43	23.18	4.42	21.04	0.56	10.44	0.13	9.03	19.52	5.44		
	5.021	22.75	4.008	16.56	7.554	23.67	6.478	24.29	7.294	22.50	5.153	21.63	22.082	-12.58	20.884	-17.44	17.074	-12.54	17.01454	7
9	*****	*****	4.01	19.12	6.55	23.42	5.39	22.41	6.38	23.12	4.35	20.57	0.48	10.36	0.05	8.55	19.44	5.36		
	5.159	22.93	4.008	16.42	7.723	23.30	6.573	24.23	7.324	22.45	5.171	21.65	22.082	-12.59	20.883	-17.45	17.070	-12.53	17.14596	9
11	*****	*****	3.54	19.05	7.00	23.41	5.37	22.38	6.32	23.05	4.28	20.51	0.40	10.28	23.54	8.47	19.36	5.28		
	5.297	23.09	4.027	16.41	7.891	22.89	6.668	24.15	7.354	22.39	5.190	21.68	22.081	-12.59	20.881	-17.45	17.067	-12.53	17.27739	11
13	*****	*****	3.48	19.00	7.06	23.40	5.36	22.35	6.26	22.59	4.21	20.44	0.32	10.20	23.46	8.39	19.27	5.20		
	5.436	23.21	4.065	16.54	8.058	22.44	6.764	24.06	7.384	22.33	5.208	21.70	22.080	-12.60	20.879	-17.46	17.063	-12.53	17.40881	13
15	*****	*****	3.42	18.58	7.12	23.38	5.34	22.32	6.21	22.52	4.14	20.37	0.24	10.12	23.38	8.31	19.19	5.12		
	5.574	23.31	4.123	16.79	8.223	21.95	6.858	23.96	7.414	22.28	5.227	21.73	22.079	-12.61	20.876	-17.47	17.060	-12.53	17.54024	15
17	*****	*****	3.36	18.57	7.18	23.36	5.33	22.29	6.15	22.46	4.07	20.31	0.16	10.04	23.30	8.23	19.11	5.04		
	5.713	23.38	4.201	17.15	8.386	21.42	6.953	23.85	7.445	22.22	5.245	21.75	22.077	-12.61	20.874	-17.48	17.056	-12.53	17.67165	17
19	*****	*****	3.31	18.57	7.23	23.34	5.32	22.26	6.10	22.39	4.00	20.24	0.08	9.56	23.22	8.14	19.03	4.56		
	5.851	23.42	4.297	17.60	8.548	20.85	7.047	23.72	7.475	22.16	5.264	21.77	22.076	-12.62	20.872	-17.49	17.053	-12.53	17.80307	19
21	*****	*****	3.27	18.60	7.29	23.31	5.31	22.23	6.04	22.33	3.53	20.18	23.56	9.48	23.14	8.06	18.55	4.48		
	5.990	23.44	4.412	18.13	8.708	20.25	7.141	23.58	7.506	22.09	5.282	21.79	22.074	-12.64	20.869	-17.50	17.049	-12.53	17.93449	21
23	*****	*****	3.23	19.04	7.35	23.29	5.30	22.19	5.59	22.26	3.46	20.11	23.49	9.40	23.06	7.58	18.47	4.40		
	6.129	23.43	4.546	18.72	8.867	19.61	7.235	23.43	7.537	22.03	5.301	21.81	22.072	-12.65	20.867	-17.51	17.046	-12.53	18.06591	23
25	*****	*****	3.20	19.10	7.42	23.26	5.29	22.16	5.53	22.20	3.39	20.04	23.41	9.32	22.58	7.50	18.39	4.32		
	6.267	23.39	4.698	19.36	9.023	18.94	7.328	23.26	7.568	21.96	5.319	21.83	22.070	-12.66	20.864	-17.52	17.042	-12.54	18.19734	25
27	*****	*****	3.18	19.17	7.48	23.22	5.28	22.12	5.48	22.13	3.33	19.58	23.33	9.24	22.50	7.42	18.31	4.24		
	6.406	23.32	4.868	20.02	9.178	18.24	7.421	23.09	7.599	21.90	5.337	21.85	22.068	-12.67	20.861	-17.53	17.039	-12.54	18.32876	27
29	*****	*****	3.16	19.25	7.54	23.19	5.27	22.08	5.42	22.07	3.26	19.51	23.25	9.16	22.42	7.34	18.23	4.16		
	6.544	23.23	5.058	20.69	9.331	17.51	7.514	22.90	7.630	21.83	5.356	21.87	22.065	-12.69	20.858	-17.55	17.036	-12.54	18.46018	29

LIPIEC 2002

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
182	1	Pon	457	5.51235	-3.44	6.4055	23.06	1.01663	23.5022	-6.43	63.293	6.5	62	423	1249.5	2115	029	548.7	1121	2352	1
183	2	Wto	458	5.55201	-3.55	6.4503	23.02	1.01665	0.3334	-1.46	63.374	7.5	53	424	1249.7	2115	042	629.3	1230	2348	2
184	3	Śro	459	5.59167	-4.07	6.4910	22.57	1.01667	1.1634	3.15	63.253	0.7	43	425	1249.9	2114	055	709.4	1339	2345	3
185	4	Czw	460	6.03132	-4.18	6.5318	22.52	1.01668	2.0019	8.11	62.937	1.7	34	426	1250.0	2114	108	750.1	1449	2341	4
186	5	Pią	461	6.07098	-4.28	6.5725	22.47	1.01669	2.4546	12.53	62.447	2.7	25	427	1250.2	2113	122	832.5	1600	2337	5
187	6	Sob	462	6.11063	-4.39	7.0132	22.41	1.01669	3.3348	17.09	61.820	3.7	17	428	1250.4	2113	138	917.6	1714	2333	6
188	7	Nie	463	6.15029	-4.48	7.0539	22.35	1.01668	4.2508	20.45	61.101	4.7	10	428	1250.6	2112	159	1006.2	1830	2329	7
189	8	Pon	464	6.18595	-4.58	7.0945	22.28	1.01667	5.2002	23.24	60.346	5.7	5	429	1250.7	2111	228	1058.8	1943	2325	8
190	9	Wto	465	6.22560	-5.07	7.1350	22.21	1.01666	6.1809	24.51	59.611	6.7	1	431	1250.9	2111	307	1155.1	2048	2321	9
191	10	Śro	466	6.26526	-5.16	7.1756	22.14	1.01664	7.1824	24.51	58.949	7.7	0	432	1251.0	2110	400	1253.7	2142	2317	10
192	11	Czw	467	6.30491	-5.25	7.2201	22.06	1.01661	8.1910	23.19	58.405	1.0	1	433	1251.2	2109	509	1352.8	2223	2313	11
193	12	Pią	468	6.34457	-5.32	7.2605	21.58	1.01657	9.1849	20.18	58.006	2.0	5	434	1251.3	2108	629	1450.5	2253	2309	12
194	13	Sob	469	6.38423	-5.40	7.3009	21.49	1.01653	10.1619	16.02	57.764	3.0	11	435	1251.4	2107	755	1545.8	2317	2305	13
195	14	Nie	470	6.42388	-5.47	7.3413	21.40	1.01648	11.1123	10.50	57.674	4.0	20	436	1251.5	2106	922	1638.4	2335	2301	14
196	15	Pon	471	6.46354	-5.53	7.3816	21.31	1.01643	12.0426	5.03	57.719	5.0	30	437	1251.6	2105	1048	1728.9	2352	2257	15
197	16	Wto	472	6.50319	-5.59	7.4218	21.22	1.01638	12.5617	-0.58	57.877	6.0	41	439	1251.7	2104	1213	1818.3	****	2253	16
198	17	Śro	473	6.54285	-6.05	7.4620	21.12	1.01631	13.4754	-6.53	58.123	0.2	52	440	1251.8	2103	1337	1907.7	007	2249	17
199	18	Czw	474	6.58250	-6.10	7.5022	21.01	1.01625	14.4017	-12.24	58.440	1.2	64	441	1251.9	2102	1501	1958.3	024	2246	18
200	19	Pią	475	7.02216	-6.14	7.5423	20.50	1.01617	15.3410	-17.14	58.815	2.2	74	443	1252.0	2100	1625	2050.7	043	2242	19
201	20	Sob	476	7.06181	-6.18	7.5823	20.39	1.01610	16.2956	-21.04	59.241	3.2	83	444	1252.0	2059	1746	2145.2	107	2238	20
202	21	Nie	477	7.10147	-6.21	8.0223	20.28	1.01602	17.2723	-23.42	59.714	4.2	90	446	1252.1	2058	1901	2241.3	137	2234	21
203	22	Pon	478	7.14113	-6.23	8.0622	20.16	1.01594	18.2540	-24.57	60.229	5.2	96	447	1252.1	2056	2005	2337.8	218	2230	22
204	23	Wto	479	7.18078	-6.25	8.1020	20.04	1.01585	19.2330	-24.47	60.777	6.2	99	448	1252.2	2055	2055	*****	311	2226	23
205	24	Śro	480	7.22044	-6.27	8.1418	19.52	1.01576	20.1934	-23.17	61.343	0.0	100	450	1252.2	2053	2131	032.9	415	2222	24
206	25	Czw	481	7.26009	-6.28	8.1816	19.39	1.01567	21.1256	-20.38	61.904	1.0	99	451	1252.2	2052	2158	125.5	527	2218	25
207	26	Pią	482	7.29575	-6.28	8.2212	19.26	1.01557	22.0314	-17.04	62.427	2.0	96	453	1252.2	2050	2219	214.8	640	2214	26
208	27	Sob	483	7.33541	-6.27	8.2608	19.12	1.01547	22.5039	-12.51	62.878	3.0	91	454	1252.2	2049	2235	300.8	754	2210	27
209	28	Nie	484	7.37506	-6.26	8.3004	18.59	1.01537	23.3546	-8.10	63.220	4.0	85	456	1252.2	2047	2249	344.0	905	2206	28
210	29	Pon	485	7.41472	-6.25	8.3359	18.45	1.01527	0.1921	-3.15	63.419	5.0	77	458	1252.2	2046	2301	425.2	1015	2202	29
211	30	Wto	486	7.45437	-6.23	8.3753	18.30	1.01516	1.0216	1.46	63.447	6.0	69	459	1252.1	2044	2313	505.4	1124	2158	30
212	31	Śro	487	7.49403	-6.20	8.4147	18.16	1.01505	1.4526	6.43	63.286	7.0	60	501	1252.1	2042	2327	545.5	1233	2154	31

Fazy Księżyca [Dm, h.mm]: 3kw 2, 19.19 Now 10, 12.26 1kw 17, 6.47 Pełn 24, 11.07

LIPIEC 2002 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	*****	*****	3.16	19.34	7.60	23.15	5.26	22.04	5.37	22.00	3.19	19.44	23.17	9.08	22.34	7.26	18.15	4.07		
	6.682	23.11	5.266	21.34	9.482	16.76	7.606	22.70	7.661	21.76	5.374	21.89	22.063	-12.70	20.856	-17.56	17.032	-12.54	18.59160	1
3	*****	*****	3.17	19.44	8.06	23.11	5.25	22.00	5.31	21.54	3.12	19.38	23.09	8.59	22.26	7.18	18.07	3.59		
	6.820	22.96	5.492	21.96	9.632	15.97	7.698	22.49	7.693	21.68	5.392	21.90	22.060	-12.72	20.852	-17.57	17.029	-12.55	18.72302	3
5	*****	*****	3.20	19.55	8.12	23.07	5.25	21.56	5.26	21.47	3.05	19.31	23.01	8.51	22.18	7.10	17.59	3.51		
	6.957	22.78	5.736	22.51	9.780	15.17	7.790	22.27	7.724	21.61	5.409	21.92	22.057	-12.74	20.849	-17.58	17.026	-12.55	18.85444	5
7	*****	*****	3.24	20.06	8.18	23.03	5.24	21.52	5.20	21.41	2.58	19.24	22.53	8.43	22.10	7.01	17.51	3.43		
	7.094	22.58	5.997	22.97	9.926	14.34	7.881	22.03	7.755	21.54	5.427	21.94	22.054	-12.76	20.846	-17.60	17.023	-12.55	18.98586	7
9	*****	*****	3.30	20.18	8.24	22.59	5.23	21.48	5.15	21.34	2.51	19.18	22.45	8.35	22.02	6.53	17.43	3.35		
	7.231	22.35	6.274	23.31	10.070	13.49	7.972	21.79	7.787	21.46	5.445	21.95	22.050	-12.77	20.843	-17.61	17.020	-12.56	19.11729	9
11	*****	*****	3.38	20.29	8.30	22.54	5.23	21.43	5.09	21.28	2.44	19.11	22.37	8.27	21.54	6.45	17.35	3.27		
	7.367	22.10	6.564	23.52	10.213	12.61	8.063	21.54	7.818	21.38	5.462	21.97	22.047	-12.79	20.840	-17.62	17.017	-12.56	19.24871	11
13	*****	*****	3.48	20.39	8.35	22.49	5.22	21.39	5.04	21.21	2.37	19.04	22.29	8.19	21.46	6.37	17.27	3.19		
	7.503	21.82	6.864	23.56	10.354	11.72	8.153	21.27	7.850	21.30	5.480	21.98	22.043	-12.82	20.836	-17.64	17.014	-12.57	19.38013	13
15	*****	*****	3.59	20.49	8.41	22.45	5.22	21.35	4.59	21.15	2.30	18.58	22.21	8.10	21.38	6.29	17.19	3.11		
	7.638	21.52	7.170	23.43	10.493	10.82	8.243	21.00	7.881	21.22	5.497	21.99	22.040	-12.84	20.833	-17.65	17.011	-12.58	19.51155	15
17	*****	*****	4.13	20.57	8.47	22.40	5.21	21.30	4.53	21.08	2.23	18.51	22.13	8.02	21.30	6.21	17.11	3.03		
	7.772	21.19	7.480	23.11	10.631	9.90	8.332	20.71	7.912	21.14	5.514	22.01	22.036	-12.86	20.829	-17.67	17.009	-12.58	19.64297	17
19	*****	*****	4.27	21.04	8.52	22.35	5.21	21.25	4.48	21.01	2.16	18.44	22.05	7.54	21.22	6.13	17.03	2.55		
	7.906	20.84	7.788	22.61	10.768	8.96	8.421	20.42	7.944	21.06	5.530	22.02	22.032	-12.88	20.826	-17.68	17.006	-12.59	19.77439	19
21	*****	*****	4.42	21.09	8.58	22.30	5.21	21.21	4.42	20.55	2.09	18.37	21.57	7.46	21.14	6.04	16.55	2.47		
	8.040	20.47	8.092	21.95	10.902	8.01	8.509	20.11	7.975	20.97	5.547	22.03	22.027	-12.90	20.822	-17.69	17.004	-12.60	19.90581	21
23	*****	*****	4.58	21.13	9.03	22.25	5.20	21.16	4.37	20.48	2.02	18.30	21.49	7.37	21.06	5.56	16.47	2.39		
	8.172	20.07	8.388	21.13	11.036	7.06	8.597	19.80	8.006	20.89	5.563	22.04	22.023	-12.93	20.819	-17.71	17.001	-12.60	20.03723	23
25	*****	*****	5.14	21.15	9.09	22.19	5.20	21.11	4.32	20.42	1.55	18.24	21.41	7.29	20.58	5.48	16.39	2.31		
	8.304	19.65	8.675	20.17	11.168	6.09	8.685	19.48	8.038	20.80	5.580	22.05	22.019	-12.95	20.815	-17.72	16.999	-12.61	20.16866	25
27	*****	*****	5.30	21.17	9.14	22.14	5.19	21.06	4.26	20.35	1.49	18.17	21.33	7.21	20.50	5.40	16.31	2.23		
	8.436	19.21	8.952	19.10	11.298	5.12	8.772	19.15	8.069	20.71	5.595	22.06	22.014	-12.98	20.812	-17.74	16.997	-12.62	20.30008	27
29	1.07	0.05	5.46	21.17	9.19	22.09	5.19	21.01	4.21	20.28	1.42	18.10	21.25	7.13	20.42	5.32	16.23	2.15		
	8.566	18.74	9.218	17.94	11.428	4.14	8.859	18.81	8.100	20.62	5.611	22.07	22.010	-13.00	20.808	-17.75	16.995	-12.63	20.43149	29
31	1.33	-0.05	6.02	21.16	9.24	22.03	5.19	20.56	4.16	20.22	1.35	18.03	21.17	7.04	20.34	5.23	16.15	2.07		
	8.696	18.26	9.472	16.70	11.556	3.15	8.946	18.46	8.131	20.53	5.627	22.08	22.005	-13.03	20.804	-17.77	16.993	-12.64	20.56291	31

SIERPIEŃ 2002

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
2452																						
213	1	Czw	488	7.53368	-6.17	8.4541	18.01	1.01493	2.2947	11.28	62.930	8.0	50	502	1252.0	2041	2342	626.7	1343	2151	1	
214	2	Pią	489	7.57334	-6.13	8.4933	17.45	1.01481	3.1616	15.51	62.389	1.0	41	504	1252.0	2039	****	710.0	1455	2147	2	
215	3	Sob	490	8.01299	-6.08	8.5325	17.30	1.01468	4.0540	19.39	61.689	2.0	31	506	1251.9	2037	000	756.3	1609	2143	3	
216	4	Nie	491	8.05265	-6.03	8.5717	17.14	1.01455	4.5834	22.38	60.871	3.0	22	507	1251.8	2035	025	846.4	1723	2139	4	
217	5	Pon	492	8.09231	-5.58	9.0108	16.58	1.01441	5.5502	24.32	59.990	4.0	14	509	1251.7	2033	058	940.4	1831	2135	5	
218	6	Wto	493	8.13196	-5.51	9.0458	16.42	1.01427	6.5426	25.05	59.114	5.0	7	511	1251.6	2031	145	1037.9	1931	2131	6	
219	7	Śro	494	8.17162	-5.44	9.0848	16.25	1.01413	7.5528	24.07	58.312	6.0	3	512	1251.5	2030	247	1137.4	2017	2127	7	
220	8	Czw	495	8.21127	-5.37	9.1237	16.08	1.01397	8.5626	21.35	57.651	7.0	0	514	1251.4	2028	403	1236.7	2053	2123	8	
221	9	Pią	496	8.25093	-5.29	9.1625	15.51	1.01382	9.5557	17.37	57.182	0.6	1	516	1251.2	2026	529	1334.4	2119	2119	9	
222	10	Sob	497	8.29058	-5.20	9.2013	15.33	1.01365	10.5315	12.32	56.938	1.6	4	517	1251.1	2024	659	1429.6	2140	2115	10	
223	11	Nie	498	8.33024	-5.11	9.2401	15.16	1.01349	11.4823	6.42	56.923	2.6	10	519	1250.9	2022	828	1522.4	2157	2111	11	
224	12	Pon	499	8.36589	-5.01	9.2747	14.58	1.01331	12.4155	0.32	57.118	3.6	18	521	1250.8	2020	956	1613.6	2213	2107	12	
225	13	Wto	500	8.40555	-4.51	9.3134	14.40	1.01314	13.3443	-5.37	57.488	4.6	28	522	1250.6	2018	1123	1704.1	2230	2103	13	
226	14	Śro	501	8.44520	-4.40	9.3519	14.21	1.01295	14.2742	-11.22	57.984	5.6	39	524	1250.4	2016	1249	1755.1	2248	2059	14	
227	15	Czw	502	8.48486	-4.29	9.3904	14.03	1.01277	15.2140	-16.24	58.560	6.6	50	526	1250.2	2013	1414	1847.3	2310	2055	15	
228	16	Pią	503	8.52452	-4.17	9.4249	13.44	1.01258	16.1702	-20.29	59.175	1.0	61	527	1250.0	2011	1536	1941.1	2338	2052	16	
229	17	Sob	504	8.56417	-4.04	9.4633	13.25	1.01238	17.1348	-23.22	59.796	2.0	71	529	1249.8	2009	1653	2036.3	****	2048	17	
230	18	Nie	505	9.00383	-3.51	9.5016	13.05	1.01219	18.1121	-24.54	60.405	3.0	80	531	1249.6	2007	1759	2132.0	015	2044	18	
231	19	Pon	506	9.04348	-3.37	9.5359	12.46	1.01199	19.0838	-25.03	60.987	4.0	88	533	1249.4	2005	1853	2226.9	104	2040	19	
232	20	Wto	507	9.08314	-3.23	9.5742	12.26	1.01178	20.0430	-23.52	61.537	5.0	94	534	1249.1	2003	1932	2319.7	204	2036	20	
233	21	Śro	508	9.12279	-3.09	10.0124	12.06	1.01158	20.5802	-21.30	62.047	6.0	98	536	1248.9	2001	2002	*****	313	2032	21	
234	22	Czw	509	9.16245	-2.54	10.0505	11.46	1.01137	21.4845	-18.10	62.512	7.0	100	538	1248.6	1958	2024	009.6	426	2028	22	
235	23	Pią	510	9.20210	-2.38	10.0846	11.26	1.01116	22.3642	-14.05	62.918	0.5	100	539	1248.4	1956	2041	056.4	539	2024	23	
236	24	Sob	511	9.24176	-2.22	10.1227	11.06	1.01095	23.2219	-9.30	63.249	1.5	98	541	1248.1	1954	2055	140.4	651	2020	24	
237	25	Nie	512	9.28141	-2.06	10.1607	10.45	1.01074	0.0614	-4.36	63.484	2.5	94	543	1247.8	1952	2108	222.1	802	2016	25	
238	26	Pon	513	9.32107	-1.49	10.1947	10.24	1.01052	0.4913	0.26	63.600	3.5	89	545	1247.6	1949	2120	302.6	911	2012	26	
239	27	Wto	514	9.36072	-1.32	10.2326	10.03	1.01031	1.3207	5.27	63.571	4.5	83	546	1247.3	1947	2132	342.5	1020	2008	27	
240	28	Śro	515	9.40038	-1.14	10.2705	9.42	1.01009	2.1546	10.16	63.380	5.5	75	548	1247.0	1945	2146	423.0	1130	2004	28	
241	29	Czw	516	9.44003	-0.57	10.3044	9.21	1.00987	3.0103	14.45	63.013	6.5	66	550	1246.7	1942	2203	504.9	1240	2000	29	
242	30	Pią	517	9.47569	-0.38	10.3422	8.60	1.00964	3.4843	18.42	62.467	7.5	57	551	1246.4	1940	2224	549.3	1353	1956	30	
243	31	Sob	518	9.51535	-0.20	10.3800	8.38	1.00942	4.3927	21.56	61.756	0.3	47	553	1246.1	1938	2252	636.8	1505	1953	31	

Fazy Księżyca [Dm, h.mm]: 3kw 1, 12.22 Now 8, 21.15 1kw 15, 12.12 Pełn 23, 0.29 3kw 31, 4.31

SIERPIEŃ 2002 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE			MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST (0^h UT) Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach		
1	1.42	23.56	6.09	21.15	9.26	22.00	5.18	20.54	4.13	20.18	1.31	17.60	21.13	7.00	20.30	5.19	16.11	2.03		
	8.761	18.01	9.595	16.05	11.619	2.66	8.989	18.28	8.146	20.49	5.634	22.08	22.003	-13.04	20.802	-17.78	16.992	-12.64	20.62862	1
3	1.55	23.44	6.24	21.14	9.31	21.55	5.18	20.48	4.08	20.12	1.24	17.53	21.05	6.52	20.22	5.11	16.03	1.55		
	8.890	17.50	9.833	14.72	11.745	1.67	9.075	17.92	8.177	20.40	5.649	22.09	21.998	-13.07	20.799	-17.79	16.991	-12.65	20.76004	3
5	2.07	23.33	6.38	21.11	9.36	21.49	5.18	20.43	4.02	20.05	1.17	17.46	20.57	6.43	20.14	5.03	15.55	1.47		
	9.019	16.96	10.061	13.35	11.870	0.67	9.161	17.55	8.208	20.31	5.664	22.09	21.993	-13.09	20.795	-17.81	16.989	-12.66	20.89146	5
7	2.17	23.23	6.51	21.08	9.41	21.43	5.18	20.38	3.57	19.58	1.10	17.39	20.49	6.35	20.06	4.55	15.48	1.39		
	9.147	16.41	10.279	11.96	11.993	-0.32	9.246	17.17	8.238	20.21	5.679	22.10	21.988	-13.12	20.791	-17.82	16.988	-12.67	21.02289	7
9	2.26	23.13	7.04	21.04	9.46	21.38	5.17	20.33	3.51	19.52	1.03	17.32	20.41	6.27	19.58	4.47	15.40	1.31		
	9.274	15.85	10.487	10.54	12.116	-1.31	9.331	16.79	8.269	20.12	5.693	22.11	21.983	-13.15	20.788	-17.83	16.986	-12.68	21.15431	9
11	2.35	23.04	7.16	21.00	9.51	21.32	5.17	20.28	3.46	19.45	0.56	17.25	20.33	6.18	19.50	4.39	15.32	1.23		
	9.400	15.26	10.686	9.12	12.237	-2.30	9.415	16.40	8.299	20.02	5.707	22.11	21.978	-13.18	20.784	-17.85	16.985	-12.70	21.28572	11
13	2.43	22.56	7.28	20.56	9.55	21.26	5.17	20.22	3.41	19.38	0.49	17.18	20.25	6.10	19.42	4.30	15.24	1.15		
	9.526	14.66	10.877	7.70	12.357	-3.28	9.499	16.00	8.329	19.93	5.720	22.12	21.973	-13.20	20.781	-17.86	16.984	-12.71	21.41714	13
15	2.50	22.48	7.38	20.51	9.60	21.20	5.16	20.17	3.35	19.31	0.42	17.11	20.17	6.02	19.34	4.22	15.16	1.07		
	9.651	14.04	11.060	6.28	12.476	-4.26	9.583	15.60	8.359	19.83	5.733	22.12	21.968	-13.23	20.777	-17.88	16.983	-12.72	21.54856	15
17	2.58	22.40	7.49	20.46	10.04	21.14	5.16	20.11	3.30	19.25	0.34	17.04	20.09	5.54	19.26	4.14	15.08	0.59		
	9.776	13.41	11.235	4.88	12.593	-5.23	9.666	15.18	8.389	19.74	5.746	22.12	21.963	-13.26	20.773	-17.89	16.982	-12.73	21.67998	17
19	3.04	22.32	7.58	20.41	10.08	21.08	5.16	20.06	3.24	19.18	0.27	16.57	20.01	5.45	19.18	4.06	15.00	0.51		
	9.900	12.76	11.403	3.50	12.710	-6.19	9.749	14.77	8.419	19.64	5.759	22.13	21.958	-13.28	20.770	-17.91	16.982	-12.74	21.81140	19
21	3.11	22.25	8.07	20.36	10.12	21.01	5.15	20.00	3.19	19.11	0.20	16.50	19.53	5.37	19.11	3.58	14.53	0.43		
	10.023	12.11	11.562	2.14	12.825	-7.15	9.832	14.34	8.448	19.54	5.771	22.13	21.953	-13.31	20.767	-17.92	16.981	-12.76	21.94282	21
23	3.17	22.18	8.15	20.30	10.16	20.55	5.15	19.55	3.13	19.04	0.13	16.42	19.45	5.29	19.03	3.50	14.45	0.35		
	10.146	11.43	11.715	0.83	12.938	-8.09	9.914	13.91	8.477	19.45	5.783	22.13	21.947	-13.34	20.763	-17.93	16.981	-12.77	22.07424	23
25	3.23	22.11	8.23	20.24	10.20	20.49	5.15	19.49	3.08	18.58	0.06	16.35	19.37	5.20	18.55	3.41	14.37	0.27		
	10.269	10.75	11.860	-0.45	13.050	-9.02	9.996	13.48	8.506	19.35	5.794	22.13	21.942	-13.37	20.760	-17.95	16.981	-12.78	22.20566	25
27	3.29	22.04	8.30	20.18	10.24	20.43	5.14	19.44	3.03	18.51	23.55	16.28	19.29	5.12	18.47	3.33	14.29	0.19		
	10.391	10.05	11.996	-1.68	13.161	-9.93	10.078	13.03	8.535	19.25	5.806	22.14	21.937	-13.39	20.757	-17.96	16.980	-12.80	22.33707	27
29	3.35	21.57	8.36	20.11	10.28	20.36	5.14	19.38	2.57	18.44	23.47	16.21	19.21	5.04	18.39	3.25	14.21	0.11		
	10.512	9.35	12.125	-2.86	13.269	-10.84	10.160	12.59	8.563	19.15	5.816	22.14	21.932	-13.42	20.753	-17.97	16.980	-12.81	22.46849	29
31	3.40	21.50	8.41	20.04	10.32	20.30	5.14	19.32	2.52	18.37	23.40	16.14	19.13	4.55	18.31	3.17	14.14	0.03		
	10.633	8.63	12.244	-3.98	13.377	-11.72	10.241	12.14	8.591	19.05	5.826	22.14	21.927	-13.45	20.750	-17.99	16.981	-12.83	22.59991	31

WRZESIEŃ 2002

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)											Czas strefowy [hhmm.]							
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
244	1	Nie	519	9.55500	-0.01	10.4138	8.16	1.00919	5.3332	24.11	60.908	1.3	37	555	1245.8	1935	2332	728.0	1615	1949	1
245	2	Pon	520	9.59466	0.18	10.4516	7.54	1.00896	6.3044	25.14	59.967	2.3	27	557	1245.4	1933	****	822.8	1718	1945	2
246	3	Wto	521	10.03431	0.37	10.4853	7.32	1.00872	7.3014	24.52	58.998	3.3	18	558	1245.1	1931	025	920.3	1809	1941	3
247	4	Śro	522	10.07397	0.57	10.5230	7.10	1.00848	8.3041	22.57	58.073	4.3	10	600	1244.8	1928	135	1019.1	1849	1937	4
248	5	Czw	523	10.11363	1.17	10.5607	6.48	1.00824	9.3041	19.32	57.272	5.3	4	602	1244.5	1926	257	1117.5	1919	1933	5
249	6	Pią	524	10.15328	1.37	10.5943	6.26	1.00799	10.2916	14.48	56.669	6.3	1	603	1244.1	1924	426	1214.2	1942	1929	6
250	7	Sob	525	10.19293	1.57	11.0319	6.03	1.00774	11.2606	9.05	56.322	0.3	0	605	1243.8	1921	557	1309.1	2000	1925	7
251	8	Nie	526	10.23259	2.18	11.0655	5.41	1.00748	12.2127	2.47	56.257	1.3	3	607	1243.5	1919	728	1402.4	2017	1921	8
252	9	Pon	527	10.27224	2.38	11.1031	5.18	1.00723	13.1600	-3.40	56.473	2.3	8	609	1243.1	1917	859	1454.8	2034	1917	9
253	10	Wto	528	10.31190	2.59	11.1407	4.56	1.00696	14.1035	-9.49	56.933	3.3	15	610	1242.8	1914	1028	1547.3	2052	1913	10
254	11	Śro	529	10.35155	3.20	11.1743	4.33	1.00670	15.0553	-15.18	57.581	4.3	25	612	1242.4	1912	1157	1640.8	2112	1909	11
255	12	Czw	530	10.39121	3.41	11.2118	4.10	1.00643	16.0220	-19.47	58.350	5.3	35	614	1242.1	1909	1324	1735.6	2139	1905	12
256	13	Pią	531	10.43087	4.02	11.2454	3.47	1.00616	16.5955	-23.02	59.173	6.3	46	615	1241.7	1907	1444	1831.5	2213	1901	13
257	14	Sob	532	10.47052	4.24	11.2829	3.24	1.00589	17.5802	-24.55	59.992	0.7	57	617	1241.4	1904	1555	1927.8	2259	1858	14
258	15	Nie	533	10.51018	4.45	11.3204	3.01	1.00562	18.5543	-25.21	60.765	1.7	67	619	1241.0	1902	1652	2023.2	2356	1854	15
259	16	Pon	534	10.54583	5.06	11.3539	2.38	1.00534	19.5152	-24.26	61.463	2.7	76	621	1240.6	1900	1736	2116.5	****	1850	16
260	17	Wto	535	10.58549	5.28	11.3914	2.15	1.00506	20.4537	-22.18	62.072	3.7	84	622	1240.3	1857	1807	2206.9	102	1846	17
261	18	Śro	536	11.02514	5.49	11.4249	1.52	1.00479	21.3633	-19.10	62.585	4.7	91	624	1239.9	1855	1830	2254.1	214	1842	18
262	19	Czw	537	11.06480	6.11	11.4624	1.28	1.00451	22.2443	-15.14	63.001	5.7	96	626	1239.6	1852	1848	2338.5	327	1838	19
263	20	Pią	538	11.10445	6.32	11.4960	1.05	1.00423	23.1032	-10.44	63.323	6.7	99	627	1239.2	1850	1903	*****	440	1834	20
264	21	Sob	539	11.14411	6.53	11.5335	0.42	1.00395	23.5436	-5.52	63.551	7.7	100	629	1238.9	1848	1916	020.6	551	1830	21
265	22	Nie	540	11.18376	7.15	11.5710	0.18	1.00368	0.3739	-0.49	63.681	0.8	99	631	1238.5	1845	1927	101.2	700	1826	22
266	23	Pon	541	11.22342	7.36	12.0045	-0.05	1.00340	1.2027	4.15	63.706	1.8	97	633	1238.1	1843	1939	141.2	810	1822	23
267	24	Wto	542	11.26307	7.57	12.0421	-0.28	1.00312	2.0347	9.11	63.615	2.8	93	634	1237.8	1840	1952	221.4	919	1818	24
268	25	Śro	543	11.30273	8.18	12.0757	-0.52	1.00284	2.4826	13.47	63.394	3.8	87	636	1237.4	1838	2008	302.6	1029	1814	25
269	26	Czw	544	11.34238	8.39	12.1132	-1.15	1.00257	3.3506	17.55	63.031	4.8	80	638	1237.1	1835	2026	345.8	1141	1810	26
270	27	Pią	545	11.38204	8.59	12.1508	-1.38	1.00229	4.2422	21.21	62.520	5.8	72	639	1236.8	1833	2051	431.6	1253	1806	27
271	28	Sob	546	11.42170	9.19	12.1845	-2.02	1.00201	5.1633	23.53	61.860	6.8	63	641	1236.4	1831	2125	520.6	1403	1802	28
272	29	Nie	547	11.46135	9.39	12.2221	-2.25	1.00173	6.1135	25.18	61.065	7.8	53	643	1236.1	1828	2211	612.8	1508	1759	29
273	30	Pon	548	11.50101	9.59	12.2558	-2.48	1.00145	7.0852	25.25	60.165	0.7	43	645	1235.8	1826	2312	707.8	1603	1755	30

Fazy Księżyca [Dm, h.mm]: Nów 7, 5.10 1kw 13, 20.08 Pełn 21, 15.59 3kw 29, 19.03

WRZESIEŃ 2002 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE			MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0 ^h UT)		
1	3.43	21.47	8.43	20.01	10.33	20.26	5.13	19.30	2.49	18.34	23.37	16.10	19.09	4.51	18.27	3.13	14.10	23.55			
	10.694	8.27	12.300	-4.51	13.429	-12.16	10.281	11.91	8.605	19.00	5.831	22.14	21.925	-13.46	20.749	-17.99	16.981	-12.83	22.66562	1	
3	3.48	21.41	8.47	19.54	10.37	20.20	5.13	19.24	2.43	18.27	23.29	16.03	19.01	4.43	18.19	3.05	14.02	23.47			
	10.815	7.54	12.403	-5.51	13.534	-13.01	10.362	11.45	8.633	18.91	5.841	22.14	21.920	-13.49	20.746	-18.00	16.981	-12.85	22.79704	3	
5	3.54	21.34	8.50	19.47	10.40	20.13	5.13	19.18	2.38	18.20	23.22	15.55	18.53	4.34	18.11	2.57	13.54	23.39			
	10.935	6.80	12.495	-6.41	13.636	-13.85	10.443	10.99	8.661	18.81	5.850	22.14	21.915	-13.51	20.743	-18.02	16.982	-12.86	22.92846	5	
7	3.59	21.28	8.51	19.39	10.43	20.06	5.12	19.12	2.32	18.13	23.15	15.48	18.45	4.26	18.03	2.49	13.47	23.31			
	11.055	6.06	12.573	-7.21	13.736	-14.67	10.523	10.52	8.688	18.71	5.859	22.14	21.910	-13.54	20.740	-18.03	16.983	-12.88	23.05988	7	
9	4.03	21.22	8.50	19.31	10.46	19.60	5.12	19.07	2.27	18.06	23.07	15.41	18.37	4.18	17.55	2.40	13.39	23.23			
	11.175	5.31	12.635	-7.88	13.833	-15.46	10.603	10.04	8.715	18.61	5.867	22.14	21.905	-13.56	20.737	-18.04	16.983	-12.89	23.19129	9	
11	4.08	21.16	8.48	19.23	10.48	19.53	5.11	19.01	2.21	17.59	22.60	15.33	18.29	4.10	17.47	2.32	13.31	23.15			
	11.295	4.55	12.680	-8.40	13.927	-16.23	10.683	9.57	8.741	18.51	5.875	22.14	21.900	-13.58	20.735	-18.05	16.985	-12.91	23.32271	11	
13	4.13	21.10	8.44	19.15	10.50	19.46	5.11	18.55	2.15	17.52	22.52	15.26	18.21	4.01	17.39	2.24	13.23	23.08			
	11.415	3.78	12.704	-8.75	14.018	-16.97	10.762	9.09	8.768	18.42	5.883	22.14	21.896	-13.61	20.732	-18.06	16.986	-12.92	23.45413	13	
15	4.17	21.04	8.37	19.06	10.52	19.38	5.11	18.49	2.10	17.45	22.45	15.18	18.13	3.53	17.31	2.16	13.16	22.60			
	11.534	3.02	12.706	-8.89	14.106	-17.68	10.842	8.60	8.793	18.32	5.890	22.14	21.891	-13.63	20.730	-18.07	16.987	-12.94	23.58555	15	
17	4.22	20.58	8.27	18.58	10.54	19.31	5.10	18.43	2.04	17.38	22.38	15.11	18.05	3.45	17.23	2.08	13.08	22.52			
	11.654	2.25	12.683	-8.81	14.190	-18.37	10.921	8.12	8.819	18.23	5.896	22.14	21.887	-13.65	20.727	-18.08	16.988	-12.96	23.71697	17	
19	4.26	20.52	8.14	18.49	10.55	19.24	5.10	18.38	1.58	17.31	22.30	15.03	17.57	3.37	17.15	2.00	13.00	22.44			
	11.773	1.47	12.634	-8.46	14.270	-19.02	11.000	7.63	8.844	18.13	5.902	22.14	21.883	-13.68	20.725	-18.09	16.990	-12.97	23.84839	19	
21	4.30	20.47	7.58	18.40	10.56	19.16	5.09	18.32	1.52	17.24	22.22	14.56	17.49	3.28	17.07	1.52	12.53	22.36			
	11.893	0.70	12.559	-7.83	14.345	-19.64	11.079	7.13	8.869	18.04	5.908	22.13	21.879	-13.70	20.723	-18.10	16.992	-12.99	23.97980	21	
23	4.35	20.41	7.40	18.31	10.56	19.09	5.09	18.26	1.47	17.17	22.15	14.48	17.41	3.20	16.59	1.44	12.45	22.28			
	12.013	-0.08	12.462	-6.92	14.415	-20.22	11.157	6.64	8.893	17.94	5.913	22.13	21.875	-13.72	20.721	-18.10	16.994	-13.01	0.11122	23	
25	4.39	20.36	7.19	18.23	10.56	19.01	5.09	18.20	1.41	17.10	22.07	14.41	17.33	3.12	16.51	1.36	12.37	22.20			
	12.132	-0.86	12.347	-5.75	14.479	-20.76	11.236	6.14	8.917	17.85	5.917	22.13	21.871	-13.74	20.719	-18.11	16.996	-13.02	0.24264	25	
27	4.43	20.30	6.56	18.15	10.55	18.53	5.08	18.14	1.35	17.03	21.60	14.33	17.25	3.04	16.43	1.28	12.30	22.13			
	12.252	-1.64	12.225	-4.41	14.537	-21.26	11.314	5.64	8.941	17.76	5.921	22.13	21.867	-13.75	20.718	-18.12	16.998	-13.04	0.37406	27	
29	4.47	20.25	6.34	18.08	10.53	18.45	5.08	18.08	1.29	16.56	21.52	14.25	17.17	2.55	16.35	1.20	12.22	22.05			
	12.373	-2.42	12.108	-2.99	14.589	-21.71	11.393	5.14	8.964	17.67	5.925	22.13	21.863	-13.77	20.716	-18.12	17.000	-13.06	0.50548	29	

PAŹDZIERNIK 2002

Piwnice, CA UMK			← Dane na godz. 12 czasu strefowego (= 10 lub 11 ^b UT) →									 Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2452																		
274	1	Wto	549	11.54066	10.19	12.2935	-3.12	1.00118	8.0725	24.05	59.204	1.7	32	646	1235.4	1823	****	804.4	1646	1751	1
275	2	Śro	550	11.58032	10.38	12.3312	-3.35	1.00089	9.0606	21.18	58.246	2.7	22	648	1235.1	1821	027	901.3	1718	1747	2
276	3	Czw	551	12.01597	10.57	12.3650	-3.58	1.00061	10.0400	17.08	57.366	3.7	13	650	1234.8	1819	151	957.5	1743	1743	3
277	4	Pią	552	12.05563	11.15	12.4028	-4.21	1.00033	11.0044	11.50	56.646	4.7	6	652	1234.5	1816	321	1052.4	1803	1739	4
278	5	Sob	553	12.09528	11.33	12.4407	-4.44	1.00005	11.5624	5.42	56.161	5.7	2	654	1234.2	1814	452	1146.1	1820	1735	5
279	6	Nie	554	12.13494	11.51	12.4745	-5.08	0.99976	12.5136	-0.51	55.963	6.7	0	655	1233.9	1812	623	1239.2	1837	1731	6
280	7	Pon	555	12.17459	12.09	12.5124	-5.31	0.99947	13.4703	-7.21	56.075	0.9	1	657	1233.6	1809	756	1332.6	1853	1727	7
281	8	Wto	556	12.21425	12.26	12.5504	-5.53	0.99918	14.4330	-13.22	56.484	1.9	6	659	1233.3	1807	928	1427.3	1913	1723	8
282	9	Śro	557	12.25390	12.42	12.5844	-6.16	0.99889	15.4123	-18.28	57.142	2.9	13	701	1233.0	1804	1059	1523.5	1937	1719	9
283	10	Czw	558	12.29356	12.58	13.0224	-6.39	0.99860	16.4039	-22.20	57.979	3.9	21	702	1232.8	1802	1227	1621.2	2009	1715	10
284	11	Pią	559	12.33321	13.14	13.0605	-7.02	0.99831	17.4037	-24.45	58.915	4.9	31	704	1232.5	1800	1345	1719.5	2051	1711	11
285	12	Sob	560	12.37287	13.29	13.0947	-7.24	0.99802	18.4008	-25.37	59.872	5.9	41	706	1232.3	1758	1449	1817.0	2146	1707	12
286	13	Nie	561	12.41253	13.44	13.1328	-7.47	0.99773	19.3754	-25.02	60.784	0.2	52	708	1232.0	1755	1538	1912.2	2251	1703	13
287	14	Pon	562	12.45218	13.58	13.1711	-8.09	0.99744	20.3256	-23.08	61.602	1.2	62	710	1231.8	1753	1612	2004.1	****	1700	14
288	15	Wto	563	12.49184	14.12	13.2054	-8.31	0.99715	21.2447	-20.11	62.296	2.2	71	711	1231.5	1751	1638	2052.4	002	1656	15
289	16	Śro	564	12.53149	14.25	13.2437	-8.54	0.99686	22.1332	-16.23	62.850	3.2	80	713	1231.3	1748	1657	2137.5	116	1652	16
290	17	Czw	565	12.57115	14.38	13.2821	-9.16	0.99657	22.5939	-11.60	63.260	4.2	87	715	1231.1	1746	1712	2220.0	229	1648	17
291	18	Pią	566	13.01080	14.50	13.3205	-9.37	0.99628	23.4350	-7.11	63.532	5.2	93	717	1230.9	1744	1725	2300.7	340	1644	18
292	19	Sob	567	13.05046	15.01	13.3551	-9.59	0.99600	0.2652	-2.08	63.678	6.2	97	719	1230.7	1742	1736	2340.6	450	1640	19
293	20	Nie	568	13.09011	15.12	13.3936	-10.21	0.99572	1.0934	2.59	63.708	7.2	99	721	1230.5	1740	1748	*****	559	1636	20
294	21	Pon	569	13.12577	15.22	13.4323	-10.42	0.99544	1.5243	8.01	63.634	0.1	100	722	1230.4	1737	1800	020.6	709	1632	21
295	22	Wto	570	13.16542	15.32	13.4710	-11.03	0.99516	2.3704	12.46	63.462	1.1	99	724	1230.2	1735	1814	101.5	819	1628	22
296	23	Śro	571	13.20508	15.41	13.5057	-11.25	0.99489	3.2319	17.05	63.192	2.1	96	726	1230.1	1733	1831	144.1	931	1624	23
297	24	Czw	572	13.24473	15.49	13.5446	-11.45	0.99462	4.1159	20.44	62.823	3.1	91	728	1229.9	1731	1854	229.2	1044	1620	24
298	25	Pią	573	13.28439	15.56	13.5835	-12.06	0.99435	5.0321	23.32	62.351	4.1	85	730	1229.8	1729	1924	317.1	1155	1616	25
299	26	Sob	574	13.32405	16.03	14.0225	-12.27	0.99409	5.5717	25.15	61.774	5.1	78	732	1229.7	1727	2005	408.0	1302	1612	26
300	27	Nie	575	13.36370	16.09	14.0616	-12.47	0.99382	6.5313	25.43	61.095	6.1	69	734	1229.6	1725	2059	501.3	1359	1608	27
300	27	Nie	575	14.36469	16.09	14.0625	-12.48	0.99381	6.5534	25.43	61.064	6.2	68	634	1129.6	1625	1959	401.3	1259	1508	27
301	28	Pon	576	14.40434	16.14	14.1017	-13.08	0.99355	7.5236	24.46	60.292	7.2	58	636	1129.5	1623	2108	456.2	1345	1505	28
302	29	Wto	577	14.44400	16.18	14.1409	-13.28	0.99329	8.4938	22.25	59.455	0.2	48	637	1129.4	1621	2226	551.4	1420	1501	29
303	30	Śro	578	14.48365	16.22	14.1802	-13.48	0.99304	9.4552	18.46	58.597	1.2	37	639	1129.4	1619	2351	646.0	1446	1457	30
304	31	Czw	579	14.52331	16.25	14.2155	-14.08	0.99278	10.4101	13.57	57.773	2.2	26	641	1129.3	1617	****	739.3	1507	1453	31

Fazy Księżyca [Dm, h.mm]: Nów 6, 13.18 1kw 13, 7.33 Pełn 21, 9.20 Pełn 21, 8.20 3kw 29, 6.28

PAŹDZIERNIK 2002 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.51	20.20	6.13	18.01	10.51	18.37	5.07	18.02	1.23	16.49	21.44	14.18	17.09	2.47	16.28	1.12	12.14	21.57		
	12.493	-3.19	12.009	-1.62	14.633	-22.12	11.471	4.63	8.986	17.58	5.927	22.13	21.860	-13.79	20.715	-18.13	17.003	-13.07	0.63690	1
3	4.54	20.15	5.54	17.55	10.48	18.29	5.07	17.56	1.17	16.42	21.37	14.10	17.01	2.39	16.20	1.04	12.07	21.49		
	12.614	-3.97	11.938	-0.42	14.669	-22.47	11.549	4.13	9.008	17.49	5.930	22.13	21.857	-13.81	20.713	-18.14	17.005	-13.09	0.76832	3
5	4.58	20.10	5.39	17.50	10.44	18.20	5.06	17.50	1.11	16.35	21.29	14.02	16.53	2.31	16.12	0.56	11.59	21.41		
	12.735	-4.74	11.905	0.51	14.697	-22.77	11.627	3.62	9.030	17.41	5.932	22.12	21.854	-13.82	20.712	-18.14	17.008	-13.11	0.89974	5
7	5.02	20.05	5.29	17.46	10.39	18.12	5.06	17.44	1.05	16.28	21.21	13.54	16.45	2.23	16.04	0.48	11.52	21.34		
	12.857	-5.51	11.911	1.10	14.716	-23.01	11.705	3.11	9.051	17.32	5.933	22.12	21.851	-13.84	20.711	-18.15	17.011	-13.12	1.03115	7
9	5.06	20.00	5.23	17.42	10.33	18.03	5.05	17.39	0.59	16.20	21.13	13.47	16.38	2.15	15.56	0.40	11.44	21.26		
	12.979	-6.27	11.959	1.32	14.726	-23.18	11.783	2.60	9.072	17.24	5.934	22.12	21.848	-13.85	20.710	-18.15	17.014	-13.14	1.16257	9
11	5.09	19.55	5.20	17.39	10.26	17.55	5.05	17.33	0.53	16.13	21.06	13.39	16.30	2.07	15.48	0.32	11.36	21.18		
	13.101	-7.03	12.043	1.20	14.726	-23.28	11.861	2.09	9.092	17.16	5.934	22.12	21.845	-13.86	20.709	-18.15	17.017	-13.15	1.29399	11
13	5.13	19.51	5.22	17.36	10.17	17.46	5.04	17.27	0.47	16.06	20.58	13.31	16.22	1.59	15.40	0.24	11.29	21.10		
	13.225	-7.78	12.160	0.77	14.715	-23.30	11.939	1.58	9.112	17.08	5.934	22.12	21.843	-13.87	20.709	-18.15	17.020	-13.17	1.42541	13
15	5.17	19.46	5.26	17.33	10.08	17.37	5.04	17.21	0.40	15.59	20.50	13.23	16.14	1.51	15.32	0.16	11.21	21.02		
	13.348	-8.52	12.303	0.06	14.695	-23.24	12.017	1.07	9.131	17.00	5.933	22.11	21.841	-13.88	20.708	-18.16	17.023	-13.19	1.55683	15
17	5.20	19.42	5.33	17.30	9.57	17.29	5.03	17.15	0.34	15.52	20.42	13.15	16.06	1.43	15.24	0.09	11.14	20.55		
	13.472	-9.26	12.465	-0.86	14.664	-23.09	12.095	0.55	9.149	16.93	5.932	22.11	21.839	-13.89	20.708	-18.16	17.027	-13.20	1.68825	17
19	5.24	19.38	5.42	17.26	9.45	17.20	5.03	17.09	0.28	15.44	20.34	13.07	15.58	1.34	15.17	23.57	11.06	20.47		
	13.597	-9.99	12.642	-1.95	14.623	-22.85	12.172	0.04	9.167	16.86	5.930	22.11	21.837	-13.90	20.708	-18.16	17.030	-13.22	1.81967	19
21	5.27	19.33	5.51	17.23	9.32	17.12	5.02	17.03	0.21	15.37	20.26	12.59	15.50	1.26	15.09	23.49	10.59	20.39		
	13.723	-10.70	12.830	-3.15	14.573	-22.52	12.250	-0.47	9.184	16.79	5.928	22.11	21.835	-13.91	20.708	-18.16	17.034	-13.24	1.95108	21
23	5.31	19.29	6.02	17.20	9.17	17.04	5.02	16.57	0.15	15.30	20.18	12.51	15.42	1.19	15.01	23.41	10.51	20.31		
	13.849	-11.41	13.025	-4.44	14.516	-22.09	12.328	-0.98	9.201	16.72	5.925	22.11	21.834	-13.91	20.708	-18.16	17.038	-13.25	2.08250	23
25	5.34	19.25	6.13	17.17	9.02	16.56	5.01	16.51	0.09	15.22	20.10	12.43	15.34	1.11	14.53	23.33	10.44	20.24		
	13.976	-12.10	13.224	-5.78	14.452	-21.57	12.406	-1.49	9.217	16.66	5.921	22.11	21.833	-13.92	20.708	-18.16	17.042	-13.27	2.21392	25
27	5.38	19.22	6.25	17.14	8.45	16.48	5.01	16.45	0.02	15.15	20.02	12.35	15.26	1.03	14.45	23.25	10.36	20.16		
	14.104	-12.79	13.427	-7.15	14.384	-20.97	12.484	-2.01	9.232	16.59	5.918	22.10	21.832	-13.92	20.709	-18.16	17.046	-13.29	2.34535	27
27	4.38	18.22	5.25	16.14	7.45	15.48	4.01	15.45	22.58	14.15	19.02	11.35	14.26	0.03	13.45	22.25	9.36	19.16		
	14.107	-12.80	13.431	-7.17	14.382	-20.95	12.486	-2.02	9.233	16.59	5.917	22.10	21.832	-13.92	20.709	-18.16	17.046	-13.29	2.34535	27
29	4.41	18.18	5.37	16.11	7.28	15.41	4.01	15.39	22.51	14.08	18.54	11.27	14.18	23.51	13.37	22.18	9.29	19.08		
	14.236	-13.47	13.636	-8.55	14.311	-20.27	12.564	-2.53	9.247	16.53	5.913	22.10	21.831	-13.92	20.710	-18.16	17.050	-13.30	2.47677	29
31	4.44	18.15	5.49	16.08	7.11	15.33	4.00	15.34	22.45	14.00	18.46	11.18	14.10	23.43	13.29	22.10	9.21	19.01		
	14.365	-14.13	13.842	-9.91	14.239	-19.53	12.643	-3.03	9.261	16.48	5.908	22.10	21.830	-13.93	20.710	-18.15	17.054	-13.32	2.60819	31

LISTOPAD 2002

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2452																			
305	1	Pią	580	14.56296	16.27	14.2550	-14.27	0.99252	11.3514	8.14	57.052	3.2	16	643	1129.3	1615	118	831.5	1524	1449	1	
306	2	Sob	581	15.00262	16.28	14.2945	-14.46	0.99227	12.2908	1.55	56.507	4.2	9	645	1129.3	1613	247	923.3	1540	1445	2	
307	3	Nie	582	15.04228	16.28	14.3342	-15.05	0.99202	13.2333	-4.37	56.202	5.2	3	647	1129.3	1611	418	1015.5	1556	1441	3	
308	4	Pon	583	15.08193	16.28	14.3739	-15.23	0.99177	14.1920	-10.55	56.180	6.2	0	649	1129.3	1609	550	1109.2	1613	1437	4	
309	5	Wto	584	15.12159	16.27	14.4137	-15.42	0.99152	15.1709	-16.33	56.455	0.6	1	651	1129.3	1607	723	1205.1	1635	1433	5	
310	6	Śro	585	15.16124	16.24	14.4535	-15.60	0.99127	16.1708	-21.05	57.003	1.6	4	653	1129.3	1605	855	1303.5	1702	1429	6	
311	7	Czw	586	15.20090	16.21	14.4935	-16.18	0.99102	17.1843	-24.11	57.773	2.6	9	654	1129.4	1604	1022	1403.6	1740	1425	7	
312	8	Pią	587	15.24055	16.18	14.5335	-16.35	0.99077	18.2033	-25.39	58.689	3.6	17	656	1129.5	1602	1136	1503.8	1831	1421	8	
313	9	Sob	588	15.28021	16.13	14.5736	-16.53	0.99053	19.2056	-25.31	59.671	4.6	26	658	1129.5	1600	1233	1602.2	1934	1417	9	
314	10	Nie	589	15.31587	16.08	15.0138	-17.10	0.99029	20.1827	-23.56	60.639	5.6	36	700	1129.6	1559	1314	1657.1	2046	1413	10	
315	11	Pon	590	15.35552	16.01	15.0541	-17.26	0.99005	21.1219	-21.10	61.527	6.6	46	702	1129.7	1557	1343	1747.9	2201	1409	11	
316	12	Wto	591	15.39518	15.54	15.0945	-17.43	0.98981	22.0231	-17.29	62.284	0.6	56	704	1129.8	1555	1404	1834.8	2316	1406	12	
317	13	Śro	592	15.43483	15.46	15.1349	-17.59	0.98957	22.4933	-13.10	62.880	1.6	65	706	1130.0	1554	1420	1918.4	****	1402	13	
318	14	Czw	593	15.47449	15.37	15.1755	-18.14	0.98934	23.3413	-8.24	63.300	2.6	74	707	1130.1	1552	1434	1959.6	028	1358	14	
319	15	Pią	594	15.51414	15.28	15.2201	-18.30	0.98911	0.1723	-3.22	63.544	3.6	82	709	1130.3	1551	1445	2039.6	138	1354	15	
320	16	Sob	595	15.55380	15.17	15.2608	-18.45	0.98889	0.5958	1.46	63.623	4.6	89	711	1130.5	1549	1457	2119.4	248	1350	16	
321	17	Nie	596	15.59345	15.06	15.3016	-18.60	0.98867	1.4253	6.51	63.557	5.6	94	713	1130.6	1548	1509	2159.8	357	1346	17	
322	18	Pon	597	16.03311	14.54	15.3424	-19.14	0.98846	2.2657	11.43	63.371	6.6	98	715	1130.8	1546	1522	2241.9	507	1342	18	
323	19	Wto	598	16.07277	14.41	15.3834	-19.28	0.98825	3.1257	16.11	63.086	7.6	100	716	1131.1	1545	1538	2326.4	619	1338	19	
324	20	Śro	599	16.11242	14.28	15.4244	-19.42	0.98804	4.0125	20.03	62.725	0.4	100	718	1131.3	1544	1558	*****	733	1334	20	
325	21	Czw	600	16.15207	14.13	15.4655	-19.56	0.98784	4.5241	23.05	62.303	1.4	98	720	1131.5	1543	1625	013.8	846	1330	21	
326	22	Pią	601	16.19173	13.58	15.5107	-20.09	0.98765	5.4637	25.04	61.829	2.4	95	722	1131.8	1541	1703	104.3	955	1326	22	
327	23	Sob	602	16.23139	13.41	15.5520	-20.21	0.98745	6.4232	25.49	61.309	3.4	89	723	1132.1	1540	1753	157.4	1056	1322	23	
328	24	Nie	603	16.27105	13.25	15.5933	-20.34	0.98727	7.3924	25.11	60.747	4.4	82	725	1132.3	1539	1857	252.1	1146	1318	24	
329	25	Pon	604	16.31070	13.07	16.0347	-20.45	0.98709	8.3602	23.12	60.145	5.4	73	727	1132.6	1538	2012	347.0	1224	1314	25	
330	26	Wto	605	16.35036	12.48	16.0802	-20.57	0.98691	9.3133	19.55	59.512	6.4	63	728	1132.9	1537	2133	440.9	1252	1310	26	
331	27	Śro	606	16.39001	12.29	16.1218	-21.08	0.98674	10.2534	15.30	58.866	7.4	52	730	1133.3	1536	2257	533.3	1313	1307	27	
332	28	Czw	607	16.42567	12.09	16.1635	-21.19	0.98657	11.1814	10.12	58.237	0.8	41	732	1133.6	1535	****	624.0	1331	1303	28	
333	29	Pią	608	16.46532	11.48	16.2052	-21.29	0.98641	12.1012	4.15	57.665	1.8	30	733	1133.9	1534	023	713.8	1346	1259	29	
334	30	Sob	609	16.50498	11.27	16.2510	-21.39	0.98624	13.0221	-2.02	57.200	2.8	20	735	1134.3	1533	149	803.6	1401	1255	30	

Fazy Księżyca [Dm, h.mm]: Nów 4, 21.34 1kw 11, 21.52 Pełn 20, 2.34 3kw 27, 16.46

LISTOPAD 2002 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.46	18.13	5.55	16.06	7.03	15.30	3.60	15.31	22.41	13.57	18.41	11.14	14.06	23.39	13.26	22.06	9.17	18.57		
	14.431	-14.45	13.946	-10.58	14.203	-19.14	12.682	-3.29	9.268	16.45	5.905	22.10	21.830	-13.93	20.711	-18.15	17.056	-13.32	2.67389	1
3	4.49	18.09	6.08	16.03	6.45	15.23	3.60	15.25	22.35	13.49	18.33	11.06	13.59	23.31	13.18	21.58	9.10	18.49		
	14.562	-15.08	14.153	-11.91	14.134	-18.33	12.760	-3.80	9.281	16.40	5.900	22.10	21.830	-13.93	20.712	-18.15	17.060	-13.34	2.80531	3
5	4.52	18.06	6.20	16.00	6.28	15.17	3.59	15.19	22.28	13.42	18.25	10.58	13.51	23.23	13.10	21.50	9.02	18.41		
	14.693	-15.70	14.361	-13.21	14.069	-17.51	12.839	-4.30	9.294	16.35	5.894	22.10	21.830	-13.93	20.713	-18.14	17.065	-13.35	2.93673	5
7	4.56	18.03	6.32	15.58	6.12	15.11	3.59	15.13	22.21	13.34	18.17	10.50	13.43	23.15	13.02	21.43	8.55	18.34		
	14.826	-16.29	14.570	-14.46	14.010	-16.68	12.917	-4.80	9.305	16.30	5.887	22.09	21.830	-13.92	20.714	-18.14	17.069	-13.37	3.06815	7
9	4.59	18.00	6.44	15.55	5.56	15.05	3.58	15.07	22.14	13.27	18.08	10.41	13.35	23.08	12.54	21.35	8.47	18.26		
	14.960	-16.88	14.779	-15.66	13.958	-15.87	12.996	-5.30	9.316	16.26	5.880	22.09	21.831	-13.92	20.716	-18.13	17.074	-13.38	3.19957	9
11	5.02	17.58	6.55	15.53	5.41	14.59	3.58	15.01	22.07	13.19	18.00	10.33	13.27	22.60	12.46	21.27	8.40	18.18		
	15.095	-17.44	14.989	-16.81	13.915	-15.10	13.075	-5.80	9.326	16.22	5.872	22.09	21.831	-13.91	20.717	-18.13	17.078	-13.40	3.33100	11
13	5.05	17.55	7.07	15.51	5.26	14.53	3.57	14.56	21.60	13.12	17.52	10.25	13.19	22.52	12.39	21.19	8.32	18.11		
	15.230	-17.98	15.201	-17.91	13.882	-14.37	13.155	-6.30	9.335	16.19	5.865	22.09	21.832	-13.91	20.719	-18.12	17.083	-13.41	3.46242	13
15	5.08	17.53	7.19	15.49	5.13	14.48	3.57	14.50	21.53	13.04	17.44	10.16	13.11	22.44	12.31	21.12	8.25	18.03		
	15.367	-18.50	15.413	-18.95	13.858	-13.70	13.234	-6.79	9.344	16.15	5.856	22.09	21.833	-13.90	20.721	-18.12	17.088	-13.43	3.59383	15
17	5.11	17.51	7.30	15.47	5.01	14.43	3.56	14.44	21.46	12.57	17.35	10.08	13.04	22.36	12.23	21.04	8.17	17.55		
	15.504	-19.00	15.627	-19.92	13.844	-13.10	13.313	-7.28	9.351	16.13	5.847	22.09	21.835	-13.89	20.723	-18.11	17.092	-13.44	3.72525	17
19	5.14	17.48	7.41	15.46	4.50	14.38	3.56	14.38	21.38	12.49	17.27	9.59	12.56	22.29	12.15	20.56	8.10	17.48		
	15.643	-19.47	15.842	-20.83	13.841	-12.57	13.393	-7.77	9.358	16.10	5.838	22.08	21.836	-13.88	20.725	-18.10	17.097	-13.45	3.85667	19
21	5.17	17.47	7.52	15.45	4.40	14.33	3.56	14.32	21.31	12.41	17.18	9.51	12.48	22.21	12.08	20.49	8.02	17.40		
	15.782	-19.93	16.059	-21.67	13.847	-12.12	13.473	-8.25	9.365	16.08	5.829	22.08	21.838	-13.87	20.728	-18.09	17.102	-13.47	3.98809	21
23	5.20	17.45	8.03	15.45	4.31	14.28	3.55	14.27	21.23	12.34	17.10	9.42	12.40	22.13	11.60	20.41	7.55	17.32		
	15.922	-20.35	16.277	-22.44	13.864	-11.75	13.553	-8.73	9.370	16.06	5.819	22.08	21.840	-13.86	20.730	-18.08	17.107	-13.48	4.11952	23
25	5.22	17.43	8.14	15.45	4.23	14.24	3.55	14.21	21.16	12.26	17.01	9.34	12.32	22.06	11.52	20.33	7.47	17.25		
	16.063	-20.76	16.497	-23.13	13.889	-11.46	13.634	-9.21	9.374	16.05	5.809	22.08	21.842	-13.85	20.733	-18.07	17.112	-13.49	4.25094	25
27	5.25	17.42	8.24	15.46	4.16	14.19	3.54	14.15	21.08	12.18	16.53	9.25	12.25	21.58	11.44	20.26	7.40	17.17		
	16.205	-21.13	16.719	-23.75	13.924	-11.24	13.714	-9.68	9.378	16.04	5.799	22.08	21.845	-13.84	20.735	-18.06	17.117	-13.50	4.38236	27
29	5.28	17.41	8.33	15.47	4.10	14.15	3.54	14.10	21.01	12.11	16.45	9.17	12.17	21.50	11.36	20.18	7.32	17.10		
	16.348	-21.49	16.942	-24.29	13.967	-11.10	13.795	-10.15	9.381	16.04	5.788	22.07	21.847	-13.82	20.738	-18.05	17.122	-13.52	4.51378	29

GRUDZIEŃ 2002

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2452																			
335	1	Nie	610	16.54463	11.05	16.2929	-21.49	0.98609	13.5544	-8.18	56.898	3.8	11	736	1134.7	1533	317	854.5	1417	1251	1	
336	2	Pon	611	16.58429	10.42	16.3348	-21.58	0.98593	14.5116	-14.09	56.803	4.8	5	738	1135.0	1532	447	947.7	1435	1247	2	
337	3	Wto	612	17.02394	10.19	16.3808	-22.06	0.98578	15.4933	-19.11	56.946	5.8	1	739	1135.4	1531	618	1044.0	1458	1243	3	
338	4	Śro	613	17.06360	9.55	16.4229	-22.15	0.98563	16.5028	-22.58	57.333	0.1	0	741	1135.8	1531	749	1143.3	1530	1239	4	
339	5	Czw	614	17.10326	9.30	16.4650	-22.22	0.98548	17.5302	-25.13	57.939	1.1	2	742	1136.2	1530	911	1244.3	1614	1235	5	
340	6	Pią	615	17.14291	9.05	16.5111	-22.30	0.98534	18.5527	-25.47	58.717	2.1	6	743	1136.7	1530	1019	1345.2	1713	1231	6	
341	7	Sob	616	17.18257	8.39	16.5534	-22.37	0.98520	19.5547	-24.45	59.600	3.1	12	745	1137.1	1529	1109	1443.6	1823	1227	7	
342	8	Nie	617	17.22223	8.13	16.5956	-22.43	0.98506	20.5237	-22.21	60.513	4.1	20	746	1137.5	1529	1144	1537.9	1940	1223	8	
343	9	Pon	618	17.26188	7.46	17.0419	-22.49	0.98493	21.4524	-18.53	61.385	5.1	29	747	1138.0	1529	1208	1627.8	2057	1219	9	
344	10	Wto	619	17.30154	7.19	17.0843	-22.55	0.98480	22.3426	-14.40	62.153	6.1	38	748	1138.4	1528	1227	1713.6	2212	1215	10	
345	11	Śro	620	17.34119	6.52	17.1307	-23.00	0.98468	23.2024	-9.57	62.769	7.1	48	749	1138.9	1528	1241	1756.2	2324	1212	11	
346	12	Czw	621	17.38085	6.24	17.1731	-23.05	0.98456	0.0417	-4.56	63.202	0.8	58	750	1139.3	1528	1254	1836.9	****	1208	12	
347	13	Pią	622	17.42051	5.56	17.2156	-23.09	0.98444	0.4704	0.12	63.437	1.8	67	751	1139.8	1528	1305	1916.7	034	1204	13	
348	14	Sob	623	17.46016	5.28	17.2621	-23.13	0.98433	1.2945	5.19	63.477	2.8	75	752	1140.3	1528	1316	1956.7	143	1200	14	
349	15	Nie	624	17.49582	4.59	17.3046	-23.16	0.98423	2.1318	10.15	63.337	3.8	83	753	1140.8	1528	1329	2038.0	253	1156	15	
350	16	Pon	625	17.53547	4.30	17.3512	-23.19	0.98413	2.5835	14.52	63.045	4.8	90	754	1141.2	1528	1344	2121.4	404	1152	16	
351	17	Wto	626	17.57513	4.01	17.3937	-23.21	0.98403	3.4622	18.57	62.635	5.8	95	755	1141.7	1529	1402	2207.9	517	1148	17	
352	18	Śro	627	18.01478	3.32	17.4403	-23.23	0.98395	4.3707	22.16	62.144	6.8	98	756	1142.2	1529	1427	2257.7	631	1144	18	
353	19	Czw	628	18.05444	3.02	17.4829	-23.25	0.98387	5.3054	24.36	61.609	7.8	100	756	1142.7	1529	1501	2350.8	743	1140	19	
354	20	Pią	629	18.09410	2.33	17.5256	-23.26	0.98379	6.2711	25.43	61.062	0.7	100	757	1143.2	1530	1547	*****	848	1136	20	
355	21	Sob	630	18.13375	2.03	17.5722	-23.26	0.98372	7.2451	25.27	60.528	1.7	97	757	1143.7	1530	1648	046.0	943	1132	21	
356	22	Nie	631	18.17341	1.33	18.0148	-23.26	0.98366	8.2230	23.46	60.021	2.7	92	758	1144.2	1530	1801	142.0	1025	1128	22	
357	23	Pon	632	18.21306	1.03	18.0614	-23.26	0.98360	9.1856	20.43	59.550	3.7	86	758	1144.7	1531	1921	237.1	1056	1124	23	
358	24	Wto	633	18.25272	0.33	18.1041	-23.25	0.98355	10.1329	16.32	59.117	4.7	77	759	1145.2	1532	2045	330.4	1120	1120	24	
359	25	Śro	634	18.29238	0.04	18.1507	-23.24	0.98351	11.0607	11.26	58.722	5.7	67	759	1145.7	1532	2209	421.4	1138	1116	25	
360	26	Czw	635	18.33203	-0.26	18.1933	-23.22	0.98347	11.5723	5.41	58.370	6.7	56	759	1146.2	1533	2333	510.7	1153	1113	26	
361	27	Pią	636	18.37169	-0.56	18.2360	-23.20	0.98344	12.4809	-0.23	58.070	0.4	45	800	1146.7	1534	****	559.1	1208	1109	27	
362	28	Sob	637	18.41134	-1.25	18.2826	-23.17	0.98341	13.3930	-6.30	57.840	1.4	34	800	1147.2	1535	057	647.9	1223	1105	28	
363	29	Nie	638	18.45100	-1.54	18.3251	-23.13	0.98338	14.3227	-12.20	57.706	2.4	23	800	1147.7	1536	223	738.2	1239	1101	29	
364	30	Pon	639	18.49065	-2.24	18.3717	-23.10	0.98336	15.2755	-17.30	57.695	3.4	14	800	1148.1	1537	351	831.2	1259	1057	30	
365	31	Wto	640	18.53031	-2.52	18.4143	-23.06	0.98335	16.2616	-21.41	57.832	4.4	7	800	1148.6	1538	520	927.3	1326	1053	31	

Fazy Księżyca [Dm, h.mm]: Nów 4, 8.34 1kw 11, 16.48 Pełn 19, 20.10 3kw 27, 1.31

GRUDZIEŃ 2002 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	5.30	17.40	8.42	15.49	4.04	14.10	3.53	14.04	20.53	12.03	16.36	9.08	12.09	21.43	11.29	20.10	7.25	17.02		
	16.491	-21.81	17.166	-24.74	14.018	-11.03	13.877	-10.61	9.383	16.03	5.777	22.07	21.850	-13.80	20.741	-18.04	17.127	-13.53	4.64519	1
3	5.32	17.39	8.51	15.52	3.60	14.06	3.53	13.59	20.45	11.55	16.27	8.60	12.01	21.35	11.21	20.03	7.17	16.54		
	16.636	-22.11	17.392	-25.11	14.076	-11.02	13.958	-11.07	9.384	16.04	5.766	22.07	21.853	-13.79	20.744	-18.03	17.132	-13.54	4.77662	3
5	5.35	17.39	8.59	15.55	3.56	14.02	3.53	13.53	20.37	11.47	16.19	8.51	11.53	21.28	11.13	19.55	7.10	16.47		
	16.780	-22.37	17.617	-25.38	14.142	-11.07	14.040	-11.52	9.384	16.04	5.755	22.07	21.856	-13.77	20.748	-18.02	17.137	-13.55	4.90804	5
7	5.37	17.38	9.06	15.59	3.53	13.58	3.52	13.48	20.29	11.40	16.10	8.43	11.46	21.20	11.05	19.48	7.02	16.39		
	16.926	-22.61	17.844	-25.57	14.213	-11.17	14.122	-11.97	9.383	16.06	5.744	22.07	21.860	-13.75	20.751	-18.00	17.143	-13.56	5.03946	7
9	5.39	17.38	9.12	16.04	3.51	13.53	3.52	13.42	20.21	11.32	16.02	8.34	11.38	21.13	10.58	19.40	6.55	16.31		
	17.072	-22.82	18.069	-25.66	14.291	-11.33	14.204	-12.41	9.382	16.07	5.732	22.06	21.864	-13.73	20.755	-17.99	17.148	-13.57	5.17089	9
11	5.41	17.38	9.18	16.10	3.49	13.49	3.52	13.37	20.13	11.24	15.53	8.26	11.30	21.05	10.50	19.33	6.47	16.24		
	17.219	-23.00	18.294	-25.65	14.374	-11.53	14.287	-12.85	9.379	16.09	5.720	22.06	21.867	-13.71	20.758	-17.98	17.153	-13.58	5.30231	11
13	5.42	17.38	9.23	16.16	3.48	13.45	3.51	13.31	20.05	11.16	15.45	8.17	11.22	20.58	10.42	19.25	6.40	16.16		
	17.366	-23.15	18.516	-25.54	14.462	-11.77	14.370	-13.28	9.376	16.11	5.709	22.06	21.871	-13.69	20.762	-17.96	17.158	-13.59	5.43372	13
15	5.44	17.38	9.26	16.23	3.47	13.42	3.51	13.26	19.57	11.08	15.36	8.08	11.15	20.50	10.35	19.17	6.32	16.09		
	17.513	-23.27	18.734	-25.34	14.555	-12.05	14.453	-13.71	9.372	16.14	5.697	22.06	21.876	-13.66	20.766	-17.95	17.163	-13.60	5.56514	15
17	5.46	17.39	9.28	16.30	3.47	13.38	3.50	13.20	19.48	10.60	15.28	7.60	11.07	20.43	10.27	19.10	6.25	16.01		
	17.660	-23.36	18.947	-25.04	14.653	-12.37	14.537	-14.13	9.367	16.17	5.685	22.06	21.880	-13.64	20.770	-17.93	17.168	-13.60	5.69656	17
19	5.47	17.40	9.30	16.38	3.47	13.34	3.50	13.15	19.40	10.52	15.19	7.51	10.59	20.35	10.19	19.02	6.17	15.53		
	17.808	-23.41	19.152	-24.64	14.755	-12.71	14.621	-14.54	9.361	16.21	5.673	22.05	21.885	-13.61	20.774	-17.92	17.173	-13.61	5.82799	19
21	5.48	17.40	9.30	16.45	3.48	13.30	3.50	13.10	19.31	10.44	15.11	7.43	10.51	20.28	10.11	18.55	6.10	15.46		
	17.956	-23.44	19.348	-24.16	14.861	-13.07	14.705	-14.95	9.354	16.25	5.661	22.05	21.889	-13.59	20.778	-17.90	17.179	-13.62	5.95941	21
23	5.49	17.41	9.28	16.53	3.49	13.27	3.49	13.05	19.23	10.36	15.02	7.34	10.44	20.20	10.04	18.47	6.02	15.38		
	18.104	-23.43	19.529	-23.59	14.971	-13.46	14.790	-15.35	9.347	16.29	5.649	22.05	21.894	-13.56	20.782	-17.89	17.184	-13.63	6.09084	23
25	5.50	17.43	9.25	16.59	3.50	13.23	3.49	12.59	19.14	10.28	14.53	7.26	10.36	20.13	9.56	18.40	5.55	15.31		
	18.252	-23.39	19.692	-22.96	15.085	-13.86	14.875	-15.74	9.338	16.34	5.638	22.05	21.899	-13.53	20.786	-17.87	17.189	-13.63	6.22226	25
27	5.50	17.44	9.21	17.05	3.52	13.20	3.48	12.54	19.05	10.20	14.45	7.17	10.28	20.06	9.48	18.32	5.47	15.23		
	18.400	-23.33	19.831	-22.28	15.202	-14.27	14.960	-16.12	9.329	16.39	5.626	22.04	21.905	-13.51	20.791	-17.85	17.194	-13.64	6.35367	27
29	5.51	17.46	9.15	17.08	3.54	13.17	3.48	12.49	18.57	10.12	14.36	7.08	10.21	19.58	9.41	18.25	5.40	15.15		
	18.548	-23.22	19.939	-21.59	15.323	-14.70	15.045	-16.50	9.319	16.44	5.615	22.04	21.910	-13.48	20.795	-17.84	17.199	-13.65	6.48509	29
31	5.51	17.47	9.06	17.10	3.56	13.14	3.48	12.44	18.48	10.03	14.28	6.60	10.13	19.51	9.33	18.17	5.32	15.08		
	18.695	-23.09	20.010	-20.90	15.446	-15.13	15.131	-16.87	9.309	16.49	5.603	22.04	21.916	-13.45	20.800	-17.82	17.203	-13.65	6.61651	31

Święta państwowe i kościelne w Polsce oraz inne ważniejsze dni w roku 2002

Nowy Rok	Wto	1 styczeń	Trójcy Najświętszej	Nie	26 maj
Najświętszej Maryi Panny Rodzicielki	Wto	1 styczeń	Dzień Matki	Nie	26 maj
Objawienia Pańskiego (Trzech Króli)	Nie	6 styczeń	Boże Ciało	Czw	30 maj
Juliański Nowy Rok	Pon	14 styczeń	Dzień Dziecka	Sob	1 czerwiec
Dzień Babci	Pon	21 styczeń	Dzień Dzięczynienia	Nie	2 czerwiec
Dzień Dziadka	Wto	22 styczeń	Najświętszego Serca Pana Jezusa	Pią	7 czerwiec
Ofiarowania Pańskiego	Sob	2 luty	Dzień Ojca	Nie	23 czerwiec
Matki Boskiej Gromnicznej	Sob	2 luty	Noc Świętojańska	Nie	23 czerwiec
Tłusty czwartek	Czw	7 luty	Św. Piotra i Pawła	Sob	29 czerwiec
Środa Popielcowa	Śro	13 luty	Wniebowzięcia N.M.P.	Czw	15 sierpień
Walentynki	Czw	14 luty	Święto Wojska Polskiego	Czw	15 sierpień
Święto UMK	Wto	19 luty	Dzień Solidarności i Wolności	Sob	31 sierpień
Dzień Kobiet	Pią	8 marzec	Dzień Programisty	Pią	13 wrzesień
Niedziela Palmowa	Nie	24 marzec	Dożynki – Święto Plonów	Pon	23 wrzesień
Narodowy Dzień Życia	Nie	24 marzec	Dzień Papieski	Nie	13 październik
Niedziela Wielkanocna	Nie	31 marzec	Dzień Edukacji Narodowej	Pon	14 październik
Niedziela Miłosierdzia Bożego	Nie	7 kwiecień	Dzień Papieża Jana Pawła II	Śro	16 październik
Święto Pracy	Śro	1 maj	Wszystkich Świętych	Pią	1 listopad
Dzień Flagi Rzeczypospolitej Polskiej	Czw	2 maj	Zaduszki	Sob	2 listopad
Najświętsza Maryja Królowa Polski	Pią	3 maj	Święto Niepodległości	Pon	11 listopad
Święto Konstytucji 3 Maja	Pią	3 maj	Pierwsza niedziela Adventu	Nie	1 grudzień
Wniebowstąpienia Pańskiego	Czw	9 maj	Niepokalane Poczęcie N.M.P.	Nie	8 grudzień
Dzień Polskiej Niezapominajki	Śro	15 maj	Boże Narodzenie	Śro	25 grudzień
Zesłania Ducha Świętego	Nie	19 maj	Sylwester	Wto	31 grudzień

Kalendarz astronomiczny 2003

PIWNICE, CA UMK

Współrzędne geograficzne: 18.5641°E 53.0955°N, Nr strefy czasowej (> 0 , gdy na wschód) = 1 (CSE)

Kalendarz jest gregoriańskim i jest oparty na efemerydach Układu Słonecznego obliczanych z dokładnością 1' (Słońce 2", Księżyc 10", Pluton 15'). Czas gwiazdowy ma dokładność około 0.1 s. Wschody i zachody obliczono z uwzględnieniem horyzontalnej refrakcji astronomicznej (34'), rozciągłości Słońca lub Księżyca i paralaksy horyzontalnej Księżyca. Dla dat odległych o więcej niż ok. 300 lat od roku 1950 dokładności położenia planet są gorsze niż 1'!
(Kalendarz ten opracowano [KMB] w Katedrze Radioastronomii CA UMK, Toruń—Piwnice. Oblicz. dnia 7.10.2010 r.)

Data Wielkanocy: **2003 KWIECIEŃ 20**

Dla całego roku przyjęto: TDT – UT = 65 s

Pory roku [miesiąc dzień, godz. mm] (czas zimowy): Wiosna **III 21, 2.00**, Lato **VI 21, 20.11**, Jesień **IX 23, 11.47**, Zima **XII 22, 8.04**

Dane w czasie letnim odróżniono kolorem brązowym; czas ten obowiązuje **od 30 marca do 26 października 2003 r.**

Oznaczenia:

Dr — dzień 2003 roku (1 stycznia Dr = 1)

Dm — dzień miesiąca

Dt — dzień tygodnia

JD — data juliańska modulo 1000 o 12^h UT

(po nagłówku: Entier(JD/1000) dla Dm = 1)

ST — prawdziwy czas gwiazdowy

$\Delta\alpha$ — różnica czasu (czas słoneczny prawdziwy minus średni)

α — rektascensja (Słońca lub Księżyca)

δ — deklinacja (Słońca lub Księżyca)

R — odległość (Słońca lub Księżyca)

j astr — jednostka astronomiczna

ρ_{\oplus} — promień Ziemi

Faza \leftarrow dni po kwadrze i % oświetlonej części tarczy Księżyca

Wsch — wschód (Słońca, Księżyca lub planety)

Gór — górowanie czyli tranzyt (Gal. = centrum Galaktyki)

Zach — zachód (Słońca, Księżyca lub planety)

STYCZEŃ 2003

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°/′	j astr	h.mmss	°/′	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2452																					
1	1	Śro	641	18.56596	-3.21	18.4608	-23.01	0.98334	17.2707	-24.30	58.134	5.4	2	800	1149.1	1539	644	1026.4	1403	1049	1
2	2	Czw	642	19.00562	-3.49	18.5033	-22.56	0.98333	18.2912	-25.44	58.599	6.4	0	800	1149.6	1540	759	1126.9	1454	1045	2
3	3	Pią	643	19.04528	-4.17	18.5457	-22.50	0.98332	19.3034	-25.20	59.208	0.6	0	759	1150.0	1541	857	1226.7	1559	1041	3
4	4	Sob	644	19.08493	-4.45	18.5921	-22.44	0.98332	20.2926	-23.26	59.923	1.6	3	759	1150.5	1542	939	1323.7	1715	1037	4
5	5	Nie	645	19.12459	-5.12	19.0345	-22.38	0.98333	21.2438	-20.18	60.691	2.6	8	759	1150.9	1543	1009	1416.5	1833	1033	5
6	6	Pon	646	19.16425	-5.39	19.0808	-22.31	0.98333	22.1556	-16.15	61.453	3.6	14	758	1151.4	1545	1030	1505.1	1951	1029	6
7	7	Wto	647	19.20390	-6.05	19.1231	-22.24	0.98334	23.0345	-11.36	62.150	4.6	22	758	1151.8	1546	1047	1549.8	2105	1025	7
8	8	Śro	648	19.24356	-6.31	19.1654	-22.16	0.98336	23.4855	-6.36	62.726	5.6	31	757	1152.3	1547	1100	1631.9	2217	1021	8
9	9	Czw	649	19.28321	-6.56	19.2115	-22.08	0.98338	0.3223	-1.26	63.140	6.6	40	757	1152.7	1549	1112	1712.3	2327	1018	9
10	10	Pią	650	19.32287	-7.21	19.2537	-21.59	0.98340	1.1511	3.43	63.361	7.6	49	756	1153.1	1550	1123	1752.2	****	1014	10
11	11	Sob	651	19.36252	-7.45	19.2957	-21.50	0.98343	1.5819	8.44	63.376	0.9	58	756	1153.5	1552	1135	1832.8	037	1010	11
12	12	Nie	652	19.40218	-8.09	19.3417	-21.40	0.98347	2.4244	13.27	63.188	1.9	68	755	1153.9	1553	1149	1915.0	147	1006	12
13	13	Pon	653	19.44183	-8.31	19.3837	-21.30	0.98351	3.2920	17.42	62.817	2.9	76	754	1154.3	1555	1205	1959.9	259	1002	13
14	14	Wto	654	19.48149	-8.54	19.4256	-21.20	0.98356	4.1848	21.17	62.293	3.9	84	753	1154.6	1556	1227	2048.1	412	958	14
15	15	Śro	655	19.52115	-9.15	19.4714	-21.09	0.98361	5.1130	23.58	61.663	4.9	90	752	1155.0	1558	1256	2139.8	525	954	15
16	16	Czw	656	19.56080	-9.36	19.5131	-20.58	0.98367	6.0714	25.30	60.975	5.9	96	751	1155.3	1600	1338	2234.7	634	950	16
17	17	Pią	657	20.00046	-9.56	19.5548	-20.47	0.98373	7.0510	25.42	60.283	6.9	99	750	1155.7	1601	1433	2331.4	734	946	17
18	18	Sob	658	20.04012	-10.16	20.0004	-20.35	0.98380	8.0356	24.25	59.636	0.0	100	749	1156.0	1603	1544	*****	822	942	18
19	19	Nie	659	20.07577	-10.35	20.0419	-20.22	0.98388	9.0203	21.42	59.075	1.0	99	748	1156.3	1605	1704	028.3	857	938	19
20	20	Pon	660	20.11543	-10.53	20.0834	-20.10	0.98396	9.5827	17.41	58.626	2.0	95	747	1156.6	1607	1829	123.6	924	934	20
21	21	Wto	661	20.15508	-11.10	20.1248	-19.56	0.98405	10.5244	12.39	58.301	3.0	89	746	1156.9	1608	1955	216.8	944	930	21
22	22	Śro	662	20.19474	-11.27	20.1701	-19.43	0.98415	11.4511	6.55	58.098	4.0	81	745	1157.2	1610	2120	307.7	1000	926	22
23	23	Czw	663	20.23439	-11.42	20.2113	-19.29	0.98425	12.3629	0.49	58.005	5.0	71	744	1157.5	1612	2245	357.0	1015	922	23
24	24	Pią	664	20.27405	-11.57	20.2525	-19.15	0.98436	13.2738	-5.19	58.006	6.0	60	742	1157.7	1614	****	445.7	1030	919	24
25	25	Sob	665	20.31370	-12.12	20.2936	-19.00	0.98447	14.1941	-11.11	58.087	0.1	49	741	1157.9	1616	010	535.1	1045	915	25
26	26	Nie	666	20.35336	-12.25	20.3346	-18.45	0.98459	15.1333	-16.27	58.236	1.1	38	739	1158.2	1617	136	626.2	1103	911	26
27	27	Pon	667	20.39301	-12.38	20.3755	-18.30	0.98471	16.0949	-20.48	58.453	2.1	27	738	1158.4	1619	303	720.0	1127	907	27
28	28	Wto	668	20.43267	-12.50	20.4204	-18.15	0.98483	17.0830	-23.55	58.739	3.1	18	737	1158.6	1621	427	816.4	1159	903	28
29	29	Śro	669	20.47233	-13.01	20.4611	-17.59	0.98496	18.0849	-25.35	59.099	4.1	10	735	1158.8	1623	544	915.0	1243	859	29
30	30	Czw	670	20.51198	-13.12	20.5018	-17.42	0.98509	19.0918	-25.41	59.537	5.1	5	733	1158.9	1625	647	1013.9	1342	855	30
31	31	Pią	671	20.55164	-13.21	20.5425	-17.26	0.98523	20.0817	-24.16	60.049	6.1	1	732	1159.1	1627	735	1111.2	1453	851	31

Fazy Księżyca [Dm, h.mm]: Nów 2, 21.23 1kw 10, 14.15 Pełn 18, 11.48 3kw 25, 9.33

STYCZEŃ 2003 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	5.51	17.48	9.01	17.09	3.57	13.12	3.47	12.42	18.43	9.59	14.24	6.56	10.09	19.47	9.29	18.14	5.28	15.04		
	18.769	-23.02	20.028	-20.58	15.509	-15.35	15.175	-17.05	9.303	16.52	5.598	22.04	21.918	-13.43	20.802	-17.81	17.206	-13.65	6.68223	1
3	5.51	17.50	8.49	17.05	3.59	13.09	3.47	12.37	18.34	9.51	14.15	6.47	10.01	19.40	9.21	18.06	5.21	14.56		
	18.916	-22.84	20.028	-19.98	15.637	-15.78	15.261	-17.41	9.291	16.59	5.587	22.04	21.924	-13.40	20.807	-17.79	17.211	-13.66	6.81365	3
5	5.51	17.52	8.35	16.57	4.02	13.07	3.47	12.32	18.25	9.43	14.07	6.39	9.54	19.33	9.14	17.59	5.13	14.49		
	19.063	-22.63	19.973	-19.49	15.768	-16.22	15.348	-17.76	9.279	16.65	5.576	22.04	21.930	-13.37	20.812	-17.77	17.215	-13.66	6.94507	5
7	5.51	17.54	8.18	16.45	4.05	13.04	3.46	12.27	18.16	9.35	13.58	6.30	9.46	19.25	9.06	17.51	5.06	14.41		
	19.209	-22.39	19.864	-19.14	15.901	-16.64	15.435	-18.10	9.266	16.72	5.565	22.04	21.936	-13.33	20.816	-17.75	17.220	-13.67	7.07649	7
9	5.50	17.57	7.60	16.30	4.08	13.02	3.46	12.22	18.07	9.27	13.50	6.22	9.38	19.18	8.58	17.44	4.58	14.34		
	19.354	-22.13	19.711	-18.94	16.037	-17.07	15.522	-18.43	9.252	16.78	5.555	22.03	21.942	-13.30	20.821	-17.74	17.225	-13.67	7.20791	9
11	5.49	17.59	7.40	16.11	4.11	12.60	3.45	12.18	17.58	9.18	13.41	6.13	9.31	19.11	8.51	17.36	4.51	14.26		
	19.499	-21.83	19.529	-18.86	16.175	-17.48	15.610	-18.75	9.238	16.85	5.545	22.03	21.949	-13.27	20.826	-17.72	17.229	-13.67	7.33933	11
13	5.48	18.01	7.22	15.52	4.14	12.58	3.45	12.13	17.49	9.10	13.33	6.05	9.23	19.03	8.43	17.29	4.43	14.18		
	19.644	-21.51	19.341	-18.91	16.316	-17.88	15.698	-19.06	9.223	16.93	5.535	22.03	21.955	-13.23	20.831	-17.70	17.234	-13.68	7.47075	13
15	5.47	18.04	7.04	15.33	4.17	12.56	3.44	12.08	17.39	9.02	13.24	5.56	9.15	18.56	8.35	17.21	4.35	14.11		
	19.787	-21.15	19.170	-19.04	16.459	-18.27	15.787	-19.37	9.208	17.00	5.526	22.03	21.961	-13.20	20.836	-17.68	17.238	-13.68	7.60217	15
17	5.46	18.07	6.49	15.15	4.20	12.54	3.43	12.04	17.30	8.53	13.16	5.48	9.07	18.49	8.27	17.14	4.28	14.03		
	19.930	-20.78	19.031	-19.24	16.604	-18.64	15.876	-19.66	9.192	17.08	5.517	22.03	21.968	-13.16	20.841	-17.66	17.243	-13.68	7.73360	17
19	5.45	18.10	6.37	15.00	4.23	12.53	3.43	11.59	17.21	8.45	13.08	5.39	8.60	18.42	8.20	17.07	4.20	13.55		
	20.072	-20.37	18.935	-19.50	16.751	-18.99	15.965	-19.95	9.176	17.16	5.509	22.03	21.975	-13.13	20.846	-17.64	17.247	-13.68	7.86502	19
21	5.43	18.12	6.28	14.47	4.27	12.52	3.42	11.55	17.11	8.37	12.59	5.31	8.52	18.34	8.12	16.59	4.13	13.48		
	20.213	-19.94	18.882	-19.78	16.901	-19.32	16.054	-20.22	9.159	17.23	5.500	22.03	21.982	-13.09	20.851	-17.62	17.251	-13.68	7.99644	21
23	5.41	18.15	6.22	14.37	4.30	12.51	3.42	11.51	17.02	8.28	12.51	5.23	8.44	18.27	8.04	16.52	4.05	13.40		
	20.354	-19.49	18.873	-20.07	17.052	-19.62	16.144	-20.49	9.142	17.31	5.493	22.03	21.988	-13.05	20.856	-17.60	17.255	-13.69	8.12786	23
25	5.39	18.18	6.18	14.29	4.33	12.50	3.41	11.46	16.53	8.20	12.43	5.14	8.37	18.20	7.57	16.44	3.57	13.33		
	20.493	-19.01	18.900	-20.36	17.205	-19.91	16.234	-20.75	9.125	17.39	5.485	22.03	21.995	-13.01	20.861	-17.58	17.259	-13.69	8.25927	25
27	5.37	18.21	6.15	14.23	4.36	12.50	3.40	11.42	16.43	8.12	12.34	5.06	8.29	18.13	7.49	16.37	3.50	13.25		
	20.632	-18.50	18.960	-20.63	17.359	-20.16	16.324	-20.99	9.107	17.47	5.478	22.03	22.002	-12.98	20.866	-17.56	17.263	-13.69	8.39070	27
29	5.35	18.25	6.14	14.18	4.39	12.50	3.39	11.38	16.34	8.03	12.26	4.58	8.21	18.05	7.41	16.29	3.42	13.17		
	20.770	-17.98	19.047	-20.86	17.515	-20.39	16.415	-21.22	9.090	17.55	5.472	22.04	22.009	-12.94	20.871	-17.54	17.267	-13.69	8.52212	29
31	5.32	18.28	6.14	14.16	4.42	12.50	3.38	11.34	16.24	7.55	12.18	4.50	8.14	17.58	7.34	16.22	3.34	13.10		
	20.907	-17.43	19.156	-21.05	17.673	-20.59	16.505	-21.45	9.072	17.64	5.466	22.04	22.017	-12.90	20.877	-17.52	17.270	-13.68	8.65354	31

LUTY 2003

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ		Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2452																		
32	1	Sob	672	20.59130	-13.30	20.5830	-17.09	0.98537	21.0423	-21.32	60.622	0.0	0	730	1159.2	1629	809	1205.4	1610	847	1
33	2	Nie	673	21.03095	-13.38	21.0234	-16.52	0.98551	21.5700	-17.46	61.229	1.0	1	729	1159.4	1631	833	1255.7	1729	843	2
34	3	Pon	674	21.07061	-13.45	21.0638	-16.34	0.98566	22.4612	-13.15	61.836	2.0	4	727	1159.5	1633	851	1342.2	1846	839	3
35	4	Wto	675	21.11026	-13.51	21.1041	-16.17	0.98580	23.3234	-8.16	62.400	3.0	9	725	1159.6	1635	905	1425.7	1959	835	4
36	5	Śro	676	21.14592	-13.57	21.1443	-15.59	0.98595	0.1653	-3.04	62.878	4.0	16	723	1159.7	1637	918	1507.1	2111	831	5
37	6	Czw	677	21.18557	-14.01	21.1844	-15.40	0.98611	1.0006	2.10	63.225	5.0	23	722	1159.8	1639	929	1547.3	2221	827	6
38	7	Pią	678	21.22523	-14.05	21.2244	-15.22	0.98627	1.4309	7.16	63.407	6.0	32	720	1159.8	1641	941	1627.6	2331	824	7
39	8	Sob	679	21.26488	-14.08	21.2644	-15.03	0.98643	2.2659	12.06	63.399	7.0	41	718	1159.9	1642	953	1708.9	****	820	8
40	9	Nie	680	21.30454	-14.10	21.3043	-14.44	0.98659	3.1227	16.30	63.187	8.0	50	716	1159.9	1644	1008	1752.2	042	816	9
41	10	Pon	681	21.34419	-14.12	21.3441	-14.24	0.98676	4.0021	20.18	62.776	1.0	59	714	1159.9	1646	1027	1838.3	154	812	10
42	11	Wto	682	21.38385	-14.12	21.3838	-14.05	0.98694	4.5114	23.17	62.187	2.0	69	712	1160.0	1648	1052	1927.9	306	808	11
43	12	Śro	683	21.42350	-14.12	21.4234	-13.45	0.98712	5.4516	25.14	61.456	3.0	77	710	1159.9	1650	1127	2020.8	417	804	12
44	13	Czw	684	21.46316	-14.11	21.4630	-13.25	0.98730	6.4160	25.55	60.633	4.0	85	708	1159.9	1652	1216	2116.4	520	800	13
45	14	Pią	685	21.50282	-14.09	21.5025	-13.05	0.98749	7.4026	25.11	59.782	5.0	92	706	1159.9	1654	1320	2213.4	613	756	14
46	15	Sob	686	21.54247	-14.07	21.5419	-12.44	0.98768	8.3912	22.58	58.969	6.0	97	704	1159.9	1656	1437	2310.1	654	752	15
47	16	Nie	687	21.58213	-14.04	21.5812	-12.24	0.98788	9.3704	19.20	58.259	7.0	100	702	1159.8	1658	1602	*****	724	748	16
48	17	Pon	688	22.02178	-13.60	22.0205	-12.03	0.98808	10.3316	14.29	57.709	0.5	100	700	1159.7	1700	1731	005.3	747	744	17
49	18	Wto	689	22.06144	-13.55	22.0557	-11.42	0.98829	11.2741	8.45	57.354	1.5	97	658	1159.7	1702	1859	058.5	805	740	18
50	19	Śro	690	22.10109	-13.50	22.0948	-11.20	0.98850	12.2048	2.30	57.207	2.5	92	656	1159.6	1704	2027	149.9	821	736	19
51	20	Czw	691	22.14075	-13.44	22.1338	-10.59	0.98872	13.1324	-3.53	57.260	3.5	84	654	1159.5	1706	2155	240.4	835	732	20
52	21	Pią	692	22.18040	-13.37	22.1728	-10.37	0.98894	14.0624	-10.01	57.484	4.5	75	652	1159.4	1708	2323	330.9	851	728	21
53	22	Sob	693	22.22006	-13.30	22.2118	-10.16	0.98917	15.0042	-15.34	57.840	5.5	64	650	1159.2	1710	****	422.5	908	725	22
54	23	Nie	694	22.25571	-13.22	22.2506	-9.54	0.98940	15.5653	-20.11	58.287	6.5	53	648	1159.1	1712	051	516.1	930	721	23
55	24	Pon	695	22.29537	-13.14	22.2855	-9.32	0.98963	16.5500	-23.34	58.788	0.8	42	645	1159.0	1714	217	611.9	959	717	24
56	25	Wto	696	22.33503	-13.05	22.3242	-9.09	0.98987	17.5431	-25.32	59.317	1.8	31	643	1158.8	1715	336	709.4	1039	713	25
57	26	Śro	697	22.37468	-12.55	22.3629	-8.47	0.99011	18.5412	-25.59	59.853	2.8	21	641	1158.7	1717	443	807.5	1132	709	26
58	27	Czw	698	22.41434	-12.45	22.4016	-8.25	0.99035	19.5238	-24.55	60.390	3.8	13	639	1158.5	1719	534	904.4	1239	705	27
59	28	Pią	699	22.45399	-12.34	22.4401	-8.02	0.99059	20.4834	-22.31	60.920	4.8	7	636	1158.3	1721	611	958.7	1354	701	28

Fazy Księżyca [Dm, h.mm]: Nów 1, 11.48 1kw 9, 12.11 Pełn 17, 0.51 3kw 23, 17.46

LUTY 2003 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	5.31	18.29	6.14	14.15	4.44	12.50	3.38	11.32	16.20	7.51	12.14	4.46	8.10	17.55	7.30	16.18	3.31	13.06		
	20.975	-17.15	19.218	-21.12	17.752	-20.67	16.551	-21.56	9.063	17.68	5.463	22.04	22.020	-12.88	20.879	-17.51	17.272	-13.68	8.71925	1
3	5.28	18.33	6.15	14.14	4.46	12.51	3.37	11.28	16.10	7.42	12.05	4.37	8.02	17.47	7.22	16.11	3.23	12.58		
	21.111	-16.57	19.353	-21.22	17.912	-20.82	16.642	-21.76	9.045	17.76	5.458	22.04	22.027	-12.84	20.884	-17.49	17.276	-13.68	8.85067	3
5	5.25	18.36	6.17	14.15	4.49	12.52	3.36	11.25	16.01	7.34	11.57	4.29	7.55	17.40	7.14	16.03	3.15	12.51		
	21.245	-15.98	19.502	-21.26	18.072	-20.94	16.734	-21.96	9.027	17.83	5.453	22.05	22.035	-12.80	20.889	-17.47	17.279	-13.68	8.98209	5
7	5.22	18.39	6.18	14.17	4.51	12.53	3.35	11.21	15.51	7.25	11.49	4.21	7.47	17.33	7.07	15.56	3.08	12.43		
	21.379	-15.36	19.662	-21.22	18.234	-21.02	16.825	-22.15	9.010	17.91	5.449	22.05	22.042	-12.76	20.894	-17.45	17.282	-13.68	9.11351	7
9	5.19	18.43	6.20	14.20	4.53	12.55	3.34	11.17	15.42	7.17	11.41	4.13	7.39	17.26	6.59	15.49	2.60	12.35		
	21.512	-14.73	19.832	-21.11	18.397	-21.07	16.917	-22.32	8.992	17.99	5.445	22.05	22.049	-12.72	20.900	-17.43	17.285	-13.68	9.24493	9
11	5.16	18.46	6.21	14.24	4.55	12.56	3.33	11.14	15.32	7.09	11.33	4.05	7.32	17.19	6.51	15.41	2.52	12.28		
	21.644	-14.08	20.009	-20.92	18.560	-21.08	17.009	-22.48	8.975	18.06	5.442	22.06	22.057	-12.68	20.905	-17.41	17.288	-13.67	9.37635	11
13	5.12	18.50	6.22	14.29	4.57	12.59	3.31	11.10	15.23	7.00	11.25	3.57	7.24	17.11	6.44	15.34	2.44	12.20		
	21.775	-13.42	20.193	-20.64	18.724	-21.05	17.101	-22.64	8.957	18.14	5.439	22.06	22.064	-12.64	20.910	-17.39	17.291	-13.67	9.50777	13
15	5.08	18.53	6.23	14.35	4.59	13.01	3.30	11.07	15.14	6.52	11.17	3.49	7.16	17.04	6.36	15.26	2.37	12.12		
	21.905	-12.74	20.382	-20.29	18.888	-20.99	17.193	-22.78	8.940	18.21	5.437	22.07	22.071	-12.60	20.915	-17.37	17.294	-13.67	9.63919	15
17	5.05	18.57	6.24	14.42	5.00	13.04	3.29	11.03	15.04	6.43	11.09	3.41	7.09	16.57	6.28	15.19	2.29	12.05		
	22.035	-12.04	20.576	-19.85	19.053	-20.89	17.285	-22.91	8.924	18.28	5.436	22.07	22.079	-12.56	20.920	-17.35	17.297	-13.66	9.77061	17
19	5.01	19.00	6.25	14.49	5.01	13.07	3.27	11.00	14.55	6.35	11.01	3.33	7.01	16.50	6.21	15.11	2.21	11.57		
	22.163	-11.34	20.774	-19.33	19.218	-20.75	17.378	-23.02	8.908	18.35	5.435	22.08	22.086	-12.52	20.924	-17.33	17.299	-13.66	9.90203	19
21	4.57	19.04	6.25	14.58	5.02	13.10	3.26	10.57	14.46	6.27	10.53	3.26	6.53	16.43	6.13	15.04	2.14	11.49		
	22.291	-10.62	20.975	-18.72	19.384	-20.58	17.471	-23.13	8.892	18.41	5.434	22.09	22.094	-12.48	20.929	-17.31	17.301	-13.66	10.03344	21
23	4.53	19.08	6.25	15.06	5.02	13.13	3.24	10.54	14.37	6.18	10.45	3.18	6.46	16.36	6.05	14.56	2.06	11.41		
	22.418	-9.89	21.179	-18.03	19.549	-20.36	17.563	-23.23	8.876	18.48	5.434	22.09	22.101	-12.44	20.934	-17.29	17.304	-13.65	10.16486	23
25	4.48	19.11	6.24	15.16	5.03	13.17	3.23	10.51	14.27	6.10	10.37	3.10	6.38	16.28	5.57	14.49	1.58	11.34		
	22.545	-9.16	21.385	-17.25	19.714	-20.11	17.656	-23.31	8.861	18.54	5.435	22.10	22.108	-12.40	20.939	-17.27	17.306	-13.65	10.29628	25
27	4.44	19.15	6.23	15.26	5.03	13.21	3.21	10.48	14.18	6.02	10.29	3.02	6.30	16.21	5.50	14.42	1.50	11.26		
	22.671	-8.41	21.594	-16.39	19.880	-19.82	17.749	-23.38	8.847	18.60	5.436	22.11	22.116	-12.36	20.944	-17.25	17.307	-13.64	10.42770	27

MARZEC 2003

Piwnice, CA UMK				← Dane na godz. 12 czasu strefowego (= 11 lub 10 ^h UT) →										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2452																					
60	1	Sob	700	22.49365	-12.23	22.4747	-7.39	0.99083	21.4121	-19.02	61.441	5.8	3	634	1158.1	1723	637	1049.4	1511	657	1
61	2	Nie	701	22.53330	-12.12	22.5132	-7.16	0.99108	22.3056	-14.42	61.944	6.8	0	632	1157.9	1725	657	1136.6	1628	653	2
62	3	Pon	702	22.57296	-11.59	22.5516	-6.53	0.99133	23.1746	-9.50	62.418	0.4	0	630	1157.7	1727	712	1221.0	1743	649	3
63	4	Wto	703	23.01261	-11.47	22.5860	-6.30	0.99157	0.0231	-4.39	62.843	1.4	2	627	1157.5	1729	724	1302.8	1855	645	4
64	5	Śro	704	23.05227	-11.34	23.0243	-6.07	0.99182	0.4600	0.39	63.193	2.4	5	625	1157.3	1731	736	1343.5	2006	641	5
65	6	Czw	705	23.09192	-11.20	23.0626	-5.44	0.99207	1.2905	5.52	63.440	3.4	10	623	1157.1	1732	747	1423.7	2117	637	6
66	7	Pią	706	23.13158	-11.06	23.1009	-5.21	0.99232	2.1237	10.50	63.554	4.4	17	620	1156.8	1734	759	1504.5	2227	633	7
67	8	Sob	707	23.17123	-10.52	23.1351	-4.57	0.99258	2.5724	15.24	63.508	5.4	24	618	1156.6	1736	813	1546.8	2339	629	8
68	9	Nie	708	23.21089	-10.37	23.1733	-4.34	0.99283	3.4409	19.24	63.283	6.4	33	616	1156.4	1738	829	1631.4	****	626	9
69	10	Pon	709	23.25055	-10.22	23.2114	-4.10	0.99309	4.3327	22.39	62.869	7.4	42	613	1156.1	1740	851	1718.8	051	622	10
70	11	Wto	710	23.29020	-10.06	23.2455	-3.47	0.99335	5.2534	24.56	62.273	0.2	52	611	1155.9	1742	921	1809.3	202	618	11
71	12	Śro	711	23.32586	-9.50	23.2836	-3.23	0.99361	6.2020	26.04	61.514	1.2	61	609	1155.6	1744	1002	1902.7	308	614	12
72	13	Czw	712	23.36551	-9.34	23.3216	-2.60	0.99387	7.1706	25.53	60.632	2.2	71	606	1155.3	1745	1058	1958.0	404	610	13
73	14	Pią	713	23.40517	-9.18	23.3557	-2.36	0.99414	8.1449	24.15	59.682	3.2	80	604	1155.0	1747	1208	2053.9	449	606	14
74	15	Sob	714	23.44482	-9.01	23.3936	-2.12	0.99440	9.1224	21.11	58.733	4.2	88	601	1154.8	1749	1330	2149.3	523	602	15
75	16	Nie	715	23.48448	-8.44	23.4316	-1.49	0.99467	10.0900	16.48	57.864	5.2	94	559	1154.5	1751	1457	2243.4	548	558	16
76	17	Pon	716	23.52413	-8.27	23.4655	-1.25	0.99495	11.0422	11.20	57.151	6.2	99	557	1154.2	1753	1627	2336.1	608	554	17
77	18	Wto	717	23.56379	-8.09	23.5034	-1.01	0.99522	11.5842	5.06	56.659	0.0	100	554	1153.9	1755	1757	*****	625	550	18
78	19	Śro	718	24.00344	-7.52	23.5413	-0.38	0.99550	12.5238	-1.30	56.429	1.0	98	552	1153.6	1756	1928	028.1	640	546	19
79	20	Czw	719	0.04310	-7.34	23.5752	-0.14	0.99578	13.4702	-8.02	56.473	2.0	94	550	1153.3	1758	2059	120.0	655	542	20
80	21	Pią	720	0.08275	-7.16	0.0131	0.10	0.99607	14.4243	-14.04	56.770	3.0	87	547	1153.0	1800	2231	213.0	711	538	21
81	22	Sob	721	0.12241	-6.58	0.0509	0.34	0.99635	15.4013	-19.12	57.277	4.0	78	545	1152.7	1802	****	307.8	732	534	22
82	23	Nie	722	0.16206	-6.40	0.0848	0.57	0.99664	16.3935	-23.05	57.932	5.0	68	542	1152.4	1804	002	404.8	758	531	23
83	24	Pon	723	0.20172	-6.22	0.1226	1.21	0.99693	17.4011	-25.28	58.672	6.0	57	540	1152.1	1805	127	503.5	835	527	24
84	25	Wto	724	0.24137	-6.04	0.1605	1.44	0.99722	18.4046	-26.16	59.440	0.4	46	538	1151.8	1807	239	602.6	925	523	25
85	26	Śro	725	0.28103	-5.46	0.1943	2.08	0.99751	19.3951	-25.30	60.191	1.4	35	535	1151.5	1809	335	700.4	1029	519	26
86	27	Czw	726	0.32069	-5.28	0.2322	2.32	0.99781	20.3613	-23.22	60.892	2.4	26	533	1151.2	1811	416	755.4	1142	515	27
87	28	Pią	727	0.36034	-5.10	0.2700	2.55	0.99810	21.2914	-20.05	61.526	3.4	17	530	1150.9	1813	444	846.8	1259	511	28
88	29	Sob	728	0.39600	-4.52	0.3039	3.18	0.99839	22.1857	-15.57	62.084	4.4	10	528	1150.6	1814	504	934.5	1416	507	29
89	30	Nie	729	0.43565	-4.34	0.3417	3.42	0.99868	23.0549	-11.12	62.564	5.4	5	526	1150.3	1816	520	1019.0	1530	503	30
89	30	Nie	729	23.43467	-4.34	0.3408	3.41	0.99867	23.0354	-11.25	62.545	5.3	5	626	1250.3	1916	620	1119.0	1630	603	30
90	31	Pon	730	23.47432	-4.16	0.3747	4.04	0.99896	23.4843	-6.18	62.949	6.3	2	623	1250.0	1918	633	1201.0	1743	559	31

Fazy Księżyca [Dm, h.mm]: Nów 3, 3.35 1kw 11, 8.15 Pełn 18, 11.34 3kw 25, 2.51 3kw 25, 3.51

MARZEC 2003 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST (0^h UT) Dm	
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach		
1	4.40	19.19	6.22	15.36	5.03	13.25	3.19	10.46	14.09	5.53	10.21	2.55	6.23	16.14	5.42	14.34	1.42	11.18		
	22.796	-7.65	21.804	-15.43	20.045	-19.49	17.841	-23.44	8.833	18.65	5.437	22.12	22.123	-12.32	20.948	-17.23	17.309	-13.64	10.55912	1
3	4.35	19.23	6.21	15.48	5.02	13.30	3.17	10.43	14.00	5.45	10.14	2.47	6.15	16.07	5.34	14.27	1.35	11.11		
	22.921	-6.89	22.017	-14.40	20.209	-19.12	17.934	-23.49	8.820	18.70	5.440	22.13	22.130	-12.28	20.953	-17.21	17.311	-13.63	10.69054	3
5	4.30	19.27	6.19	15.59	5.02	13.34	3.15	10.40	13.51	5.37	10.06	2.39	6.07	15.60	5.27	14.19	1.27	11.03		
	23.045	-6.12	22.232	-13.27	20.373	-18.72	18.027	-23.53	8.808	18.75	5.442	22.14	22.137	-12.24	20.957	-17.19	17.312	-13.62	10.82196	5
7	4.26	19.30	6.17	16.11	5.01	13.39	3.13	10.38	13.42	5.28	9.58	2.32	5.60	15.52	5.19	14.12	1.19	10.55		
	23.169	-5.35	22.449	-12.06	20.537	-18.29	18.120	-23.55	8.796	18.80	5.445	22.15	22.145	-12.20	20.962	-17.18	17.313	-13.62	10.95337	7
9	4.21	19.34	6.15	16.24	4.59	13.44	3.11	10.35	13.34	5.20	9.50	2.24	5.52	15.45	5.11	14.04	1.11	10.47		
	23.292	-4.57	22.667	-10.77	20.700	-17.81	18.212	-23.57	8.785	18.84	5.449	22.16	22.152	-12.16	20.966	-17.16	17.315	-13.61	11.08479	9
11	4.16	19.38	6.13	16.37	4.58	13.49	3.08	10.33	13.25	5.12	9.43	2.17	5.45	15.38	5.04	13.57	1.03	10.40		
	23.415	-3.78	22.888	-9.39	20.862	-17.31	18.305	-23.57	8.775	18.88	5.454	22.17	22.159	-12.13	20.970	-17.14	17.316	-13.61	11.21621	11
13	4.11	19.42	6.10	16.51	4.56	13.54	3.06	10.31	13.16	5.04	9.35	2.09	5.37	15.31	4.56	13.49	0.55	10.32		
	23.538	-3.00	23.112	-7.93	21.023	-16.77	18.397	-23.56	8.765	18.92	5.458	22.18	22.166	-12.09	20.974	-17.12	17.316	-13.60	11.34764	13
15	4.06	19.47	6.07	17.05	4.55	13.60	3.03	10.28	13.08	4.56	9.27	2.02	5.29	15.23	4.48	13.42	0.48	10.24		
	23.660	-2.21	23.337	-6.39	21.184	-16.20	18.489	-23.54	8.756	18.95	5.464	22.19	22.173	-12.05	20.979	-17.11	17.317	-13.59	11.47905	15
17	4.00	19.51	6.04	17.19	4.53	14.05	3.01	10.26	12.59	4.47	9.20	1.54	5.22	15.16	4.40	13.34	0.40	10.16		
	23.782	-1.42	23.566	-4.78	21.344	-15.60	18.581	-23.51	8.748	18.98	5.470	22.20	22.180	-12.01	20.982	-17.09	17.318	-13.59	11.61047	17
19	3.55	19.55	6.01	17.34	4.51	14.10	2.58	10.24	12.51	4.39	9.12	1.47	5.14	15.09	4.33	13.27	0.32	10.08		
	23.904	-0.63	23.797	-3.09	21.503	-14.97	18.673	-23.47	8.741	19.01	5.476	22.21	22.186	-11.98	20.986	-17.07	17.318	-13.58	11.74189	19
21	3.49	19.59	5.58	17.50	4.48	14.16	2.55	10.22	12.42	4.31	9.05	1.39	5.06	15.02	4.25	13.19	0.24	10.01		
	0.025	0.16	0.032	-1.34	21.661	-14.31	18.764	-23.42	8.735	19.03	5.483	22.22	22.193	-11.94	20.990	-17.06	17.318	-13.57	11.87330	21
23	3.44	20.04	5.55	18.06	4.46	14.22	2.52	10.20	12.34	4.23	8.57	1.32	4.58	14.54	4.17	13.12	0.16	9.53		
	0.147	0.95	0.269	0.47	21.819	-13.63	18.856	-23.36	8.729	19.05	5.490	22.23	22.200	-11.90	20.994	-17.04	17.318	-13.56	12.00472	23
25	3.38	20.08	5.52	18.22	4.43	14.27	2.49	10.19	12.26	4.15	8.50	1.25	4.51	14.47	4.09	13.04	0.08	9.45		
	0.268	1.74	0.508	2.33	21.975	-12.92	18.947	-23.28	8.725	19.07	5.498	22.25	22.206	-11.87	20.997	-17.03	17.318	-13.56	12.13614	25
27	3.33	20.13	5.48	18.39	4.40	14.33	2.46	10.17	12.17	4.07	8.42	1.18	4.43	14.40	4.02	12.56	23.56	9.37		
	0.389	2.53	0.750	4.21	22.131	-12.18	19.038	-23.20	8.721	19.08	5.506	22.26	22.212	-11.83	21.001	-17.02	17.318	-13.55	12.26756	27
29	3.27	20.17	5.44	18.55	4.37	14.39	2.43	10.15	12.09	3.59	8.35	1.10	4.35	14.33	3.54	12.49	23.48	9.29		
	0.511	3.31	0.992	6.11	22.286	-11.42	19.129	-23.11	8.718	19.09	5.515	22.27	22.219	-11.80	21.004	-17.00	17.318	-13.54	12.39898	29
31	4.21	21.22	6.41	20.12	5.34	15.44	3.40	11.13	13.01	4.51	9.27	2.03	5.28	15.25	4.46	13.41	0.44	10.21		
	0.630	4.07	1.228	7.95	22.437	-10.66	19.217	-23.00	8.716	19.09	5.524	22.28	22.225	-11.77	21.007	-16.99	17.317	-13.54	12.53040	31

KWIECIEŃ 2003

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)											Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2452																			
91	1	Wto	731	23.51398	-3.59	0.4125	4.27	0.99925	0.3210	-1.00	63.273	7.3	0	621	1249.7	1920	644	1241.6	1854	555	1	
92	2	Śro	732	23.55363	-3.41	0.4504	4.51	0.99953	1.1506	4.17	63.510	0.6	0	618	1249.4	1922	655	1321.7	2004	551	2	
93	3	Czw	733	23.59329	-3.23	0.4843	5.14	0.99982	1.5819	9.23	63.652	1.6	2	616	1249.1	1923	706	1402.2	2115	547	3	
94	4	Pią	734	0.03294	-3.06	0.5222	5.37	1.00011	2.4237	14.08	63.685	2.6	6	614	1248.8	1925	719	1443.8	2227	543	4	
95	5	Sob	735	0.07260	-2.48	0.5601	5.59	1.00039	3.2838	18.22	63.590	3.6	11	611	1248.6	1927	734	1527.4	2339	539	5	
96	6	Nie	736	0.11225	-2.31	0.5941	6.22	1.00067	4.1654	21.53	63.351	4.6	18	609	1248.3	1929	753	1613.6	****	535	6	
97	7	Pon	737	0.15191	-2.14	1.0320	6.45	1.00095	5.0741	24.30	62.956	5.6	26	607	1248.0	1931	819	1702.5	050	532	7	
98	8	Wto	738	0.19156	-1.57	1.0700	7.07	1.00123	6.0051	26.02	62.400	6.6	35	604	1247.7	1932	855	1754.0	158	528	8	
99	9	Śro	739	0.23122	-1.41	1.1040	7.30	1.00151	6.5555	26.20	61.688	7.6	44	602	1247.4	1934	944	1847.4	258	524	9	
100	10	Czw	740	0.27088	-1.24	1.1420	7.52	1.00179	7.5200	25.17	60.842	0.4	54	600	1247.2	1936	1047	1941.7	346	520	10	
101	11	Pią	741	0.31053	-1.08	1.1801	8.14	1.00207	8.4810	22.51	59.900	1.4	65	557	1246.9	1938	1202	2035.7	423	516	11	
102	12	Sob	742	0.35019	-0.53	1.2141	8.36	1.00235	9.4342	19.06	58.918	2.4	75	555	1246.6	1940	1325	2128.8	451	512	12	
103	13	Nie	743	0.38584	-0.37	1.2522	8.58	1.00263	10.3817	14.10	57.967	3.4	84	553	1246.4	1941	1452	2220.9	512	508	13	
104	14	Pon	744	0.42550	-0.22	1.2904	9.20	1.00291	11.3205	8.19	57.128	4.4	92	550	1246.1	1943	1621	2312.4	529	504	14	
105	15	Wto	745	0.46515	-0.07	1.3245	9.41	1.00319	12.2543	1.50	56.481	5.4	97	548	1245.9	1945	1751	*****	544	500	15	
106	16	Śro	746	0.50481	0.08	1.3627	10.03	1.00347	13.1960	-4.52	56.093	6.4	100	546	1245.6	1947	1923	004.1	558	456	16	
107	17	Czw	747	0.54446	0.22	1.4010	10.24	1.00375	14.1551	-11.21	56.004	0.6	99	543	1245.4	1948	2057	057.0	614	452	17	
108	18	Pią	748	0.58412	0.36	1.4352	10.45	1.00403	15.1358	-17.08	56.219	1.6	96	541	1245.2	1950	2232	152.1	632	448	18	
109	19	Sob	749	1.02377	0.49	1.4736	11.06	1.00431	16.1434	-21.47	56.710	2.6	90	539	1244.9	1952	****	250.1	656	444	19	
110	20	Nie	750	1.06343	1.02	1.5119	11.27	1.00459	17.1702	-24.55	57.418	3.6	82	537	1244.7	1954	005	350.5	729	440	20	
111	21	Pon	751	1.10308	1.15	1.5503	11.47	1.00487	18.1959	-26.21	58.271	4.6	72	535	1244.5	1956	127	452.0	815	436	21	
112	22	Wto	752	1.14274	1.27	1.5848	12.07	1.00515	19.2133	-26.05	59.192	5.6	62	532	1244.3	1957	231	552.6	916	433	22	
113	23	Śro	753	1.18240	1.39	2.0233	12.28	1.00543	20.2008	-24.18	60.110	6.6	51	530	1244.1	1959	318	650.3	1028	429	23	
114	24	Czw	754	1.22205	1.50	2.0618	12.47	1.00570	21.1453	-21.16	60.970	0.9	41	528	1243.9	2001	350	743.8	1146	425	24	
115	25	Pią	755	1.26171	2.00	2.1004	13.07	1.00598	22.0546	-17.18	61.734	1.9	31	526	1243.7	2003	412	833.0	1304	421	25	
116	26	Sob	756	1.30136	2.11	2.1350	13.27	1.00625	22.5318	-12.40	62.378	2.9	22	524	1243.6	2005	429	918.3	1420	417	26	
117	27	Nie	757	1.34102	2.20	2.1737	13.46	1.00652	23.3818	-7.38	62.894	3.9	14	522	1243.4	2006	442	1000.8	1533	413	27	
118	28	Pon	758	1.38067	2.29	2.2124	14.05	1.00679	0.2142	-2.22	63.280	4.9	8	520	1243.3	2008	454	1041.5	1644	409	28	
119	29	Wto	759	1.42033	2.38	2.2512	14.24	1.00705	1.0424	2.56	63.545	5.9	4	518	1243.1	2010	504	1121.3	1754	405	29	
120	30	Śro	760	1.45598	2.46	2.2901	14.42	1.00731	1.4717	8.07	63.695	6.9	1	516	1243.0	2012	515	1201.3	1904	401	30	

Fazy Księżyca [Dm, h.mm]: Nów 1, 21.18 1kw 10, 1.40 Pełn 16, 21.36 3kw 23, 14.18

KWIECIEŃ 2003 (c.d.)

Świty, zmierny astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE			MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)		
1	4.18	21.25	6.39	20.20	5.33	15.47	3.38	11.12	12.57	4.47	9.24	1.59	5.24	15.22	4.42	13.37	0.40	10.17			
	0.690	4.46	1.348	8.87	22.514	-10.26	19.262	-22.95	8.715	19.09	5.529	22.29	22.228	-11.75	21.009	-16.98	17.317	-13.53	12.59611	1	
3	4.12	21.29	6.35	20.37	5.29	15.53	3.35	11.11	12.49	4.39	9.16	1.52	5.16	15.14	4.34	13.30	0.32	10.10			
	0.812	5.23	1.584	10.67	22.668	-9.45	19.352	-22.83	8.714	19.10	5.538	22.30	22.234	-11.72	21.012	-16.97	17.316	-13.52	12.72752	3	
5	4.06	21.35	6.31	20.52	5.26	15.59	3.31	11.09	12.42	4.31	9.09	1.45	5.09	15.07	4.27	13.22	0.24	10.02			
	0.934	5.99	1.812	12.38	22.820	-8.62	19.441	-22.70	8.715	19.09	5.549	22.32	22.239	-11.69	21.015	-16.96	17.315	-13.52	12.85894	5	
7	3.59	21.40	6.26	21.07	5.23	16.05	3.28	11.08	12.34	4.24	9.02	1.38	5.01	14.60	4.19	13.15	0.17	9.54			
	1.056	6.75	2.031	13.97	22.972	-7.78	19.530	-22.57	8.716	19.09	5.559	22.33	22.245	-11.65	21.018	-16.95	17.314	-13.51	12.99036	7	
9	3.53	21.45	6.22	21.20	5.19	16.11	3.24	11.06	12.26	4.16	8.54	1.31	4.53	14.52	4.11	13.07	0.09	9.46			
	1.178	7.50	2.237	15.42	23.123	-6.92	19.618	-22.42	8.717	19.08	5.570	22.34	22.251	-11.62	21.020	-16.94	17.313	-13.50	13.12178	9	
11	3.47	21.50	6.17	21.32	5.16	16.17	3.21	11.05	12.18	4.08	8.47	1.24	4.45	14.45	4.03	12.59	23.57	9.38			
	1.300	8.24	2.427	16.70	23.274	-6.04	19.706	-22.27	8.720	19.07	5.582	22.36	22.256	-11.60	21.023	-16.93	17.312	-13.49	13.25320	11	
13	3.40	21.56	6.13	21.42	5.12	16.22	3.17	11.03	12.11	4.00	8.40	1.17	4.38	14.38	3.56	12.52	23.49	9.30			
	1.423	8.97	2.599	17.81	23.424	-5.16	19.794	-22.11	8.724	19.05	5.594	22.37	22.261	-11.57	21.025	-16.92	17.310	-13.49	13.38462	13	
15	3.33	22.02	6.08	21.49	5.08	16.28	3.13	11.02	12.03	3.53	8.33	1.10	4.30	14.30	3.48	12.44	23.41	9.22			
	1.546	9.69	2.751	18.73	23.574	-4.26	19.881	-21.94	8.728	19.03	5.606	22.38	22.267	-11.54	21.027	-16.91	17.309	-13.48	13.51604	15	
17	3.26	22.08	6.03	21.54	5.04	16.34	3.09	11.00	11.56	3.45	8.25	1.03	4.22	14.23	3.40	12.36	23.33	9.14			
	1.669	10.40	2.881	19.47	23.723	-3.35	19.968	-21.76	8.733	19.01	5.619	22.39	22.272	-11.51	21.030	-16.90	17.307	-13.47	13.64745	17	
19	3.20	22.14	5.57	21.56	5.01	16.40	3.05	10.59	11.49	3.37	8.18	0.56	4.15	14.15	3.32	12.29	23.25	9.06			
	1.793	11.10	2.986	20.01	23.872	-2.44	20.054	-21.57	8.739	18.98	5.632	22.41	22.276	-11.49	21.032	-16.89	17.305	-13.46	13.77887	19	
21	3.12	22.20	5.52	21.55	4.57	16.46	3.01	10.58	11.41	3.30	8.11	0.49	4.07	14.08	3.24	12.21	23.17	8.58			
	1.918	11.78	3.067	20.36	0.021	-1.52	20.139	-21.38	8.746	18.96	5.645	22.42	22.281	-11.46	21.033	-16.88	17.303	-13.46	13.91029	21	
23	3.05	22.27	5.46	21.52	4.53	16.52	2.57	10.56	11.34	3.22	8.04	0.42	3.59	14.00	3.17	12.13	23.09	8.51			
	2.042	12.46	3.122	20.52	0.170	-0.59	20.224	-21.18	8.753	18.92	5.659	22.43	22.285	-11.44	21.035	-16.88	17.301	-13.45	14.04172	23	
25	2.58	22.34	5.40	21.46	4.49	16.58	2.52	10.55	11.27	3.14	7.57	0.35	3.51	13.53	3.09	12.05	23.01	8.43			
	2.168	13.12	3.152	20.48	0.319	0.34	20.309	-20.98	8.762	18.89	5.672	22.44	22.290	-11.41	21.037	-16.87	17.299	-13.44	14.17314	25	
27	2.50	22.41	5.34	21.37	4.45	17.04	2.48	10.53	11.20	3.07	7.50	0.28	3.44	13.45	3.01	11.58	22.52	8.35			
	2.294	13.77	3.158	20.25	0.468	1.27	20.392	-20.77	8.771	18.85	5.687	22.45	22.294	-11.39	21.038	-16.86	17.297	-13.44	14.30455	27	
29	2.42	22.49	5.28	21.25	4.41	17.10	2.44	10.52	11.13	2.59	7.43	0.21	3.36	13.38	2.53	11.50	22.44	8.27			
	2.420	14.40	3.141	19.85	0.616	2.20	20.476	-20.55	8.781	18.81	5.701	22.47	22.298	-11.37	21.039	-16.86	17.295	-13.43	14.43597	29	

MAJ 2003

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2452																					
121	1	Czw	761	1.49564	2.54	2.3250	15.01	1.00757	2.3109	12.60	63.737	7.9	0	514	1242.8	2013	527	1242.4	2016	357	1
122	2	Pią	762	1.53529	3.01	2.3639	15.19	1.00782	3.1642	17.24	63.675	0.9	1	512	1242.7	2015	541	1325.4	2128	353	2
123	3	Sob	763	1.57495	3.07	2.4029	15.37	1.00807	4.0427	21.09	63.508	1.9	3	510	1242.6	2017	558	1410.7	2240	349	3
124	4	Nie	764	2.01460	3.13	2.4420	15.54	1.00832	4.5440	24.02	63.230	2.9	7	508	1242.5	2019	622	1458.8	2350	345	4
125	5	Pon	765	2.05426	3.19	2.4811	16.12	1.00856	5.4711	25.52	62.837	3.9	13	506	1242.4	2020	653	1549.4	****	341	5
126	6	Wto	766	2.09392	3.24	2.5203	16.29	1.00880	6.4129	26.30	62.322	4.9	20	504	1242.4	2022	737	1641.8	053	338	6
127	7	Śro	767	2.13357	3.28	2.5555	16.45	1.00903	7.3641	25.49	61.685	5.9	29	502	1242.3	2024	835	1735.1	144	334	7
128	8	Czw	768	2.17323	3.32	2.5948	17.02	1.00926	8.3149	23.49	60.935	6.9	39	500	1242.2	2026	945	1828.0	224	330	8
129	9	Pią	769	2.21288	3.35	3.0341	17.18	1.00949	9.2607	20.32	60.093	7.9	49	458	1242.2	2027	1103	1919.8	254	326	9
130	10	Sob	770	2.25254	3.38	3.0735	17.34	1.00972	10.1919	16.07	59.194	0.9	60	456	1242.1	2029	1226	2010.5	317	322	10
131	11	Nie	771	2.29219	3.40	3.1129	17.50	1.00994	11.1135	10.44	58.293	1.9	71	455	1242.1	2031	1351	2100.2	334	318	11
132	12	Pon	772	2.33185	3.42	3.1524	18.05	1.01017	12.0332	4.38	57.456	2.9	81	453	1242.1	2032	1518	2150.0	349	314	12
133	13	Wto	773	2.37150	3.43	3.1920	18.20	1.01039	12.5603	-1.52	56.757	3.9	89	451	1242.0	2034	1647	2240.9	403	310	13
134	14	Śro	774	2.41116	3.43	3.2316	18.35	1.01060	13.5010	-8.26	56.270	4.9	95	450	1242.0	2036	1819	2334.1	417	306	14
135	15	Czw	775	2.45082	3.43	3.2712	18.49	1.01082	14.4653	-14.35	56.052	5.9	99	448	1242.0	2037	1953	*****	434	302	15
136	16	Pią	776	2.49047	3.42	3.3110	19.03	1.01104	15.4647	-19.52	56.132	0.3	100	446	1242.0	2039	2129	030.5	454	258	16
137	17	Sob	777	2.53013	3.41	3.3507	19.17	1.01125	16.4942	-23.48	56.509	1.3	98	445	1242.1	2040	2300	130.6	522	254	17
138	18	Nie	778	2.56578	3.39	3.3906	19.30	1.01146	17.5423	-26.02	57.143	2.3	93	443	1242.1	2042	****	233.5	602	250	18
139	19	Pon	779	3.00544	3.37	3.4305	19.43	1.01167	18.5844	-26.26	57.972	3.3	85	442	1242.1	2044	016	336.9	657	246	19
140	20	Wto	780	3.04510	3.34	3.4704	19.56	1.01187	20.0033	-25.07	58.916	4.3	76	440	1242.2	2045	113	438.4	808	242	20
141	21	Śro	781	3.08475	3.30	3.5104	20.08	1.01208	20.5819	-22.23	59.897	5.3	67	439	1242.2	2047	152	535.6	927	239	21
142	22	Czw	782	3.12441	3.26	3.5505	20.21	1.01228	21.5138	-18.34	60.840	6.3	56	438	1242.3	2048	218	627.9	1048	235	22
143	23	Pią	783	3.16406	3.22	3.5906	20.32	1.01248	22.4054	-14.01	61.690	0.4	46	436	1242.4	2050	237	715.6	1206	231	23
144	24	Sob	784	3.20372	3.17	4.0308	20.44	1.01267	23.2658	-9.00	62.406	1.4	36	435	1242.5	2051	251	759.5	1321	227	24
145	25	Nie	785	3.24337	3.11	4.0710	20.55	1.01286	0.1053	-3.45	62.966	2.4	27	434	1242.6	2052	303	840.9	1433	223	25
146	26	Pon	786	3.28303	3.05	4.1112	21.05	1.01304	0.5342	1.35	63.360	3.4	19	432	1242.7	2054	314	920.9	1543	219	26
147	27	Wto	787	3.32268	2.58	4.1516	21.16	1.01323	1.3623	6.48	63.594	4.4	12	431	1242.8	2055	324	1000.7	1654	215	27
148	28	Śro	788	3.36234	2.51	4.1919	21.26	1.01340	2.1951	11.46	63.680	5.4	7	430	1242.9	2056	336	1041.3	1805	211	28
149	29	Czw	789	3.40200	2.44	4.2323	21.35	1.01357	3.0454	16.19	63.634	6.4	3	429	1243.0	2058	349	1123.5	1917	207	29
150	30	Pią	790	3.44165	2.35	4.2728	21.44	1.01374	3.5209	20.16	63.474	7.4	1	428	1243.2	2059	405	1208.2	2029	203	30
151	31	Sob	791	3.48131	2.27	4.3133	21.53	1.01390	4.4158	23.24	63.217	0.2	0	427	1243.3	2100	426	1255.6	2141	159	31

Fazy Księżyca [Dm, h.mm]: Nów 1, 14.15 1kw 9, 13.53 Pełn 16, 5.36 3kw 23, 2.31 Nów 31, 6.20

MAJ 2003 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	2.34	22.57	5.22	21.11	4.37	17.16	2.39	10.51	11.06	2.52	7.36	0.14	3.28	13.30	2.45	11.42	22.36	8.19		
	2.547	15.01	3.104	19.28	0.765	3.13	20.558	-20.33	8.791	18.77	5.716	22.48	22.302	-11.35	21.041	-16.85	17.292	-13.42	14.56739	1
3	2.25	23.05	5.16	20.55	4.33	17.22	2.35	10.49	10.59	2.44	7.29	0.07	3.20	13.23	2.38	11.34	22.28	8.11		
	2.675	15.61	3.051	18.57	0.915	4.06	20.640	-20.10	8.803	18.72	5.731	22.49	22.305	-11.33	21.042	-16.85	17.290	-13.42	14.69881	3
5	2.16	23.14	5.10	20.38	4.29	17.28	2.30	10.48	10.52	2.37	7.22	23.56	3.13	13.15	2.30	11.27	22.20	8.03		
	2.803	16.19	2.986	17.75	1.064	4.98	20.721	-19.87	8.815	18.67	5.747	22.50	22.309	-11.31	21.042	-16.85	17.287	-13.41	14.83023	5
7	2.06	23.24	5.03	20.20	4.26	17.34	2.25	10.46	10.46	2.29	7.15	23.50	3.05	13.08	2.22	11.19	22.12	7.55		
	2.932	16.76	2.916	16.86	1.215	5.90	20.801	-19.63	8.827	18.62	5.763	22.51	22.312	-11.30	21.043	-16.84	17.284	-13.40	14.96165	7
9	1.55	23.36	4.57	20.02	4.22	17.40	2.21	10.45	10.39	2.22	7.08	23.43	2.57	13.00	2.14	11.11	22.04	7.47		
	3.061	17.30	2.845	15.95	1.365	6.81	20.880	-19.40	8.841	18.56	5.778	22.52	22.315	-11.28	21.044	-16.84	17.281	-13.40	15.09307	9
11	1.43	23.49	4.51	19.45	4.18	17.47	2.16	10.43	10.32	2.14	7.01	23.36	2.49	12.53	2.06	11.03	21.56	7.39		
	3.191	17.83	2.779	15.05	1.516	7.72	20.959	-19.15	8.855	18.51	5.795	22.53	22.318	-11.26	21.044	-16.84	17.278	-13.39	15.22449	11
13	1.29	0.14	4.45	19.28	4.14	17.53	2.11	10.42	10.26	2.07	6.54	23.29	2.41	12.45	1.58	10.55	21.48	7.31		
	3.322	18.33	2.723	14.22	1.668	8.61	21.037	-18.91	8.869	18.44	5.811	22.54	22.321	-11.25	21.044	-16.84	17.275	-13.39	15.35591	13
15	1.09	1.00	4.39	19.14	4.10	17.59	2.06	10.40	10.19	1.60	6.47	23.22	2.34	12.37	1.50	10.47	21.40	7.23		
	3.453	18.82	2.680	13.50	1.820	9.49	21.114	-18.66	8.884	18.38	5.828	22.55	22.323	-11.24	21.044	-16.84	17.272	-13.38	15.48733	15
17	****	****	4.33	19.01	4.07	18.05	2.01	10.38	10.13	1.52	6.40	23.16	2.26	12.30	1.43	10.40	21.32	7.15		
	3.585	19.28	2.652	12.91	1.973	10.36	21.190	-18.41	8.900	18.32	5.845	22.56	22.325	-11.23	21.044	-16.84	17.269	-13.38	15.61875	17
19	****	****	4.27	18.49	4.03	18.11	1.56	10.37	10.06	1.45	6.33	23.09	2.18	12.22	1.35	10.32	21.24	7.07		
	3.718	19.72	2.642	12.46	2.128	11.22	21.266	-18.16	8.917	18.25	5.862	22.56	22.327	-11.22	21.044	-16.84	17.266	-13.37	15.75017	19
21	****	****	4.21	18.40	3.60	18.18	1.51	10.35	9.60	1.38	6.26	23.02	2.10	12.14	1.27	10.24	21.16	6.59		
	3.851	20.14	2.649	12.18	2.283	12.05	21.340	-17.91	8.934	18.17	5.879	22.57	22.329	-11.21	21.044	-16.84	17.262	-13.37	15.88160	21
23	****	****	4.15	18.33	3.57	18.24	1.46	10.33	9.54	1.30	6.19	22.55	2.02	12.06	1.19	10.16	21.08	6.51		
	3.985	20.54	2.675	12.05	2.439	12.87	21.414	-17.66	8.951	18.10	5.896	22.58	22.331	-11.20	21.043	-16.85	17.259	-13.36	16.01302	23
25	****	****	4.10	18.28	3.53	18.30	1.41	10.31	9.47	1.23	6.12	22.48	1.55	11.59	1.11	10.08	20.59	6.42		
	4.119	20.91	2.718	12.07	2.596	13.67	21.486	-17.41	8.969	18.02	5.914	22.58	22.332	-11.19	21.043	-16.85	17.256	-13.36	16.14443	25
27	****	****	4.05	18.25	3.50	18.37	1.36	10.29	9.41	1.16	6.05	22.42	1.47	11.51	1.03	10.00	20.51	6.34		
	4.254	21.26	2.779	12.25	2.754	14.45	21.558	-17.16	8.988	17.95	5.931	22.59	22.334	-11.19	21.042	-16.85	17.252	-13.36	16.27585	27
29	****	****	3.60	18.24	3.47	18.43	1.31	10.27	9.35	1.08	5.59	22.35	1.39	11.43	0.55	9.52	20.43	6.26		
	4.390	21.58	2.857	12.56	2.913	15.21	21.628	-16.91	9.007	17.86	5.949	22.59	22.335	-11.18	21.041	-16.86	17.249	-13.35	16.40727	29
31	****	****	3.55	18.24	3.44	18.49	1.26	10.25	9.29	1.01	5.52	22.28	1.31	11.35	0.47	9.44	20.35	6.18		
	4.526	21.88	2.950	12.99	3.073	15.95	21.697	-16.67	9.027	17.78	5.967	22.60	22.335	-11.18	21.040	-16.86	17.245	-13.35	16.53869	31

CZERWIEC 2003

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]									
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2452																			
152	1	Nie	792	3.52096	2.18	4.3539	22.01	1.01405	5.3416	25.31	62.874	1.2	1	426	1243.4	2101	455	1345.8	2246	155	1	
153	2	Pon	793	3.56062	2.09	4.3945	22.10	1.01420	6.2830	26.27	62.453	2.2	5	425	1243.6	2103	535	1438.0	2342	151	2	
154	3	Wto	794	4.00028	1.59	4.4351	22.17	1.01435	7.2345	26.05	61.958	3.2	10	425	1243.8	2104	628	1531.3	****	147	3	
155	4	Śro	795	4.03593	1.49	4.4757	22.24	1.01449	8.1852	24.24	61.391	4.2	17	424	1243.9	2105	735	1624.2	026	143	4	
156	5	Czw	796	4.07559	1.39	4.5204	22.31	1.01462	9.1258	21.26	60.757	5.2	25	423	1244.1	2106	850	1715.9	058	140	5	
157	6	Pią	797	4.11524	1.28	4.5612	22.38	1.01475	10.0535	17.21	60.064	6.2	35	422	1244.3	2107	1011	1805.9	122	136	6	
158	7	Sob	798	4.15490	1.17	5.0019	22.44	1.01488	10.5650	12.19	59.333	7.2	45	422	1244.5	2108	1133	1854.5	141	132	7	
159	8	Nie	799	4.19455	1.06	5.0427	22.50	1.01500	11.4716	6.35	58.593	0.6	56	421	1244.7	2109	1256	1942.4	156	128	8	
160	9	Pon	800	4.23421	0.54	5.0835	22.55	1.01511	12.3747	0.23	57.888	1.6	67	421	1244.8	2109	1421	2030.8	210	124	9	
161	10	Wto	801	4.27387	0.43	5.1243	22.60	1.01523	13.2927	-5.60	57.273	2.6	78	420	1245.0	2110	1548	2121.0	223	120	10	
162	11	Śro	802	4.31352	0.31	5.1652	23.04	1.01533	14.2325	-12.11	56.808	3.6	87	420	1245.2	2111	1719	2214.1	238	116	11	
163	12	Czw	803	4.35318	0.18	5.2100	23.08	1.01544	15.2039	-17.45	56.549	4.6	94	419	1245.4	2112	1852	2311.2	255	112	12	
164	13	Pią	804	4.39283	0.06	5.2509	23.12	1.01554	16.2133	-22.15	56.535	5.6	98	419	1245.6	2112	2026	*****	318	108	13	
165	14	Sob	805	4.43249	-0.06	5.2918	23.15	1.01564	17.2533	-25.15	56.785	6.6	100	419	1245.9	2113	2150	012.4	351	104	14	
166	15	Nie	806	4.47215	-0.19	5.3327	23.18	1.01574	18.3054	-26.27	57.286	0.9	99	419	1246.1	2114	2258	116.1	439	100	15	
167	16	Pon	807	4.51180	-0.32	5.3737	23.20	1.01583	19.3509	-25.50	57.996	1.9	95	419	1246.3	2114	2346	219.9	543	056	16	
168	17	Wto	808	4.55146	-0.45	5.4146	23.22	1.01592	20.3605	-23.34	58.853	2.9	89	419	1246.5	2115	****	320.8	701	052	17	
169	18	Śro	809	4.59111	-0.57	5.4556	23.24	1.01601	21.3232	-20.01	59.784	3.9	81	419	1246.7	2115	019	417.0	825	048	18	
170	19	Czw	810	5.03077	-1.10	5.5005	23.25	1.01609	22.2427	-15.34	60.713	4.9	72	419	1246.9	2115	041	508.1	946	045	19	
171	20	Pią	811	5.07043	-1.23	5.5415	23.26	1.01617	23.1232	-10.34	61.573	5.9	62	419	1247.1	2116	058	554.6	1104	041	20	
172	21	Sob	812	5.11008	-1.37	5.5824	23.26	1.01625	23.5747	-5.16	62.311	6.9	52	419	1247.4	2116	111	637.7	1219	037	21	
173	22	Nie	813	5.14574	-1.50	6.0234	23.26	1.01632	0.4119	0.07	62.888	0.8	42	419	1247.6	2116	122	718.7	1331	033	22	
174	23	Pon	814	5.18539	-2.03	6.0644	23.26	1.01638	1.2413	5.25	63.285	1.8	33	419	1247.8	2116	132	758.8	1441	029	23	
175	24	Wto	815	5.22505	-2.16	6.1053	23.25	1.01644	2.0730	10.28	63.495	2.8	24	420	1248.0	2116	143	839.1	1552	025	24	
176	25	Śro	816	5.26470	-2.28	6.1503	23.24	1.01650	2.5204	15.09	63.527	3.8	17	420	1248.2	2116	156	920.7	1704	021	25	
177	26	Czw	817	5.30436	-2.41	6.1912	23.22	1.01655	3.3842	19.16	63.399	4.8	10	420	1248.4	2116	211	1004.5	1816	017	26	
178	27	Pią	818	5.34402	-2.54	6.2321	23.20	1.01659	4.2753	22.38	63.138	5.8	5	421	1248.6	2116	230	1051.0	1929	013	27	
179	28	Sob	819	5.38367	-3.06	6.2730	23.17	1.01663	5.1947	25.03	62.772	6.8	2	421	1248.9	2116	256	1140.4	2037	009	28	
180	29	Nie	820	5.42333	-3.19	6.3139	23.14	1.01666	6.1360	26.18	62.330	7.8	0	422	1249.1	2116	333	1232.6	2137	005	29	
181	30	Pon	821	5.46299	-3.31	6.3548	23.11	1.01669	7.0938	26.16	61.838	0.6	0	423	1249.3	2116	422	1326.3	2225	001	30	

Fazy Księżyca [Dm, h.mm]: 1kw 7, 22.28 Pełn 14, 13.16 3kw 21, 16.45 Nów 29, 20.39

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Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	****	****	3.53	18.25	3.43	18.52	1.23	10.24	9.26	0.58	5.48	22.25	1.27	11.32	0.44	9.40	20.31	6.14		
	4.594	22.02	3.003	13.25	3.154	16.30	21.732	-16.55	9.037	17.74	5.976	22.60	22.336	-11.18	21.040	-16.86	17.243	-13.35	16.60441	1
3	****	****	3.48	18.27	3.40	18.59	1.18	10.21	9.20	0.50	5.42	22.18	1.19	11.24	0.36	9.32	20.23	6.06		
	4.731	22.29	3.120	13.84	3.316	17.00	21.799	-16.31	9.057	17.65	5.995	22.61	22.336	-11.18	21.038	-16.87	17.240	-13.35	16.73583	3
5	****	****	3.44	18.32	3.38	19.05	1.12	10.19	9.14	0.43	5.35	22.11	1.12	11.16	0.28	9.24	20.15	5.58		
	4.868	22.52	3.252	14.53	3.480	17.66	21.865	-16.07	9.078	17.56	6.013	22.61	22.337	-11.18	21.037	-16.88	17.236	-13.35	16.86725	5
7	****	****	3.40	18.37	3.36	19.11	1.07	10.16	9.08	0.36	5.28	22.05	1.04	11.08	0.20	9.16	20.07	5.50		
	5.005	22.73	3.399	15.29	3.644	18.30	21.930	-15.83	9.099	17.47	6.031	22.61	22.337	-11.18	21.036	-16.88	17.233	-13.34	16.99867	7
9	****	****	3.37	18.44	3.34	19.17	1.01	10.14	9.02	0.29	5.21	21.58	0.56	11.00	0.12	9.08	19.59	5.42		
	5.143	22.91	3.560	16.11	3.810	18.91	21.994	-15.60	9.121	17.37	6.050	22.61	22.337	-11.18	21.034	-16.89	17.229	-13.34	17.13009	9
11	****	****	3.34	18.52	3.32	19.23	0.56	10.11	8.56	0.22	5.14	21.51	0.48	10.52	0.04	9.00	19.51	5.34		
	5.281	23.07	3.735	16.98	3.977	19.48	22.056	-15.38	9.143	17.27	6.068	22.62	22.336	-11.18	21.032	-16.90	17.226	-13.34	17.26151	11
13	****	****	3.32	19.02	3.30	19.29	0.50	10.08	8.50	0.14	5.08	21.44	0.40	10.44	23.52	8.52	19.43	5.26		
	5.419	23.20	3.926	17.88	4.145	20.02	22.117	-15.16	9.165	17.18	6.087	22.62	22.336	-11.19	21.030	-16.91	17.222	-13.34	17.39293	13
15	****	****	3.30	19.12	3.29	19.35	0.45	10.05	8.44	0.07	5.01	21.38	0.32	10.36	23.44	8.44	19.35	5.18		
	5.558	23.30	4.132	18.80	4.315	20.52	22.176	-14.95	9.188	17.07	6.106	22.62	22.335	-11.19	21.028	-16.91	17.218	-13.34	17.52436	15
17	****	****	3.29	19.24	3.28	19.41	0.39	10.02	8.38	23.56	4.54	21.31	0.24	10.28	23.36	8.36	19.26	5.10		
	5.696	23.37	4.354	19.72	4.485	20.99	22.234	-14.75	9.211	16.97	6.124	22.62	22.334	-11.20	21.026	-16.92	17.215	-13.34	17.65578	17
19	****	****	3.29	19.37	3.27	19.46	0.33	9.58	8.32	23.49	4.47	21.24	0.16	10.20	23.28	8.28	19.18	5.02		
	5.835	23.42	4.591	20.62	4.657	21.42	22.290	-14.55	9.234	16.87	6.143	22.62	22.333	-11.21	21.024	-16.93	17.211	-13.34	17.78720	19
21	****	****	3.30	19.50	3.27	19.52	0.28	9.55	8.27	23.42	4.41	21.17	0.09	10.12	23.20	8.20	19.10	4.54		
	5.973	23.44	4.844	21.47	4.830	21.81	22.344	-14.36	9.258	16.76	6.162	22.62	22.332	-11.21	21.022	-16.94	17.208	-13.34	17.91862	21
23	****	****	3.33	20.04	3.27	19.57	0.22	9.51	8.21	23.35	4.34	21.11	23.57	10.04	23.12	8.12	19.02	4.45		
	6.112	23.43	5.113	22.25	5.003	22.16	22.397	-14.19	9.282	16.65	6.181	22.61	22.330	-11.22	21.019	-16.95	17.204	-13.34	18.05004	23
25	****	****	3.37	20.18	3.27	20.02	0.16	9.47	8.15	23.28	4.27	21.04	23.49	9.56	23.04	8.04	18.54	4.37		
	6.251	23.40	5.396	22.94	5.178	22.47	22.448	-14.02	9.307	16.54	6.199	22.61	22.329	-11.23	21.017	-16.97	17.201	-13.35	18.18146	25
27	****	****	3.42	20.33	3.28	20.06	0.10	9.43	8.10	23.21	4.21	20.57	23.41	9.48	22.57	7.56	18.46	4.29		
	6.389	23.33	5.692	23.51	5.353	22.73	22.496	-13.86	9.331	16.42	6.218	22.61	22.327	-11.25	21.014	-16.98	17.197	-13.35	18.31288	27
29	****	****	3.49	20.47	3.29	20.11	0.04	9.39	8.04	23.13	4.14	20.50	23.33	9.40	22.49	7.48	18.38	4.21		
	6.528	23.24	5.999	23.93	5.530	22.96	22.543	-13.72	9.356	16.31	6.237	22.61	22.325	-11.26	21.011	-16.99	17.194	-13.35	18.44431	29

LIPIEC 2003

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
182	1	Wto	822	5.50264	-3.43	6.3956	23.07	1.01671	8.0528	24.51	61.316	1.6	3	423	1249.5	2115	525	1420.1	2301	2353	1
183	2	Śro	823	5.54230	-3.54	6.4404	23.03	1.01672	9.0022	22.09	60.779	2.6	7	424	1249.7	2115	639	1512.7	2328	2349	2
184	3	Czw	824	5.58195	-4.06	6.4812	22.59	1.01673	9.5338	18.16	60.235	3.6	14	425	1249.8	2114	759	1603.5	2348	2346	3
185	4	Pią	825	6.02161	-4.17	6.5220	22.54	1.01673	10.4508	13.25	59.692	4.6	22	426	1250.0	2114	921	1652.4	****	2342	4
186	5	Sob	826	6.06126	-4.27	6.5627	22.48	1.01672	11.3517	7.51	59.157	5.6	31	426	1250.2	2113	1044	1739.9	004	2338	5
187	6	Nie	827	6.10092	-4.38	7.0034	22.43	1.01672	12.2452	1.50	58.642	6.6	42	427	1250.4	2113	1206	1827.0	017	2334	6
188	7	Pon	828	6.14057	-4.48	7.0441	22.36	1.01670	13.1457	-4.23	58.165	0.3	54	428	1250.5	2112	1330	1915.1	030	2330	7
189	8	Wto	829	6.18023	-4.57	7.0847	22.30	1.01668	14.0640	-10.28	57.754	1.3	65	429	1250.7	2112	1457	2005.3	044	2326	8
190	9	Śro	830	6.21589	-5.07	7.1252	22.23	1.01666	15.0107	-16.06	57.444	2.3	75	430	1250.9	2111	1626	2058.9	059	2322	9
191	10	Czw	831	6.25554	-5.15	7.1658	22.16	1.01663	15.5902	-20.51	57.272	3.3	85	431	1251.0	2110	1757	2156.6	119	2318	10
192	11	Pią	832	6.29520	-5.24	7.2102	22.08	1.01660	17.0028	-24.20	57.273	4.3	92	432	1251.1	2109	1925	2257.8	146	2314	11
193	12	Sob	833	6.33485	-5.31	7.2507	21.60	1.01657	18.0424	-26.12	57.468	5.3	97	434	1251.3	2108	2040	*****	226	2310	12
194	13	Nie	834	6.37451	-5.39	7.2911	21.52	1.01653	19.0847	-26.16	57.861	6.3	100	435	1251.4	2107	2137	001.0	322	2306	13
195	14	Pon	835	6.41417	-5.46	7.3314	21.43	1.01649	20.1116	-24.37	58.436	0.6	100	436	1251.5	2106	2216	103.3	434	2302	14
196	15	Wto	836	6.45382	-5.52	7.3717	21.34	1.01645	21.1004	-21.29	59.154	1.6	97	437	1251.6	2105	2243	202.2	557	2258	15
197	16	Śro	837	6.49348	-5.58	7.4120	21.24	1.01640	22.0429	-17.16	59.959	2.6	92	438	1251.7	2104	2302	256.4	721	2254	16
198	17	Czw	838	6.53313	-6.03	7.4522	21.14	1.01635	22.5448	-12.20	60.790	3.6	85	440	1251.8	2103	2316	345.8	842	2250	17
199	18	Pią	839	6.57279	-6.08	7.4923	21.04	1.01629	23.4148	-6.60	61.581	4.6	77	441	1251.9	2102	2328	431.2	1000	2247	18
200	19	Sob	840	7.01244	-6.13	7.5324	20.53	1.01623	0.2632	-1.31	62.276	5.6	68	442	1252.0	2101	2339	513.8	1114	2243	19
201	20	Nie	841	7.05210	-6.17	7.5724	20.42	1.01617	1.1006	3.53	62.826	6.6	58	444	1252.0	2059	2350	554.8	1226	2239	20
202	21	Pon	842	7.09175	-6.20	8.0124	20.31	1.01610	1.5332	9.05	63.199	0.1	49	445	1252.1	2058	****	635.3	1337	2235	21
203	22	Wto	843	7.13141	-6.23	8.0524	20.19	1.01603	2.3748	13.55	63.378	1.1	39	447	1252.1	2057	002	716.5	1449	2231	22
204	23	Śro	844	7.17107	-6.25	8.0922	20.07	1.01596	3.2346	18.12	63.359	2.1	30	448	1252.2	2055	016	759.4	1601	2227	23
205	24	Czw	845	7.21072	-6.26	8.1321	19.55	1.01587	4.1206	21.48	63.157	3.1	22	450	1252.2	2054	033	844.8	1714	2223	24
206	25	Pią	846	7.25038	-6.28	8.1718	19.42	1.01579	5.0309	24.31	62.795	4.1	15	451	1252.2	2052	056	933.2	1824	2219	25
207	26	Sob	847	7.29003	-6.28	8.2115	19.29	1.01569	5.5648	26.07	62.310	5.1	8	453	1252.2	2051	129	1024.5	1928	2215	26
208	27	Nie	848	7.32569	-6.28	8.2512	19.16	1.01560	6.5223	26.27	61.742	6.1	4	454	1252.2	2049	213	1117.9	2021	2211	27
209	28	Pon	849	7.36535	-6.27	8.2908	19.02	1.01549	7.4847	25.24	61.133	7.1	1	456	1252.2	2048	312	1212.4	2101	2207	28
210	29	Wto	850	7.40500	-6.26	8.3303	18.48	1.01538	8.4444	22.60	60.524	0.1	0	457	1252.2	2046	424	1306.3	2131	2203	29
211	30	Śro	851	7.44466	-6.24	8.3658	18.34	1.01527	9.3919	19.19	59.949	1.1	1	459	1252.2	2044	544	1358.7	2153	2159	30
212	31	Czw	852	7.48431	-6.22	8.4052	18.19	1.01515	10.3205	14.35	59.433	2.1	5	500	1252.1	2043	707	1449.0	2210	2155	31

Fazy Księżyca [Dm, h.mm]: 1kw 7, 4.32 Pełn 13, 21.21 3kw 21, 9.01 Nów 29, 8.53

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Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	*****	*****	3.58	20.60	3.30	20.15	23.54	9.35	7.58	23.06	4.07	20.44	23.25	9.32	22.41	7.39	18.30	4.13		
	6.666	23.12	6.313	24.19	5.706	23.13	22.588	-13.59	9.381	16.19	6.256	22.60	22.323	-11.27	21.009	-17.00	17.191	-13.35	18.57573	1
3	*****	*****	4.09	21.11	3.32	20.19	23.48	9.30	7.53	22.59	4.00	20.37	23.17	9.24	22.33	7.31	18.22	4.05		
	6.803	22.98	6.632	24.26	5.884	23.27	22.630	-13.47	9.407	16.07	6.274	22.60	22.320	-11.29	21.006	-17.01	17.187	-13.36	18.70715	3
5	*****	*****	4.21	21.22	3.34	20.22	23.42	9.25	7.47	22.52	3.54	20.30	23.09	9.16	22.25	7.23	18.14	3.57		
	6.941	22.81	6.950	24.14	6.061	23.36	22.670	-13.36	9.433	15.95	6.293	22.59	22.318	-11.30	21.003	-17.03	17.184	-13.36	18.83857	5
7	*****	*****	4.34	21.30	3.36	20.25	23.36	9.20	7.42	22.45	3.47	20.23	23.01	9.08	22.17	7.15	18.06	3.49		
	7.078	22.61	7.265	23.85	6.239	23.40	22.707	-13.27	9.459	15.83	6.312	22.59	22.315	-11.32	21.000	-17.04	17.181	-13.36	18.96999	7
9	*****	*****	4.48	21.37	3.39	20.28	23.30	9.15	7.36	22.38	3.40	20.16	22.53	8.60	22.09	7.07	17.58	3.41		
	7.215	22.38	7.573	23.38	6.417	23.40	22.742	-13.19	9.485	15.70	6.330	22.58	22.312	-11.34	20.996	-17.05	17.178	-13.37	19.10141	9
11	*****	*****	5.03	21.42	3.42	20.30	23.24	9.09	7.31	22.31	3.34	20.10	22.45	8.52	22.01	6.59	17.50	3.33		
	7.351	22.13	7.872	22.74	6.595	23.35	22.775	-13.13	9.511	15.57	6.349	22.57	22.309	-11.36	20.993	-17.07	17.175	-13.37	19.23283	11
13	*****	*****	5.19	21.46	3.46	20.32	23.17	9.03	7.25	22.24	3.27	20.03	22.38	8.43	21.53	6.51	17.42	3.25		
	7.486	21.86	8.161	21.97	6.773	23.26	22.804	-13.08	9.537	15.45	6.367	22.56	22.305	-11.38	20.990	-17.08	17.172	-13.38	19.36426	13
15	*****	*****	5.34	21.48	3.50	20.34	23.11	8.57	7.20	22.17	3.20	19.56	22.30	8.35	21.45	6.43	17.34	3.17		
	7.621	21.56	8.438	21.08	6.950	23.12	22.831	-13.05	9.564	15.32	6.385	22.56	22.302	-11.40	20.987	-17.10	17.169	-13.39	19.49568	15
17	*****	*****	5.49	21.49	3.54	20.35	23.04	8.51	7.14	22.10	3.13	19.49	22.22	8.27	21.37	6.34	17.26	3.09		
	7.756	21.23	8.703	20.08	7.128	22.93	22.855	-13.04	9.591	15.19	6.403	22.55	22.299	-11.42	20.983	-17.11	17.166	-13.39	19.62710	17
19	*****	*****	6.04	21.48	3.58	20.36	22.58	8.44	7.09	22.03	3.07	19.42	22.14	8.19	21.29	6.26	17.18	3.00		
	7.890	20.89	8.956	19.00	7.305	22.70	22.876	-13.04	9.618	15.05	6.421	22.54	22.295	-11.44	20.980	-17.12	17.164	-13.40	19.75852	19
21	*****	*****	6.18	21.47	4.03	20.37	22.51	8.37	7.03	21.56	2.60	19.35	22.06	8.11	21.21	6.18	17.10	2.52		
	8.023	20.51	9.196	17.85	7.481	22.43	22.894	-13.06	9.645	14.92	6.439	22.53	22.291	-11.46	20.976	-17.14	17.161	-13.40	19.88993	21
23	*****	*****	6.32	21.45	4.08	20.37	22.44	8.30	6.58	21.49	2.53	19.29	21.58	8.02	21.13	6.10	17.02	2.44		
	8.156	20.12	9.425	16.64	7.656	22.11	22.909	-13.10	9.672	14.78	6.457	22.52	22.287	-11.49	20.973	-17.15	17.159	-13.41	20.02135	23
25	*****	*****	6.45	21.43	4.13	20.37	22.37	8.23	6.53	21.41	2.47	19.22	21.50	7.54	21.05	6.02	16.54	2.36		
	8.288	19.70	9.642	15.39	7.831	21.75	22.920	-13.16	9.700	14.65	6.475	22.51	22.283	-11.51	20.969	-17.17	17.156	-13.42	20.15278	25
27	*****	*****	6.57	21.39	4.19	20.37	22.30	8.15	6.47	21.34	2.40	19.15	21.42	7.46	20.57	5.54	16.46	2.28		
	8.420	19.26	9.848	14.12	8.005	21.34	22.928	-13.23	9.727	14.51	6.492	22.50	22.279	-11.53	20.966	-17.19	17.154	-13.43	20.28420	27
29	1.01	0.03	7.08	21.35	4.25	20.36	22.23	8.07	6.42	21.27	2.33	19.08	21.34	7.38	20.49	5.45	16.38	2.20		
	8.551	18.80	10.044	12.82	8.178	20.90	22.932	-13.32	9.755	14.37	6.510	22.49	22.274	-11.56	20.962	-17.20	17.152	-13.44	20.41562	29
31	1.31	-0.03	7.19	21.31	4.31	20.35	22.16	7.58	6.37	21.20	2.26	19.01	21.26	7.29	20.41	5.37	16.30	2.12		
	8.681	18.32	10.230	11.52	8.351	20.41	22.933	-13.42	9.783	14.23	6.527	22.48	22.270	-11.59	20.958	-17.22	17.150	-13.44	20.54704	31

SIERPIEŃ 2003

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)											Czas strefowy [hhmm.]							
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
2452																					
213	1	Pią	853	7.52397	-6.19	8.4445	18.04	1.01502	11.2312	9.04	58.989	3.1	11	502	1252.1	2041	831	1537.6	2225	2152	1
214	2	Sob	854	7.56362	-6.15	8.4838	17.49	1.01489	12.1319	3.02	58.623	4.1	19	504	1252.0	2039	955	1625.2	2238	2148	2
215	3	Nie	855	8.00328	-6.11	8.5230	17.34	1.01475	13.0321	-3.12	58.334	5.1	29	505	1251.9	2037	1119	1712.9	2251	2144	3
216	4	Pon	856	8.04293	-6.06	8.5622	17.18	1.01461	13.5421	-9.19	58.120	6.1	40	507	1251.8	2036	1244	1802.0	2305	2140	4
217	5	Wto	857	8.08259	-5.60	9.0013	17.02	1.01446	14.4723	-15.00	57.982	0.1	51	509	1251.7	2034	1411	1853.6	2323	2136	5
218	6	Śro	858	8.12224	-5.54	9.0403	16.45	1.01431	15.4317	-19.54	57.923	1.1	63	510	1251.6	2032	1540	1948.5	2347	2132	6
219	7	Czw	859	8.16190	-5.47	9.0753	16.29	1.01416	16.4223	-23.39	57.955	2.1	73	512	1251.5	2030	1707	2047.0	****	2128	7
220	8	Pią	860	8.20156	-5.39	9.1142	16.12	1.01400	17.4409	-25.56	58.090	3.1	83	514	1251.4	2028	1825	2148.0	020	2124	8
221	9	Sob	861	8.24121	-5.31	9.1530	15.55	1.01384	18.4707	-26.32	58.341	4.1	91	515	1251.3	2026	1928	2249.4	108	2120	9
222	10	Nie	862	8.28087	-5.23	9.1918	15.38	1.01367	19.4914	-25.26	58.713	5.1	96	517	1251.1	2024	2013	2348.8	213	2116	10
223	11	Pon	863	8.32053	-5.14	9.2306	15.20	1.01351	20.4839	-22.47	59.205	6.1	99	519	1251.0	2022	2043	*****	332	2112	11
224	12	Wto	864	8.36018	-5.04	9.2652	15.02	1.01334	21.4419	-18.54	59.797	0.2	100	520	1250.8	2020	2105	044.5	455	2108	12
225	13	Śro	865	8.39584	-4.53	9.3039	14.44	1.01316	22.3604	-14.08	60.460	1.2	98	522	1250.6	2018	2121	135.9	619	2104	13
226	14	Czw	866	8.43549	-4.42	9.3424	14.26	1.01299	23.2426	-8.51	61.151	2.2	94	524	1250.5	2016	2134	223.1	738	2100	14
227	15	Pią	867	8.47515	-4.31	9.3809	14.07	1.01281	0.1017	-3.19	61.820	3.2	89	525	1250.3	2014	2145	307.2	855	2056	15
228	16	Sob	868	8.51480	-4.19	9.4154	13.48	1.01263	0.5437	2.13	62.418	4.2	82	527	1250.1	2012	2156	349.2	1009	2053	16
229	17	Nie	869	8.55446	-4.07	9.4538	13.29	1.01245	1.3824	7.35	62.897	5.2	74	529	1249.9	2010	2207	430.2	1121	2049	17
230	18	Pon	870	8.59411	-3.54	9.4922	13.10	1.01227	2.2235	12.35	63.219	6.2	65	530	1249.6	2008	2220	511.4	1233	2045	18
231	19	Wto	871	9.03377	-3.40	9.5305	12.51	1.01208	3.0803	17.06	63.354	7.2	56	532	1249.4	2005	2236	553.7	1346	2041	19
232	20	Śro	872	9.07342	-3.26	9.5647	12.31	1.01189	3.5531	20.56	63.290	0.4	46	534	1249.2	2003	2256	638.0	1458	2037	20
233	21	Czw	873	9.11308	-3.12	10.0029	12.11	1.01169	4.4527	23.56	63.028	1.4	37	536	1248.9	2001	2324	725.0	1610	2033	21
234	22	Pią	874	9.15273	-2.57	10.0411	11.51	1.01149	5.3759	25.54	62.585	2.4	28	537	1248.7	1959	****	814.8	1716	2029	22
235	23	Sob	875	9.19239	-2.42	10.0752	11.31	1.01129	6.3242	26.39	61.992	3.4	20	539	1248.4	1957	003	907.1	1813	2025	23
236	24	Nie	876	9.23205	-2.26	10.1133	11.11	1.01108	7.2847	26.03	61.294	4.4	12	541	1248.2	1954	056	1001.1	1858	2021	24
237	25	Pon	877	9.27170	-2.10	10.1514	10.50	1.01087	8.2505	24.04	60.543	5.4	6	542	1247.9	1952	203	1055.5	1932	2017	25
238	26	Wto	878	9.31136	-1.53	10.1854	10.29	1.01066	9.2035	20.45	59.798	6.4	2	544	1247.6	1950	321	1149.0	1957	2013	26
239	27	Śro	879	9.35101	-1.36	10.2233	10.08	1.01044	10.1438	16.14	59.112	7.4	0	546	1247.4	1948	445	1240.9	2016	2009	27
240	28	Czw	880	9.39067	-1.19	10.2613	9.47	1.01021	11.0709	10.47	58.535	0.7	1	548	1247.1	1945	611	1331.1	2031	2005	28
241	29	Pią	881	9.43032	-1.01	10.2952	9.26	1.00998	11.5835	4.42	58.098	1.7	4	549	1246.8	1943	737	1420.1	2044	2001	29
242	30	Sob	882	9.46598	-0.43	10.3330	9.05	1.00975	12.4939	-1.42	57.819	2.7	9	551	1246.5	1941	903	1508.9	2057	1957	30
243	31	Nie	883	9.50563	-0.25	10.3708	8.43	1.00951	13.4120	-8.03	57.695	3.7	17	553	1246.2	1938	1030	1558.5	2111	1954	31

Fazy Księżyca [Dm, h.mm]: 1kw 5, 9.28 Pełn 12, 6.48 3kw 20, 2.48 Nów 27, 19.26

WRZESIEŃ 2003

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
244	1	Pon	884	9.54529	-0.06	10.4046	8.22	1.00927	14.3437	-13.59	57.712	4.7	27	554	1245.9	1936	1158	1650.0	2128	1950	1
245	2	Wto	885	9.58494	0.13	10.4424	7.60	1.00903	15.3016	-19.08	57.846	5.7	37	556	1245.5	1934	1328	1744.2	2150	1946	2
246	3	Śro	886	10.02460	0.32	10.4801	7.38	1.00878	16.2839	-23.10	58.074	6.7	49	558	1245.2	1931	1456	1841.6	2219	1942	3
247	4	Czw	887	10.06425	0.52	10.5138	7.16	1.00853	17.2925	-25.46	58.375	0.9	60	600	1244.9	1929	1617	1941.3	2302	1938	4
248	5	Pią	888	10.10391	1.12	10.5514	6.54	1.00828	18.3120	-26.45	58.733	1.9	71	601	1244.6	1927	1724	2041.7	****	1934	5
249	6	Sob	889	10.14357	1.32	10.5851	6.31	1.00802	19.3242	-26.03	59.141	2.9	80	603	1244.2	1924	1813	2140.7	001	1930	6
250	7	Nie	890	10.18322	1.52	11.0227	6.09	1.00777	20.3146	-23.48	59.594	3.9	88	605	1243.9	1922	1847	2236.6	114	1926	7
251	8	Pon	891	10.22288	2.13	11.0603	5.46	1.00751	21.2730	-20.17	60.090	4.9	94	606	1243.5	1919	1910	2328.5	235	1922	8
252	9	Wto	892	10.26253	2.33	11.0939	5.24	1.00725	22.1937	-15.46	60.621	5.9	98	608	1243.2	1917	1927	*****	358	1918	9
253	10	Śro	893	10.30219	2.54	11.1314	5.01	1.00699	23.0828	-10.38	61.177	6.9	100	610	1242.8	1915	1941	016.6	519	1914	10
254	11	Czw	894	10.34184	3.15	11.1650	4.38	1.00673	23.5448	-5.07	61.735	0.7	99	612	1242.5	1912	1952	101.4	636	1910	11
255	12	Pią	895	10.38150	3.37	11.2025	4.16	1.00647	0.3929	0.29	62.268	1.7	97	613	1242.1	1910	2003	144.0	751	1906	12
256	13	Sob	896	10.42115	3.58	11.2401	3.53	1.00621	1.2328	5.59	62.743	2.7	93	615	1241.8	1907	2013	225.4	904	1902	13
257	14	Nie	897	10.46081	4.19	11.2736	3.30	1.00594	2.0737	11.11	63.121	3.7	87	617	1241.4	1905	2025	306.5	1017	1859	14
258	15	Pon	898	10.50046	4.41	11.3111	3.07	1.00568	2.5244	15.54	63.368	4.7	80	618	1241.1	1903	2039	348.5	1130	1855	15
259	16	Wto	899	10.54012	5.02	11.3446	2.44	1.00542	3.3931	20.00	63.453	5.7	72	620	1240.7	1900	2057	432.0	1243	1851	16
260	17	Śro	900	10.57577	5.24	11.3821	2.21	1.00515	4.2828	23.17	63.353	6.7	63	622	1240.4	1858	2121	517.7	1355	1847	17
261	18	Czw	901	11.01543	5.45	11.4156	1.57	1.00489	5.1947	25.36	63.059	7.7	54	624	1240.0	1855	2155	606.0	1504	1843	18
262	19	Pią	902	11.05509	6.06	11.4531	1.34	1.00462	6.1313	26.46	62.573	0.6	44	625	1239.6	1853	2241	656.8	1604	1839	19
263	20	Sob	903	11.09474	6.28	11.4907	1.11	1.00435	7.0811	26.39	61.917	1.6	34	627	1239.3	1851	2342	749.5	1654	1835	20
264	21	Nie	904	11.13440	6.49	11.5242	0.47	1.00408	8.0346	25.10	61.126	2.6	25	629	1238.9	1848	****	843.0	1731	1831	21
265	22	Pon	905	11.17405	7.10	11.5617	0.24	1.00380	8.5901	22.21	60.254	3.6	17	630	1238.6	1846	055	936.3	1759	1827	22
266	23	Wto	906	11.21371	7.31	11.5953	0.01	1.00353	9.5317	18.16	59.364	4.6	9	632	1238.2	1843	216	1028.5	1820	1823	23
267	24	Śro	907	11.25336	7.52	12.0328	-0.23	1.00325	10.4624	13.06	58.527	5.6	4	634	1237.9	1841	342	1119.5	1836	1819	24
268	25	Czw	908	11.29302	8.13	12.0704	-0.46	1.00297	11.3838	7.07	57.812	6.6	1	636	1237.5	1838	509	1209.5	1850	1815	25
269	26	Pią	909	11.33267	8.34	12.1040	-1.09	1.00269	12.3036	0.37	57.280	0.3	0	637	1237.2	1836	636	1259.2	1903	1811	26
270	27	Sob	910	11.37233	8.54	12.1416	-1.33	1.00240	13.2313	-5.60	56.968	1.3	2	639	1236.8	1834	805	1349.6	1917	1807	27
271	28	Nie	911	11.41198	9.14	12.1753	-1.56	1.00212	14.1724	-12.20	56.890	2.3	7	641	1236.5	1831	936	1441.9	1932	1803	28
272	29	Pon	912	11.45164	9.34	12.2129	-2.19	1.00183	15.1356	-17.57	57.035	3.3	15	643	1236.2	1829	1109	1536.8	1952	1800	29
273	30	Wto	913	11.49129	9.54	12.2506	-2.43	1.00154	16.1310	-22.28	57.368	4.3	24	644	1235.8	1826	1242	1634.8	2019	1756	30

Fazy Księżyca [Dm, h.mm]: 1kw 3, 14.34 Pełn 10, 18.36 3kw 18, 21.03 Now 26, 5.09

WRZESIEŃ 2003 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE			MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)		
1	3.42	21.48	7.51	19.33	6.15	19.50	20.04	5.14	5.12	19.27	0.37	17.08	19.18	5.16	18.33	3.27	14.25	0.04			
	10.679	8.36	11.613	-2.26	10.950	8.25	22.561	-16.07	10.229	11.86	6.768	22.27	22.191	-12.03	20.903	-17.45	17.135	-13.63	22.64975	1	
3	3.48	21.41	7.38	19.23	6.22	19.46	19.55	5.04	5.06	19.20	0.29	17.01	19.10	5.08	18.25	3.18	14.17	23.53			
	10.800	7.63	11.552	-1.91	11.104	7.29	22.526	-16.18	10.257	11.71	6.781	22.26	22.186	-12.06	20.900	-17.47	17.135	-13.64	22.78117	3	
5	3.53	21.35	7.22	19.14	6.28	19.42	19.45	4.53	5.01	19.13	0.22	16.54	19.02	4.60	18.17	3.10	14.09	23.45			
	10.921	6.89	11.470	-1.32	11.257	6.32	22.493	-16.28	10.285	11.56	6.793	22.24	22.181	-12.09	20.896	-17.48	17.135	-13.66	22.91259	5	
7	3.58	21.29	7.04	19.04	6.35	19.38	19.36	4.43	4.56	19.06	0.15	16.46	18.54	4.51	18.09	3.02	14.01	23.37			
	11.041	6.15	11.371	-0.49	11.410	5.34	22.460	-16.36	10.312	11.40	6.805	22.23	22.176	-12.11	20.894	-17.49	17.136	-13.67	23.04401	7	
9	4.03	21.23	6.44	18.55	6.42	19.34	19.27	4.33	4.50	18.59	0.08	16.39	18.46	4.43	18.02	2.54	13.54	23.29			
	11.161	5.40	11.261	0.55	11.562	4.35	22.429	-16.42	10.340	11.25	6.816	22.22	22.171	-12.14	20.891	-17.50	17.137	-13.68	23.17543	9	
11	4.08	21.16	6.23	18.47	6.48	19.29	19.17	4.23	4.45	18.52	23.57	16.32	18.38	4.35	17.54	2.46	13.46	23.21			
	11.281	4.64	11.150	1.73	11.714	3.35	22.400	-16.46	10.367	11.10	6.827	22.21	22.167	-12.16	20.888	-17.51	17.137	-13.70	23.30685	11	
13	4.12	21.10	6.02	18.40	6.55	19.25	19.08	4.14	4.39	18.45	23.50	16.24	18.30	4.26	17.46	2.38	13.38	23.13			
	11.400	3.88	11.046	2.96	11.865	2.34	22.374	-16.47	10.394	10.95	6.838	22.19	22.162	-12.19	20.885	-17.53	17.138	-13.71	23.43826	13	
15	4.17	21.05	5.43	18.33	7.01	19.21	18.59	4.04	4.34	18.37	23.43	16.17	18.22	4.18	17.38	2.30	13.30	23.05			
	11.520	3.11	10.962	4.16	12.016	1.33	22.349	-16.47	10.421	10.80	6.848	22.18	22.157	-12.22	20.883	-17.54	17.140	-13.73	23.56968	15	
17	4.21	20.59	5.26	18.28	7.08	19.17	18.49	3.55	4.29	18.30	23.36	16.10	18.14	4.10	17.30	2.22	13.23	22.57			
	11.639	2.34	10.906	5.21	12.168	0.31	22.328	-16.44	10.448	10.64	6.858	22.17	22.153	-12.24	20.880	-17.55	17.141	-13.74	23.70110	17	
19	4.26	20.53	5.13	18.23	7.15	19.13	18.40	3.47	4.23	18.23	23.29	16.02	18.06	4.02	17.22	2.14	13.15	22.49			
	11.759	1.57	10.885	6.05	12.319	-0.71	22.309	-16.38	10.474	10.49	6.867	22.16	22.148	-12.26	20.878	-17.56	17.142	-13.76	23.83252	19	
21	4.30	20.47	5.03	18.19	7.21	19.08	18.31	3.38	4.18	18.16	23.21	15.55	17.58	3.53	17.14	2.06	13.07	22.42			
	11.878	0.79	10.902	6.62	12.470	-1.73	22.294	-16.31	10.501	10.34	6.876	22.15	22.144	-12.29	20.876	-17.57	17.144	-13.77	23.96394	21	
23	4.34	20.42	4.57	18.16	7.28	19.04	18.22	3.30	4.12	18.09	23.14	15.47	17.50	3.45	17.06	1.58	12.60	22.34			
	11.998	0.01	10.958	6.90	12.621	-2.75	22.282	-16.21	10.527	10.19	6.885	22.14	22.140	-12.31	20.874	-17.57	17.146	-13.79	0.09536	23	
25	4.38	20.36	4.54	18.14	7.34	18.60	18.13	3.23	4.07	18.02	23.07	15.40	17.42	3.37	16.58	1.49	12.52	22.26			
	12.118	-0.77	11.050	6.86	12.773	-3.76	22.273	-16.10	10.554	10.04	6.893	22.13	22.136	-12.33	20.872	-17.58	17.147	-13.80	0.22678	25	
27	4.42	20.31	4.56	18.11	7.41	18.56	18.03	3.15	4.02	17.55	22.59	15.32	17.34	3.29	16.50	1.41	12.44	22.18			
	12.238	-1.55	11.174	6.52	12.925	-4.78	22.267	-15.96	10.579	9.90	6.900	22.12	22.132	-12.35	20.870	-17.59	17.149	-13.82	0.35819	27	
29	4.46	20.26	5.00	18.09	7.48	18.52	17.55	3.08	3.56	17.47	22.52	15.25	17.26	3.20	16.42	1.33	12.37	22.10			
	12.358	-2.32	11.325	5.91	13.077	-5.78	22.265	-15.80	10.605	9.75	6.907	22.11	22.128	-12.37	20.868	-17.60	17.152	-13.83	0.48961	29	

PAŹDZIERNIK 2003

Piwnice, CA UMK			← Dane na godz. 12 czasu strefowego (= 10 lub 11 ^b UT) →										Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2452																					
274	1	Śro	914	11.53095	10.14	12.2843	-3.06	1.00125	17.1441	-25.31	57.842	5.3	35	646	1235.5	1824	1408	1735.2	2058	1752	1
275	2	Czw	915	11.57060	10.33	12.3220	-3.29	1.00095	18.1717	-26.53	58.407	6.3	46	648	1235.2	1822	1520	1836.3	2152	1748	2
276	3	Pią	916	12.01026	10.52	12.3558	-3.53	1.00066	19.1910	-26.33	59.020	0.6	57	650	1234.9	1819	1614	1936.1	2302	1744	3
277	4	Sob	917	12.04592	11.11	12.3936	-4.16	1.00037	20.1836	-24.37	59.644	1.6	67	651	1234.6	1817	1652	2032.6	****	1740	4
278	5	Nie	918	12.08557	11.29	12.4314	-4.39	1.00007	21.1433	-21.22	60.256	2.6	77	653	1234.3	1814	1717	2125.0	021	1736	5
279	6	Pon	919	12.12523	11.47	12.4652	-5.02	0.99978	22.0645	-17.07	60.841	3.6	85	655	1234.0	1812	1735	2213.4	143	1732	6
280	7	Wto	920	12.16488	12.05	12.5031	-5.25	0.99949	22.5536	-12.08	61.393	4.6	92	657	1233.7	1810	1749	2258.4	304	1728	7
281	8	Śro	921	12.20454	12.22	12.5411	-5.48	0.99920	23.4152	-6.44	61.906	5.6	97	658	1233.4	1807	1801	2341.0	421	1724	8
282	9	Czw	922	12.24419	12.39	12.5750	-6.11	0.99891	0.2626	-1.10	62.376	6.6	99	700	1233.1	1805	1811	*****	536	1720	9
283	10	Pią	923	12.28385	12.55	13.0130	-6.34	0.99862	1.1013	4.24	62.794	0.1	100	702	1232.8	1803	1821	022.3	650	1716	10
284	11	Sob	924	12.32350	13.11	13.0511	-6.56	0.99833	1.5405	9.44	63.147	1.1	99	704	1232.6	1800	1832	103.3	802	1712	11
285	12	Nie	925	12.36316	13.27	13.0852	-7.19	0.99805	2.3850	14.39	63.414	2.1	96	706	1232.3	1758	1845	144.8	915	1708	12
286	13	Pon	926	12.40281	13.41	13.1234	-7.41	0.99777	3.2506	18.59	63.573	3.1	91	707	1232.1	1756	1901	227.6	1029	1704	13
287	14	Wto	927	12.44247	13.56	13.1616	-8.04	0.99749	4.1322	22.33	63.599	4.1	85	709	1231.8	1754	1922	312.5	1142	1701	14
288	15	Śro	928	12.48212	14.10	13.1958	-8.26	0.99721	5.0349	25.11	63.470	5.1	78	711	1231.6	1751	1952	359.7	1252	1657	15
289	16	Czw	929	12.52178	14.23	13.2342	-8.48	0.99693	5.5614	26.42	63.170	6.1	70	713	1231.4	1749	2032	449.3	1356	1653	16
290	17	Pią	930	12.56144	14.36	13.2726	-9.10	0.99665	6.5005	27.01	62.690	7.1	61	715	1231.1	1747	2126	540.6	1449	1649	17
291	18	Sob	931	13.00109	14.48	13.3110	-9.32	0.99638	7.4432	26.01	62.036	8.1	51	716	1230.9	1745	2233	632.9	1531	1645	18
292	19	Nie	932	13.04075	14.59	13.3455	-9.54	0.99610	8.3845	23.42	61.231	0.9	41	718	1230.8	1742	2349	725.1	1601	1641	19
293	20	Pon	933	13.08040	15.10	13.3841	-10.15	0.99583	9.3209	20.09	60.313	1.9	31	720	1230.6	1740	****	816.5	1624	1637	20
294	21	Wto	934	13.12006	15.20	13.4227	-10.37	0.99555	10.2431	15.29	59.339	2.9	22	722	1230.4	1738	111	906.8	1641	1633	21
295	22	Śro	935	13.15571	15.30	13.4614	-10.58	0.99528	11.1608	9.52	58.380	3.9	13	724	1230.2	1736	236	956.1	1656	1629	22
296	23	Czw	936	13.19537	15.39	13.5002	-11.19	0.99501	12.0737	3.35	57.517	4.9	6	726	1230.1	1734	402	1045.3	1709	1625	23
297	24	Pią	937	13.23502	15.47	13.5350	-11.40	0.99474	12.5953	-3.04	56.828	5.9	2	728	1230.0	1731	531	1135.3	1721	1621	24
298	25	Sob	938	13.27468	15.54	13.5739	-12.01	0.99446	13.5355	-9.42	56.381	6.9	0	729	1229.8	1729	702	1227.1	1736	1617	25
299	26	Nie	939	13.31433	16.01	14.0129	-12.22	0.99419	14.5040	-15.51	56.215	0.9	1	731	1229.7	1727	837	1322.1	1754	1613	26
299	26	Nie	939	14.31532	16.01	14.0139	-12.23	0.99418	14.5306	-16.05	56.215	1.9	1	631	1129.7	1627	737	1222.0	1654	1513	26
300	27	Pon	940	14.35497	16.07	14.0529	-12.43	0.99391	15.5313	-21.12	56.351	2.9	5	633	1129.6	1625	913	1320.7	1717	1509	27
301	28	Wto	941	14.39463	16.13	14.0921	-13.03	0.99364	16.5618	-24.53	56.751	3.9	12	635	1129.5	1623	1047	1422.5	1752	1506	28
302	29	Śro	942	14.43429	16.17	14.1313	-13.23	0.99337	18.0060	-26.49	57.361	4.9	21	637	1129.5	1621	1209	1526.0	1841	1502	29
303	30	Czw	943	14.47394	16.21	14.1706	-13.43	0.99310	19.0509	-26.54	58.114	5.9	31	639	1129.4	1619	1312	1628.5	1948	1458	30
304	31	Pią	944	14.51360	16.24	14.2059	-14.03	0.99283	20.0639	-25.16	58.939	6.9	42	641	1129.4	1617	1355	1727.6	2107	1454	31

Fazy Księżyca [Dm, h.mm]: 1kw 2, 21.09 Pełn 10, 9.27 3kw 18, 14.31 Now 25, 14.50

PAŹDZIERNIK 2003 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.50	20.20	5.07	18.07	7.54	18.47	17.46	3.02	3.51	17.40	22.45	15.17	17.18	3.12	16.34	1.25	12.29	22.02		
	12.479	-3.10	11.497	5.07	13.230	-6.78	22.267	-15.62	10.631	9.60	6.914	22.10	22.124	-12.39	20.867	-17.60	17.154	-13.85	0.62103	1
3	4.54	20.15	5.16	18.05	8.01	18.43	17.37	2.55	3.45	17.33	22.37	15.10	17.10	3.04	16.26	1.17	12.21	21.55		
	12.599	-3.88	11.685	4.03	13.383	-7.77	22.271	-15.43	10.656	9.45	6.920	22.09	22.120	-12.41	20.865	-17.61	17.156	-13.86	0.75245	3
5	4.58	20.10	5.27	18.02	8.08	18.39	17.28	2.49	3.39	17.26	22.30	15.02	17.02	2.56	16.18	1.09	12.14	21.47		
	12.720	-4.65	11.883	2.83	13.538	-8.75	22.280	-15.21	10.681	9.31	6.926	22.09	22.117	-12.43	20.864	-17.62	17.159	-13.88	0.88387	5
7	5.02	20.05	5.38	17.60	8.15	18.35	17.20	2.43	3.34	17.19	22.22	14.55	16.54	2.48	16.10	1.01	12.06	21.39		
	12.842	-5.42	12.088	1.53	13.693	-9.71	22.291	-14.98	10.706	9.17	6.931	22.08	22.114	-12.45	20.863	-17.62	17.162	-13.90	1.01529	7
9	5.05	20.01	5.50	17.57	8.21	18.32	17.11	2.38	3.28	17.12	22.15	14.47	16.46	2.40	16.03	0.54	11.59	21.31		
	12.964	-6.18	12.298	0.13	13.848	-10.66	22.306	-14.73	10.730	9.02	6.935	22.07	22.111	-12.46	20.861	-17.63	17.164	-13.91	1.14671	9
11	5.09	19.56	6.03	17.54	8.28	18.28	17.03	2.33	3.23	17.04	22.07	14.39	16.38	2.31	15.55	0.46	11.51	21.23		
	13.086	-6.94	12.509	-1.31	14.005	-11.60	22.324	-14.47	10.755	8.88	6.940	22.07	22.108	-12.48	20.861	-17.63	17.167	-13.93	1.27812	11
13	5.13	19.51	6.15	17.51	8.35	18.24	16.54	2.28	3.17	16.57	21.59	14.32	16.30	2.23	15.47	0.38	11.43	21.16		
	13.209	-7.69	12.721	-2.78	14.163	-12.51	22.345	-14.19	10.779	8.74	6.943	22.06	22.105	-12.49	20.860	-17.63	17.170	-13.94	1.40954	13
15	5.16	19.47	6.28	17.48	8.42	18.20	16.46	2.23	3.11	16.50	21.52	14.24	16.22	2.15	15.39	0.30	11.36	21.08		
	13.333	-8.43	12.932	-4.27	14.322	-13.41	22.368	-13.90	10.802	8.61	6.946	22.06	22.102	-12.50	20.859	-17.64	17.173	-13.96	1.54096	15
17	5.20	19.42	6.41	17.45	8.49	18.17	16.38	2.18	3.06	16.43	21.44	14.16	16.14	2.07	15.31	0.22	11.28	21.00		
	13.457	-9.17	13.143	-5.75	14.482	-14.28	22.395	-13.59	10.826	8.47	6.949	22.06	22.100	-12.52	20.859	-17.64	17.177	-13.97	1.67238	17
19	5.23	19.38	6.53	17.42	8.56	18.14	16.30	2.14	2.60	16.35	21.36	14.09	16.06	1.59	15.23	0.14	11.21	20.52		
	13.582	-9.90	13.352	-7.22	14.643	-15.13	22.424	-13.28	10.849	8.34	6.951	22.06	22.098	-12.53	20.858	-17.64	17.180	-13.99	1.80381	19
21	5.27	19.34	7.06	17.38	9.03	18.10	16.22	2.10	2.54	16.28	21.29	14.01	15.58	1.51	15.15	0.06	11.13	20.45		
	13.708	-10.62	13.561	-8.66	14.805	-15.96	22.455	-12.94	10.872	8.20	6.952	22.05	22.096	-12.54	20.858	-17.64	17.184	-14.00	1.93522	21
23	5.30	19.30	7.18	17.35	9.10	18.07	16.15	2.06	2.48	16.21	21.21	13.53	15.51	1.43	15.07	23.54	11.06	20.37		
	13.834	-11.32	13.769	-10.07	14.969	-16.76	22.489	-12.60	10.894	8.07	6.953	22.05	22.094	-12.55	20.858	-17.64	17.187	-14.02	2.06664	23
25	5.34	19.26	7.31	17.32	9.16	18.05	16.07	2.03	2.42	16.14	21.13	13.45	15.43	1.35	14.60	23.46	10.58	20.29		
	13.961	-12.02	13.976	-11.45	15.134	-17.53	22.526	-12.25	10.916	7.94	6.954	22.05	22.092	-12.55	20.858	-17.64	17.191	-14.03	2.19806	25
27	4.37	18.22	6.43	16.29	8.24	17.02	14.59	0.59	1.37	15.06	20.05	12.37	14.35	0.27	13.52	22.39	9.50	19.21		
	14.092	-12.72	14.187	-12.81	15.304	-18.29	22.565	-11.87	10.938	7.81	6.954	22.05	22.091	-12.56	20.859	-17.64	17.195	-14.05	2.32948	27
29	4.40	18.18	6.55	16.26	8.30	16.60	14.52	0.56	1.31	14.59	19.57	12.29	14.27	0.19	13.44	22.31	9.43	19.14		
	14.220	-13.39	14.394	-14.09	15.472	-19.00	22.606	-11.50	10.959	7.69	6.953	22.06	22.090	-12.57	20.859	-17.64	17.199	-14.06	2.46090	29
31	4.44	18.15	7.07	16.23	8.37	16.57	14.44	0.53	1.25	14.52	19.49	12.21	14.19	0.11	13.36	22.23	9.35	19.06		
	14.350	-14.05	14.600	-15.32	15.642	-19.67	22.649	-11.11	10.980	7.57	6.952	22.06	22.089	-12.57	20.860	-17.64	17.203	-14.08	2.59232	31

LISTOPAD 2003

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2452																			
305	1	Sob	945	14.55325	16.26	14.2454	-14.22	0.99256	21.0409	-22.12	59.774	0.3	53	643	1129.3	1615	1424	1822.1	2230	1450	1	
306	2	Nie	946	14.59291	16.27	14.2849	-14.41	0.99230	21.5719	-18.05	60.570	1.3	63	645	1129.3	1613	1444	1911.8	2352	1446	2	
307	3	Pon	947	15.03257	16.28	14.3245	-15.00	0.99204	22.4639	-13.13	61.294	2.3	73	646	1129.3	1611	1458	1957.6	****	1442	3	
308	4	Wto	948	15.07222	16.28	14.3641	-15.19	0.99178	23.3259	-7.54	61.928	3.3	82	648	1129.3	1610	1510	2040.4	110	1438	4	
309	5	Śro	949	15.11188	16.27	14.4039	-15.37	0.99152	0.1722	-2.22	62.463	4.3	89	650	1129.3	1608	1521	2121.5	225	1434	5	
310	6	Czw	950	15.15153	16.25	14.4437	-15.56	0.99127	1.0048	3.10	62.900	5.3	94	652	1129.3	1606	1531	2202.0	338	1430	6	
311	7	Pią	951	15.19119	16.23	14.4836	-16.13	0.99102	1.4414	8.33	63.241	6.3	98	654	1129.4	1604	1541	2242.9	450	1426	7	
312	8	Sob	952	15.23084	16.19	14.5236	-16.31	0.99077	2.2830	13.34	63.490	7.3	100	656	1129.4	1602	1553	2325.0	602	1422	8	
313	9	Nie	953	15.27050	16.15	14.5637	-16.48	0.99053	3.1418	18.04	63.645	0.4	100	658	1129.5	1601	1608	*****	716	1418	9	
314	10	Pon	954	15.31015	16.10	15.0039	-17.05	0.99029	4.0207	21.50	63.702	1.4	98	700	1129.6	1559	1627	009.2	829	1414	10	
315	11	Wto	955	15.34581	16.04	15.0441	-17.22	0.99006	4.5208	24.43	63.651	2.4	95	701	1129.7	1557	1653	055.7	941	1410	11	
316	12	Śro	956	15.38546	15.57	15.0845	-17.39	0.98983	5.4408	26.31	63.480	3.4	90	703	1129.8	1556	1729	144.5	1048	1407	12	
317	13	Czw	957	15.42512	15.49	15.1249	-17.55	0.98961	6.3731	27.06	63.173	4.4	84	705	1129.9	1554	1817	235.2	1145	1403	13	
318	14	Pią	958	15.46478	15.41	15.1654	-18.11	0.98939	7.3122	26.26	62.722	5.4	76	707	1130.1	1553	1919	326.8	1230	1359	14	
319	15	Sob	959	15.50443	15.31	15.2060	-18.26	0.98917	8.2450	24.28	62.122	6.4	67	709	1130.2	1551	2031	418.3	1304	1355	15	
320	16	Nie	960	15.54409	15.21	15.2507	-18.41	0.98896	9.1714	21.19	61.380	7.4	57	711	1130.4	1550	2149	508.9	1328	1351	16	
321	17	Pon	961	15.58374	15.10	15.2914	-18.56	0.98875	10.0823	17.05	60.517	0.3	47	712	1130.6	1548	2310	558.0	1347	1347	17	
322	18	Wto	962	16.02340	14.58	15.3323	-19.11	0.98854	10.5832	11.55	59.572	1.3	37	714	1130.8	1547	****	646.0	1401	1343	18	
323	19	Śro	963	16.06306	14.45	15.3732	-19.25	0.98834	11.4820	6.02	58.602	2.3	26	716	1131.0	1545	033	733.3	1414	1339	19	
324	20	Czw	964	16.10271	14.31	15.4143	-19.39	0.98813	12.3844	-0.21	57.679	3.3	17	718	1131.2	1544	157	821.2	1427	1335	20	
325	21	Pią	965	16.14236	14.17	15.4554	-19.52	0.98794	13.3051	-6.55	56.884	4.3	9	720	1131.5	1543	325	910.7	1440	1331	21	
326	22	Sob	966	16.18202	14.02	15.5006	-20.05	0.98774	14.2550	-13.17	56.298	5.3	3	721	1131.7	1542	456	1003.3	1455	1327	22	
327	23	Nie	967	16.22168	13.46	15.5418	-20.18	0.98755	15.2437	-18.57	55.984	6.3	0	723	1132.0	1540	632	1060.0	1515	1323	23	
328	24	Pon	968	16.26133	13.29	15.5832	-20.31	0.98735	16.2726	-23.26	55.980	0.5	0	725	1132.3	1539	810	1201.3	1544	1319	24	
329	25	Wto	969	16.30099	13.11	16.0246	-20.43	0.98717	17.3322	-26.14	56.286	1.5	3	726	1132.6	1538	941	1306.1	1626	1315	25	
330	26	Śro	970	16.34064	12.52	16.0701	-20.54	0.98698	18.4014	-27.05	56.865	2.5	9	728	1132.9	1537	1057	1411.9	1728	1311	26	
331	27	Czw	971	16.38030	12.33	16.1117	-21.05	0.98680	19.4516	-26.02	57.654	3.5	17	730	1133.2	1536	1151	1515.2	1845	1308	27	
332	28	Pią	972	16.41596	12.13	16.1533	-21.16	0.98661	20.4617	-23.19	58.573	4.5	26	731	1133.5	1535	1226	1613.9	2011	1304	28	
333	29	Sob	973	16.45561	11.53	16.1950	-21.27	0.98644	21.4223	-19.21	59.541	5.5	37	733	1133.9	1534	1250	1707.0	2136	1300	29	
334	30	Nie	974	16.49527	11.32	16.2408	-21.37	0.98626	22.3350	-14.33	60.483	6.5	47	734	1134.2	1534	1306	1755.1	2257	1256	30	

Fazy Księżyca [Dm, h.mm]: 1kw 1, 5.25 Pełn 9, 2.13 3kw 17, 5.15 Nów 24, 23.59 1kw 30, 18.16

LISTOPAD 2003 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.45	18.13	7.13	16.21	8.40	16.56	14.40	0.52	1.22	14.48	19.45	12.17	14.15	0.07	13.32	22.19	9.32	19.02		
	14.415	-14.37	14.703	-15.92	15.727	-20.00	22.672	-10.91	10.990	7.51	6.951	22.06	22.088	-12.57	20.860	-17.64	17.205	-14.08	2.65803	1
3	4.49	18.10	7.25	16.19	8.47	16.55	14.33	0.49	1.16	14.41	19.37	12.10	14.07	23.55	13.24	22.11	9.24	18.54		
	14.546	-15.01	14.910	-17.08	15.898	-20.62	22.717	-10.51	11.011	7.39	6.949	22.06	22.088	-12.57	20.861	-17.63	17.209	-14.10	2.78945	3
5	4.52	18.07	7.36	16.16	8.54	16.53	14.26	0.46	1.10	14.34	19.29	12.02	13.59	23.47	13.16	22.03	9.17	18.47		
	14.677	-15.62	15.118	-18.17	16.071	-21.20	22.765	-10.10	11.030	7.27	6.946	22.07	22.087	-12.57	20.862	-17.63	17.214	-14.11	2.92087	5
7	4.55	18.04	7.48	16.14	9.00	16.52	14.18	0.43	1.04	14.26	19.21	11.54	13.51	23.40	13.09	21.56	9.09	18.39		
	14.810	-16.22	15.326	-19.21	16.245	-21.74	22.814	-9.69	11.050	7.16	6.943	22.07	22.087	-12.57	20.863	-17.63	17.218	-14.13	3.05228	7
9	4.58	18.01	7.59	16.12	9.06	16.51	14.11	0.41	0.58	14.19	19.13	11.45	13.43	23.32	13.01	21.48	9.02	18.31		
	14.944	-16.81	15.535	-20.18	16.420	-22.24	22.865	-9.26	11.068	7.05	6.940	22.08	22.087	-12.57	20.864	-17.62	17.222	-14.14	3.18370	9
11	5.02	17.58	8.10	16.11	9.12	16.50	14.04	0.39	0.51	14.12	19.05	11.37	13.36	23.24	12.53	21.40	8.54	18.24		
	15.078	-17.37	15.746	-21.08	16.596	-22.70	22.917	-8.83	11.087	6.94	6.936	22.08	22.087	-12.57	20.866	-17.62	17.227	-14.15	3.31513	11
13	5.05	17.55	8.20	16.10	9.18	16.50	13.57	0.36	0.45	14.04	18.57	11.29	13.28	23.16	12.45	21.32	8.47	18.16		
	15.214	-17.91	15.957	-21.92	16.774	-23.12	22.971	-8.39	11.105	6.84	6.931	22.09	22.088	-12.57	20.867	-17.61	17.232	-14.17	3.44655	13
15	5.08	17.53	8.31	16.09	9.24	16.50	13.50	0.34	0.39	13.57	18.48	11.21	13.20	23.08	12.37	21.25	8.39	18.08		
	15.350	-18.44	16.169	-22.68	16.952	-23.49	23.026	-7.94	11.122	6.74	6.926	22.10	22.088	-12.56	20.869	-17.60	17.236	-14.18	3.57797	15
17	5.11	17.51	8.41	16.09	9.29	16.50	13.43	0.32	0.33	13.49	18.40	11.13	13.12	23.00	12.30	21.17	8.31	18.01		
	15.487	-18.94	16.382	-23.37	17.132	-23.82	23.082	-7.48	11.139	6.64	6.920	22.11	22.089	-12.56	20.871	-17.60	17.241	-14.19	3.70939	17
19	5.14	17.49	8.51	16.09	9.34	16.51	13.36	0.30	0.26	13.42	18.32	11.05	13.04	22.53	12.22	21.09	8.24	17.53		
	15.626	-19.42	16.596	-23.99	17.312	-24.09	23.140	-7.02	11.155	6.55	6.914	22.12	22.090	-12.55	20.873	-17.59	17.246	-14.20	3.84081	19
21	5.17	17.47	8.60	16.10	9.39	16.52	13.29	0.29	0.20	13.35	18.24	10.57	12.56	22.45	12.14	21.02	8.16	17.45		
	15.765	-19.87	16.810	-24.52	17.493	-24.32	23.198	-6.56	11.171	6.45	6.908	22.13	22.091	-12.54	20.875	-17.58	17.251	-14.22	3.97223	21
23	5.19	17.45	9.08	16.11	9.43	16.54	13.22	0.27	0.13	13.27	18.15	10.49	12.48	22.37	12.06	20.54	8.09	17.38		
	15.905	-20.30	17.023	-24.96	17.674	-24.51	23.258	-6.09	11.186	6.37	6.901	22.14	22.093	-12.53	20.877	-17.57	17.255	-14.23	4.10365	23
25	5.22	17.44	9.16	16.13	9.47	16.56	13.15	0.25	0.07	13.20	18.07	10.40	12.41	22.30	11.58	20.46	8.01	17.30		
	16.046	-20.71	17.236	-25.32	17.856	-24.64	23.319	-5.61	11.201	6.28	6.894	22.15	22.095	-12.52	20.880	-17.56	17.260	-14.24	4.23507	25
27	5.25	17.42	9.23	16.15	9.51	16.58	13.09	0.24	23.56	13.12	17.58	10.32	12.33	22.22	11.51	20.39	7.54	17.23		
	16.188	-21.09	17.447	-25.59	18.038	-24.72	23.380	-5.12	11.215	6.20	6.886	22.16	22.097	-12.51	20.882	-17.55	17.265	-14.25	4.36650	27
29	5.27	17.41	9.29	16.19	9.54	17.01	13.02	0.22	23.50	13.05	17.50	10.24	12.25	22.14	11.43	20.31	7.46	17.15		
	16.331	-21.45	17.655	-25.77	18.220	-24.75	23.443	-4.64	11.229	6.13	6.877	22.17	22.099	-12.50	20.885	-17.54	17.270	-14.26	4.49792	29

GRUDZIEŃ 2003

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]									
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2452																			
335	1	Pon	975	16.53493	11.10	16.2827	-21.46	0.98609	23.2131	-9.15	61.346	0.7	58	736	1134.6	1533	1319	1839.3	****	1252	1	
336	2	Wto	976	16.57458	10.47	16.3246	-21.56	0.98593	0.0635	-3.43	62.089	1.7	67	737	1135.0	1532	1330	1921.1	014	1248	2	
337	3	Śro	977	17.01424	10.24	16.3705	-22.04	0.98577	0.5011	1.50	62.691	2.7	76	739	1135.3	1532	1340	2001.6	127	1244	3	
338	4	Czw	978	17.05389	10.00	16.4126	-22.13	0.98561	1.3323	7.15	63.147	3.7	84	740	1135.7	1531	1350	2042.1	239	1240	4	
339	5	Pią	979	17.09355	9.36	16.4546	-22.21	0.98546	2.1711	12.21	63.459	4.7	90	742	1136.1	1530	1401	2123.5	351	1236	5	
340	6	Sob	980	17.13320	9.11	16.5008	-22.28	0.98531	3.0222	16.58	63.638	5.7	95	743	1136.6	1530	1415	2206.8	504	1232	6	
341	7	Nie	981	17.17286	8.46	16.5430	-22.35	0.98517	3.4934	20.56	63.698	6.7	98	744	1137.0	1529	1432	2252.4	617	1228	7	
342	8	Pon	982	17.21251	8.20	16.5852	-22.42	0.98504	4.3905	24.03	63.652	7.7	100	745	1137.4	1529	1456	2340.7	730	1224	8	
343	9	Wto	983	17.25217	7.54	17.0315	-22.48	0.98491	5.3049	26.08	63.508	0.6	100	747	1137.9	1529	1528	*****	839	1220	9	
344	10	Śro	984	17.29183	7.27	17.0738	-22.54	0.98478	6.2409	27.02	63.271	1.6	98	748	1138.3	1529	1613	031.1	940	1216	10	
345	11	Czw	985	17.33148	6.60	17.1202	-22.59	0.98467	7.1810	26.39	62.941	2.6	94	749	1138.8	1528	1711	122.8	1029	1213	11	
346	12	Pią	986	17.37114	6.32	17.1626	-23.04	0.98456	8.1146	24.60	62.515	3.6	88	750	1139.2	1528	1820	214.5	1106	1209	12	
347	13	Sob	987	17.41080	6.04	17.2051	-23.08	0.98445	9.0408	22.08	61.987	4.6	81	751	1139.7	1528	1936	305.2	1133	1205	13	
348	14	Nie	988	17.45045	5.36	17.2516	-23.12	0.98435	9.5454	18.12	61.359	5.6	73	752	1140.2	1528	2055	354.2	1153	1201	14	
349	15	Pon	989	17.49011	5.07	17.2941	-23.15	0.98426	10.4411	13.23	60.636	6.6	63	753	1140.6	1528	2215	441.5	1208	1157	15	
350	16	Wto	990	17.52576	4.38	17.3406	-23.18	0.98417	11.3234	7.51	59.837	7.6	53	754	1141.1	1528	2335	527.6	1221	1153	16	
351	17	Śro	991	17.56542	4.09	17.3832	-23.21	0.98408	12.2057	1.48	58.994	0.7	42	755	1141.6	1529	****	613.3	1233	1149	17	
352	18	Czw	992	18.00507	3.39	17.4258	-23.23	0.98400	13.1026	-4.29	58.156	1.7	31	755	1142.1	1529	058	660.0	1245	1145	18	
353	19	Pią	993	18.04473	3.10	17.4724	-23.25	0.98393	14.0216	-10.44	57.387	2.7	21	756	1142.6	1529	224	748.9	1258	1141	19	
354	20	Sob	994	18.08438	2.40	17.5151	-23.26	0.98386	14.5740	-16.35	56.757	3.7	12	757	1143.1	1529	354	841.6	1315	1137	20	
355	21	Nie	995	18.12404	2.10	17.5617	-23.26	0.98379	15.5727	-21.32	56.337	4.7	6	757	1143.6	1530	529	939.1	1338	1133	21	
356	22	Pon	996	18.16370	1.40	18.0044	-23.26	0.98372	17.0135	-25.07	56.182	5.7	1	758	1144.1	1530	704	1041.6	1412	1129	22	
357	23	Wto	997	18.20335	1.10	18.0510	-23.26	0.98366	18.0838	-26.54	56.320	0.1	0	758	1144.6	1531	829	1147.6	1504	1125	23	
358	24	Śro	998	18.24301	0.40	18.0937	-23.25	0.98361	19.1554	-26.40	56.746	1.1	2	759	1145.1	1531	936	1253.8	1615	1121	24	
359	25	Czw	999	18.28267	0.10	18.1403	-23.24	0.98355	20.2029	-24.34	57.421	2.1	6	759	1145.6	1532	1021	1356.8	1740	1117	25	
360	26	Pią	000	18.32232	-0.19	18.1830	-23.22	0.98350	21.2028	-20.56	58.280	3.1	13	759	1146.1	1533	1051	1454.6	1909	1114	26	
361	27	Sob	001	18.36198	-0.49	18.2256	-23.20	0.98346	22.1522	-16.15	59.242	4.1	21	800	1146.6	1534	1111	1546.6	2035	1110	27	
362	28	Nie	002	18.40163	-1.19	18.2722	-23.17	0.98342	23.0545	-10.55	60.225	5.1	30	800	1147.1	1534	1126	1633.9	2156	1106	28	
363	29	Pon	003	18.44129	-1.48	18.3148	-23.14	0.98338	23.5243	-5.17	61.157	6.1	40	800	1147.5	1535	1137	1717.7	2313	1102	29	
364	30	Wto	004	18.48094	-2.17	18.3614	-23.11	0.98335	0.3728	0.23	61.977	0.0	50	800	1148.0	1536	1148	1759.3	****	1058	30	
365	31	Śro	005	18.52060	-2.46	18.4039	-23.07	0.98332	1.2112	5.55	62.647	1.0	60	800	1148.5	1537	1158	1840.1	027	1054	31	

Fazy Księżyca [Dm, h.mm]: 1kw 0, 18.16 Pełn 8, 21.37 3kw 16, 18.42 Now 23, 10.43 1kw 30, 11.03

GRUDZIEŃ 2003 (c.d.)

Świty, zmierny astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST Zach (0^h UT) Dm	
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach		
1	5.30	17.40	9.34	16.22	9.57	17.04	12.55	0.21	23.43	12.57	17.41	10.16	12.17	22.07	11.35	20.23	7.39	17.07		
	16.474	-21.77	17.858	-25.85	18.402	-24.73	23.506	-4.14	11.241	6.06	6.869	22.19	22.101	-12.48	20.888	-17.53	17.275	-14.27	4.62934	1
3	5.32	17.39	9.38	16.26	9.60	17.07	12.49	0.19	23.36	12.50	17.33	10.07	12.09	21.59	11.27	20.16	7.31	16.60		
	16.618	-22.07	18.054	-25.84	18.584	-24.67	23.571	-3.65	11.254	5.99	6.860	22.20	22.104	-12.47	20.891	-17.52	17.280	-14.28	4.76076	3
5	5.34	17.39	9.40	16.30	10.02	17.11	12.42	0.18	23.29	12.42	17.24	9.59	12.02	21.51	11.20	20.08	7.24	16.52		
	16.763	-22.34	18.242	-25.73	18.766	-24.55	23.636	-3.15	11.265	5.92	6.850	22.21	22.106	-12.45	20.894	-17.51	17.286	-14.29	4.89217	5
7	5.37	17.38	9.41	16.35	10.03	17.16	12.35	0.17	23.22	12.35	17.16	9.51	11.54	21.44	11.12	20.01	7.16	16.44		
	16.908	-22.59	18.416	-25.54	18.947	-24.38	23.702	-2.65	11.276	5.86	6.841	22.23	22.109	-12.43	20.897	-17.49	17.291	-14.30	5.02360	7
9	5.39	17.38	9.40	16.38	10.05	17.20	12.29	0.16	23.15	12.27	17.07	9.42	11.46	21.36	11.04	19.53	7.09	16.37		
	17.054	-22.80	18.574	-25.25	19.128	-24.16	23.768	-2.14	11.286	5.81	6.831	22.24	22.113	-12.41	20.900	-17.48	17.296	-14.31	5.15502	9
11	5.40	17.38	9.38	16.42	10.06	17.25	12.22	0.14	23.08	12.20	16.59	9.34	11.38	21.29	10.56	19.45	7.01	16.29		
	17.201	-22.98	18.710	-24.89	19.307	-23.90	23.836	-1.63	11.296	5.76	6.820	22.26	22.116	-12.39	20.904	-17.47	17.301	-14.32	5.28644	11
13	5.42	17.38	9.33	16.44	10.06	17.30	12.16	0.13	23.01	12.12	16.50	9.25	11.31	21.21	10.49	19.38	6.54	16.22		
	17.347	-23.14	18.816	-24.46	19.486	-23.58	23.904	-1.12	11.305	5.71	6.810	22.27	22.120	-12.37	20.907	-17.45	17.306	-14.33	5.41787	13
15	5.44	17.38	9.25	16.44	10.06	17.36	12.09	0.12	22.54	12.04	16.41	9.17	11.23	21.14	10.41	19.30	6.46	16.14		
	17.495	-23.26	18.887	-23.98	19.664	-23.22	23.972	-0.61	11.313	5.67	6.799	22.29	22.123	-12.35	20.911	-17.44	17.311	-14.34	5.54929	15
17	5.45	17.39	9.15	16.41	10.06	17.42	12.03	0.11	22.47	11.57	16.33	9.09	11.15	21.06	10.33	19.23	6.39	16.06		
	17.642	-23.35	18.913	-23.46	19.840	-22.81	0.041	-0.09	11.320	5.63	6.788	22.30	22.127	-12.33	20.915	-17.42	17.316	-14.34	5.68071	17
19	5.47	17.39	9.02	16.36	10.05	17.48	11.56	0.10	22.40	11.49	16.24	9.00	11.07	20.59	10.25	19.15	6.31	15.59		
	17.790	-23.41	18.888	-22.92	20.016	-22.36	0.111	0.43	11.327	5.60	6.777	22.32	22.131	-12.31	20.919	-17.41	17.321	-14.35	5.81212	19
21	5.48	17.40	8.45	16.27	10.04	17.54	11.50	0.09	22.32	11.42	16.15	8.52	10.60	20.51	10.18	19.08	6.24	15.51		
	17.938	-23.44	18.808	-22.38	20.190	-21.87	0.181	0.95	11.333	5.57	6.765	22.33	22.136	-12.28	20.923	-17.39	17.327	-14.36	5.94355	21
23	5.49	17.41	8.25	16.15	10.03	18.00	11.44	0.09	22.25	11.34	16.07	8.43	10.52	20.44	10.10	19.00	6.16	15.44		
	18.086	-23.43	18.674	-21.86	20.362	-21.33	0.252	1.46	11.338	5.55	6.754	22.35	22.140	-12.25	20.927	-17.37	17.332	-14.36	6.07497	23
25	5.50	17.43	8.04	16.00	10.01	18.06	11.37	0.08	22.17	11.26	15.58	8.35	10.44	20.36	10.02	18.53	6.09	15.36		
	18.234	-23.40	18.500	-21.37	20.533	-20.75	0.323	1.99	11.342	5.53	6.742	22.36	22.145	-12.23	20.931	-17.36	17.337	-14.37	6.20640	25
27	5.50	17.44	7.41	15.44	9.59	18.13	11.31	0.07	22.10	11.18	15.49	8.26	10.36	20.29	9.55	18.45	6.01	15.28		
	18.382	-23.34	18.305	-20.93	20.703	-20.14	0.395	2.51	11.346	5.52	6.730	22.38	22.150	-12.20	20.935	-17.34	17.342	-14.38	6.33782	27
29	5.51	17.45	7.19	15.27	9.57	18.20	11.24	0.06	22.02	11.11	15.41	8.18	10.29	20.21	9.47	18.38	5.54	15.21		
	18.530	-23.24	18.115	-20.58	20.871	-19.48	0.468	3.03	11.349	5.51	6.719	22.39	22.155	-12.17	20.940	-17.32	17.347	-14.38	6.46924	29
31	5.51	17.47	7.00	15.11	9.54	18.26	11.18	0.06	21.54	11.03	15.32	8.10	10.21	20.14	9.39	18.30	5.46	15.13		
	18.677	-23.11	17.952	-20.34	21.038	-18.79	0.540	3.55	11.351	5.51	6.707	22.41	22.160	-12.14	20.944	-17.30	17.352	-14.39	6.60065	31

Święta państwowe i kościelne w Polsce oraz inne ważniejsze dni w roku 2003

Nowy Rok	Śro	1 styczeń	Dzień Dziecka	Nie	1 czerwiec
Najświętszej Maryi Panny Rodzicielki	Śro	1 styczeń	Dzień Dziękczynienia	Nie	1 czerwiec
Objawienia Pańskiego (Trzech Króli)	Pon	6 styczeń	Zesłania Ducha Świętego	Nie	8 czerwiec
Juliański Nowy Rok	Wto	14 styczeń	Trójcy Najświętszej	Nie	15 czerwiec
Dzień Babci	Wto	21 styczeń	Boże Ciało	Czw	19 czerwiec
Dzień Dziadka	Śro	22 styczeń	Dzień Ojca	Pon	23 czerwiec
Ofiarowania Pańskiego	Nie	2 luty	Noc Świętojańska	Pon	23 czerwiec
Matki Boskiej Gromnicznej	Nie	2 luty	Najświętszego Serca Pana Jezusa	Pią	27 czerwiec
Walentynki	Pią	14 luty	Św. Piotra i Pawła	Nie	29 czerwiec
Święto UMK	Śro	19 luty	Wniebowzięcia N.M.P.	Pią	15 sierpień
Tłusty czwartek	Czw	27 luty	Święto Wojska Polskiego	Pią	15 sierpień
Środa Popielcowa	Śro	5 marzec	Dzień Solidarności i Wolności	Nie	31 sierpień
Dzień Kobiet	Sob	8 marzec	Dzień Programisty	Sob	13 wrzesień
Narodowy Dzień Życia	Pon	24 marzec	Dożynki – Święto Plonów	Wto	23 wrzesień
Niedziela Palmowa	Nie	13 kwiecień	Dzień Papieski	Nie	12 październik
Niedziela Wielkanocna	Nie	20 kwiecień	Dzień Edukacji Narodowej	Wto	14 październik
Niedziela Miłosierdzia Bożego	Nie	27 kwiecień	Dzień Papieża Jana Pawła II	Czw	16 październik
Święto Pracy	Czw	1 maj	Wszystkich Świętych	Sob	1 listopad
Dzień Flagi Rzeczypospolitej Polskiej	Pią	2 maj	Zaduszki	Nie	2 listopad
Najświętsza Maryja Królowa Polski	Sob	3 maj	Święto Niepodległości	Wto	11 listopad
Święto Konstytucji 3 Maja	Sob	3 maj	Pierwsza niedziela Adwentu	Nie	30 listopad
Dzień Polskiej Niezapominajki	Czw	15 maj	Niepokalane Poczęcie N.M.P.	Pon	8 grudzień
Dzień Matki	Pon	26 maj	Boże Narodzenie	Czw	25 grudzień
Wniebowstąpienia Pańskiego	Czw	29 maj	Sylwester	Śro	31 grudzień

Kalendarz astronomiczny 2004

PIWNICE, CA UMK

Współrzędne geograficzne: 18.5641°E 53.0955°N, Nr strefy czasowej (> 0 , gdy na wschód) = 1 (CSE)

Kalendarz jest gregoriańskim i jest oparty na efemerydach Układu Słonecznego obliczanych z dokładnością 1' (Słońce 2", Księżyc 10", Pluton 15'). Czas gwiazdowy ma dokładność około 0.1 s. Wschody i zachody obliczono z uwzględnieniem horyzontalnej refrakcji astronomicznej (34'), rozciągłości Słońca lub Księżyca i paralaksy horyzontalnej Księżyca. Dla dat odległych o więcej niż ok. 300 lat od roku 1950 dokładności położenia planet są gorsze niż 1'!
(Kalendarz ten opracowano [KMB] w Katedrze Radioastronomii CA UMK, Toruń—Piwnice. Oblicz. dnia 7.10.2010 r.)

Data Wielkanocy: **2004 KWIECIEŃ 11**

Dla całego roku przyjęto: TDT – UT = 65 s

Pory roku [miesiąc dzień, godz. mm] (czas zimowy): Wiosna **III 20, 7.48**, Lato **VI 21, 1.57**, Jesień **IX 22, 17.30**, Zima **XII 21, 13.42**

Dane w czasie letnim odróżniono kolorem brązowym; czas ten obowiązuje **od 28 marca do 31 października 2004 r.**

Oznaczenia:

Dr — dzień 2004 roku (1 stycznia Dr = 1)

Dm — dzień miesiąca

Dt — dzień tygodnia

JD — data juliańska modulo 1000 o 12^h UT

(po nagłówku: Entier(JD/1000) dla Dm = 1)

ST — prawdziwy czas gwiazdowy

$\Delta\alpha$ — różnica czasu (czas słoneczny prawdziwy minus średni)

α — rektascensja (Słońca lub Księżyca)

δ — deklinacja (Słońca lub Księżyca)

R — odległość (Słońca lub Księżyca)

j astr — jednostka astronomiczna

ρ_{\oplus} — promień Ziemi

Faza \leftarrow dni po kwadrze i % oświetlonej części tarczy Księżyca

Wsch — wschód (Słońca, Księżyca lub planety)

Gór — górowanie czyli tranzyt (Gal. = centrum Galaktyki)

Zach — zachód (Słońca, Księżyca lub planety)

STYCZEŃ 2004

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2453																					
1	1	Czw	006	18.56026	-3.15	18.4504	-23.02	0.98329	2.0501	11.08	63.142	2.0	69	800	1149.0	1538	1209	1921.4	139	1050	1
2	2	Pią	007	18.59591	-3.43	18.4929	-22.57	0.98328	2.4950	15.53	63.457	3.0	78	800	1149.5	1539	1221	2004.0	252	1046	2
3	3	Sob	008	19.03557	-4.11	18.5353	-22.52	0.98327	3.3625	20.01	63.598	4.0	85	759	1149.9	1541	1237	2048.7	405	1042	3
4	4	Nie	009	19.07522	-4.38	18.5817	-22.46	0.98326	4.2517	23.21	63.582	5.0	91	759	1150.4	1542	1259	2136.1	518	1038	4
5	5	Pon	010	19.11488	-5.05	19.0241	-22.40	0.98326	5.1632	25.42	63.433	6.0	96	759	1150.8	1543	1328	2225.9	629	1034	5
6	6	Wto	011	19.15454	-5.32	19.0704	-22.33	0.98327	6.0944	26.54	63.176	7.0	99	759	1151.3	1544	1409	2317.6	733	1030	6
7	7	Śro	012	19.19419	-5.58	19.1127	-22.25	0.98328	7.0402	26.50	62.835	8.0	100	758	1151.7	1546	1503	*****	826	1026	7
8	8	Czw	013	19.23385	-6.24	19.1549	-22.18	0.98330	7.5819	25.27	62.429	0.8	99	758	1152.1	1547	1610	010.0	907	1022	8
9	9	Pią	014	19.27350	-6.49	19.2011	-22.10	0.98333	8.5131	22.49	61.972	1.8	97	757	1152.6	1548	1725	101.6	937	1019	9
10	10	Sob	015	19.31316	-7.14	19.2433	-22.01	0.98337	9.4301	19.04	61.474	2.8	92	756	1153.0	1550	1844	151.7	959	1015	10
11	11	Nie	016	19.35282	-7.38	19.2853	-21.52	0.98340	10.3244	14.23	60.937	3.8	86	756	1153.4	1551	2004	239.7	1015	1011	11
12	12	Pon	017	19.39247	-8.02	19.3314	-21.43	0.98345	11.2102	8.60	60.365	4.8	78	755	1153.8	1553	2123	325.9	1029	1007	12
13	13	Wto	018	19.43213	-8.25	19.3733	-21.33	0.98350	12.0842	3.07	59.762	5.8	69	754	1154.2	1554	2244	411.1	1040	1003	13
14	14	Śro	019	19.47178	-8.47	19.4152	-21.23	0.98356	12.5644	-3.00	59.141	6.8	58	753	1154.5	1556	****	456.4	1052	959	14
15	15	Czw	020	19.51144	-9.09	19.4610	-21.12	0.98362	13.4619	-9.07	58.524	0.3	47	753	1154.9	1558	006	542.9	1104	955	15
16	16	Pią	021	19.55109	-9.30	19.5028	-21.01	0.98369	14.3840	-14.55	57.943	1.3	36	752	1155.3	1559	131	632.2	1119	951	16
17	17	Sob	022	19.59075	-9.51	19.5445	-20.49	0.98376	15.3449	-20.01	57.443	2.3	25	751	1155.6	1601	301	725.4	1138	947	17
18	18	Nie	023	20.03041	-10.11	19.5902	-20.38	0.98383	16.3518	-23.60	57.076	3.3	16	750	1155.9	1603	433	823.5	1205	943	18
19	19	Pon	024	20.07006	-10.30	20.0317	-20.25	0.98391	17.3936	-26.27	56.891	4.3	8	749	1156.2	1604	601	926.0	1247	939	19
20	20	Wto	025	20.10572	-10.48	20.0732	-20.13	0.98400	18.4553	-27.02	56.926	5.3	3	747	1156.6	1606	716	1031.1	1347	935	20
21	21	Śro	026	20.14537	-11.06	20.1147	-19.60	0.98408	19.5127	-25.42	57.199	6.3	0	746	1156.8	1608	811	1135.7	1506	931	21
22	22	Czw	027	20.18503	-11.23	20.1600	-19.46	0.98417	20.5350	-22.39	57.701	0.6	0	745	1157.1	1610	848	1236.4	1635	927	22
23	23	Pią	028	20.22469	-11.39	20.2013	-19.32	0.98427	21.5141	-18.16	58.396	1.6	3	744	1157.4	1611	912	1332.2	1805	923	23
24	24	Sob	029	20.26434	-11.54	20.2425	-19.18	0.98436	22.4457	-13.01	59.227	2.6	9	743	1157.7	1613	929	1422.9	1930	920	24
25	25	Nie	030	20.30400	-12.09	20.2836	-19.04	0.98446	23.3420	-7.18	60.124	3.6	16	741	1157.9	1615	943	1509.4	2051	916	25
26	26	Pon	031	20.34365	-12.23	20.3246	-18.49	0.98457	0.2056	-1.27	61.013	4.6	24	740	1158.1	1617	954	1553.1	2208	912	26
27	27	Wto	032	20.38331	-12.36	20.3656	-18.34	0.98467	1.0555	4.17	61.827	5.6	33	738	1158.3	1619	1004	1635.1	2323	908	27
28	28	Śro	033	20.42296	-12.48	20.4104	-18.18	0.98479	1.5024	9.44	62.510	6.6	42	737	1158.5	1621	1015	1716.9	****	904	28
29	29	Czw	034	20.46262	-12.59	20.4512	-18.03	0.98490	2.3522	14.42	63.024	0.2	52	735	1158.7	1623	1027	1759.4	037	900	29
30	30	Pią	035	20.50227	-13.10	20.4919	-17.46	0.98502	3.2140	19.03	63.345	1.2	61	734	1158.9	1625	1041	1843.5	150	856	30
31	31	Sob	036	20.54193	-13.19	20.5325	-17.30	0.98515	4.0957	22.38	63.467	2.2	70	732	1159.1	1626	1100	1929.9	304	852	31

Fazy Księżyca [Dm, h.mm]: Pełn 7, 16.40 3kw 15, 5.45 Now 21, 22.05 1kw 29, 7.03

STYCZEŃ 2004 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	5.51	17.48	6.52	15.04	9.53	18.30	11.15	0.05	21.51	10.59	15.28	8.05	10.17	20.10	9.35	18.27	5.43	15.09		
	18.751	-23.04	17.886	-20.27	21.120	-18.43	0.577	3.81	11.351	5.51	6.701	22.42	22.163	-12.13	20.946	-17.30	17.354	-14.39	6.66636	1
3	5.51	17.50	6.38	14.51	9.50	18.36	11.09	0.05	21.43	10.51	15.19	7.57	10.09	20.03	9.28	18.19	5.35	15.02		
	18.898	-22.86	17.790	-20.23	21.284	-17.69	0.651	4.33	11.352	5.51	6.689	22.43	22.168	-12.10	20.951	-17.28	17.359	-14.39	6.79779	3
5	5.51	17.52	6.28	14.39	9.47	18.43	11.03	0.04	21.35	10.43	15.10	7.48	10.02	19.56	9.20	18.12	5.27	14.54		
	19.045	-22.66	17.741	-20.31	21.447	-16.92	0.725	4.85	11.352	5.52	6.677	22.45	22.173	-12.06	20.955	-17.26	17.364	-14.40	6.92921	5
7	5.51	17.54	6.21	14.30	9.44	18.50	10.56	0.03	21.27	10.36	15.02	7.40	9.54	19.48	9.12	18.04	5.20	14.47		
	19.191	-22.42	17.738	-20.49	21.608	-16.12	0.799	5.37	11.351	5.54	6.665	22.46	22.179	-12.03	20.960	-17.24	17.369	-14.40	7.06063	7
9	5.50	17.56	6.17	14.22	9.40	18.57	10.50	0.03	21.19	10.28	14.53	7.32	9.46	19.41	9.04	17.57	5.12	14.39		
	19.336	-22.16	17.775	-20.75	21.767	-15.29	0.874	5.88	11.350	5.56	6.654	22.48	22.185	-12.00	20.965	-17.22	17.373	-14.41	7.19206	9
11	5.49	17.59	6.15	14.17	9.37	19.03	10.44	0.02	21.11	10.20	14.44	7.23	9.38	19.34	8.57	17.49	5.05	14.31		
	19.481	-21.87	17.845	-21.05	21.924	-14.43	0.950	6.40	11.348	5.58	6.642	22.49	22.191	-11.97	20.970	-17.20	17.378	-14.41	7.32348	11
13	5.49	18.01	6.16	14.12	9.33	19.10	10.38	0.02	21.02	10.12	14.36	7.15	9.31	19.26	8.49	17.42	4.57	14.24		
	19.626	-21.55	17.942	-21.37	22.081	-13.55	1.025	6.91	11.344	5.61	6.631	22.51	22.197	-11.93	20.974	-17.18	17.383	-14.41	7.45489	13
15	5.48	18.04	6.17	14.10	9.29	19.17	10.32	23.57	20.54	10.04	14.27	7.06	9.23	19.19	8.41	17.34	4.50	14.16		
	19.770	-21.20	18.062	-21.69	22.235	-12.64	1.101	7.42	11.341	5.65	6.620	22.52	22.203	-11.90	20.979	-17.16	17.387	-14.41	7.58631	15
17	5.46	18.06	6.20	14.08	9.25	19.23	10.26	23.57	20.46	9.56	14.18	6.58	9.15	19.12	8.34	17.27	4.42	14.09		
	19.913	-20.82	18.201	-21.98	22.389	-11.71	1.178	7.93	11.336	5.69	6.609	22.54	22.209	-11.86	20.984	-17.14	17.392	-14.42	7.71773	17
19	5.45	18.09	6.23	14.07	9.21	19.30	10.20	23.56	20.37	9.48	14.10	6.49	9.08	19.05	8.26	17.19	4.34	14.01		
	20.055	-20.42	18.354	-22.24	22.541	-10.77	1.255	8.43	11.330	5.73	6.598	22.55	22.216	-11.82	20.989	-17.12	17.396	-14.42	7.84916	19
21	5.43	18.12	6.26	14.08	9.17	19.37	10.14	23.56	20.29	9.40	14.01	6.41	8.60	18.57	8.18	17.12	4.27	13.53		
	20.196	-19.99	18.519	-22.45	22.691	-9.80	1.333	8.94	11.324	5.78	6.587	22.56	22.222	-11.79	20.994	-17.10	17.400	-14.42	7.98058	21
23	5.41	18.15	6.30	14.09	9.12	19.43	10.08	23.55	20.20	9.32	13.53	6.33	8.52	18.50	8.11	17.05	4.19	13.46		
	20.337	-19.54	18.694	-22.60	22.840	-8.82	1.411	9.43	11.317	5.83	6.577	22.58	22.229	-11.75	20.999	-17.08	17.404	-14.42	8.11200	23
25	5.39	18.18	6.34	14.12	9.08	19.50	10.02	23.55	20.12	9.24	13.44	6.24	8.45	18.43	8.03	16.57	4.12	13.38		
	20.477	-19.06	18.877	-22.68	22.989	-7.83	1.489	9.93	11.309	5.89	6.567	22.59	22.236	-11.71	21.004	-17.06	17.409	-14.42	8.24342	25
27	5.37	18.21	6.37	14.15	9.03	19.56	9.56	23.55	20.03	9.16	13.35	6.16	8.37	18.36	7.55	16.50	4.04	13.30		
	20.615	-18.56	19.068	-22.70	23.136	-6.82	1.568	10.42	11.301	5.95	6.557	22.60	22.242	-11.67	21.009	-17.04	17.413	-14.42	8.37484	27
29	5.35	18.24	6.41	14.19	8.59	20.02	9.50	23.54	19.54	9.08	13.27	6.08	8.29	18.28	7.48	16.42	3.56	13.23		
	20.753	-18.04	19.264	-22.64	23.282	-5.80	1.647	10.91	11.292	6.02	6.548	22.61	22.249	-11.63	21.014	-17.02	17.416	-14.42	8.50626	29
31	5.32	18.27	6.44	14.25	8.54	20.09	9.44	23.54	19.45	9.00	13.18	5.59	8.22	18.21	7.40	16.35	3.49	13.15		
	20.890	-17.50	19.465	-22.51	23.427	-4.77	1.726	11.39	11.282	6.09	6.539	22.63	22.256	-11.59	21.020	-16.99	17.420	-14.42	8.63768	31

LUTY 2004

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]									
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2453																			
32	1	Nie	037	20.58158	-13.28	20.5731	-17.13	0.98528	5.0029	25.16	63.398	3.2	78	731	1159.2	1628	1127	2018.9	416	848	1	
33	2	Pon	038	21.02124	-13.36	21.0135	-16.56	0.98542	5.5308	26.48	63.161	4.2	86	729	1159.3	1630	1203	2110.0	523	844	2	
34	3	Wto	039	21.06090	-13.43	21.0539	-16.39	0.98556	6.4717	27.05	62.788	5.2	92	727	1159.5	1632	1252	2202.3	620	840	3	
35	4	Śro	040	21.10055	-13.50	21.0942	-16.21	0.98571	7.4154	26.02	62.316	6.2	96	726	1159.6	1634	1356	2254.7	706	836	4	
36	5	Czw	041	21.14021	-13.55	21.1344	-16.03	0.98586	8.3556	23.42	61.782	7.2	99	724	1159.7	1636	1509	2346.0	739	832	5	
37	6	Pią	042	21.17586	-13.60	21.1745	-15.45	0.98602	9.2834	20.09	61.224	0.1	100	722	1159.7	1638	1629	*****	803	828	6	
38	7	Sob	043	21.21552	-14.04	21.2146	-15.26	0.98618	10.1929	15.36	60.671	1.1	99	720	1159.8	1640	1750	035.5	822	824	7	
39	8	Nie	044	21.25517	-14.07	21.2545	-15.07	0.98635	11.0849	10.14	60.145	2.1	95	718	1159.9	1642	1911	123.1	836	821	8	
40	9	Pon	045	21.29483	-14.09	21.2944	-14.48	0.98653	11.5711	4.20	59.659	3.1	90	717	1159.9	1644	2033	209.3	848	817	9	
41	10	Wto	046	21.33448	-14.11	21.3342	-14.29	0.98671	12.4527	-1.50	59.218	4.1	82	715	1159.9	1646	2155	254.9	900	813	10	
42	11	Śro	047	21.37414	-14.11	21.3739	-14.10	0.98689	13.3438	-8.01	58.823	5.1	73	713	1159.9	1648	2319	341.1	911	809	11	
43	12	Czw	048	21.41380	-14.11	21.4136	-13.50	0.98708	14.2552	-13.52	58.475	6.1	62	711	1159.9	1650	****	429.2	925	805	12	
44	13	Pią	049	21.45345	-14.11	21.4532	-13.30	0.98728	15.2008	-19.05	58.178	7.1	51	709	1159.9	1652	046	520.3	942	801	13	
45	14	Sob	050	21.49310	-14.09	21.4927	-13.10	0.98747	16.1804	-23.17	57.945	0.9	40	707	1159.9	1654	216	615.3	1005	757	14	
46	15	Nie	051	21.53276	-14.07	21.5321	-12.49	0.98767	17.1934	-26.05	57.794	1.9	29	705	1159.9	1656	344	714.5	1040	753	15	
47	16	Pon	052	21.57242	-14.04	21.5715	-12.29	0.98788	18.2327	-27.13	57.749	2.9	19	703	1159.8	1658	502	816.7	1130	749	16	
48	17	Wto	053	22.01208	-14.01	22.0108	-12.08	0.98808	19.2739	-26.31	57.837	3.9	11	701	1159.8	1700	603	919.7	1240	745	17	
49	18	Śro	054	22.05173	-13.56	22.0500	-11.47	0.98829	20.2954	-24.04	58.074	4.9	5	659	1159.7	1701	645	1020.7	1404	741	18	
50	19	Czw	055	22.09139	-13.51	22.0852	-11.26	0.98850	21.2836	-20.10	58.470	5.9	1	657	1159.6	1703	713	1117.8	1534	737	19	
51	20	Pią	056	22.13104	-13.46	22.1243	-11.04	0.98872	22.2313	-15.12	59.012	0.1	0	654	1159.5	1705	733	1210.4	1701	733	20	
52	21	Sob	057	22.17070	-13.39	22.1633	-10.43	0.98893	23.1407	-9.34	59.673	1.1	1	652	1159.4	1707	748	1258.9	1825	729	21	
53	22	Nie	058	22.21035	-13.32	22.2023	-10.21	0.98915	0.0207	-3.39	60.408	2.1	5	650	1159.3	1709	800	1344.2	1945	726	22	
54	23	Pon	059	22.25001	-13.25	22.2412	-9.59	0.98937	0.4814	2.17	61.163	3.1	11	648	1159.2	1711	810	1427.5	2102	722	23	
55	24	Wto	060	22.28566	-13.17	22.2760	-9.37	0.98959	1.3331	7.59	61.880	4.1	17	646	1159.0	1713	821	1510.0	2218	718	24	
56	25	Śro	061	22.32532	-13.08	22.3148	-9.15	0.98982	2.1855	13.15	62.501	5.1	26	644	1158.9	1715	832	1552.8	2333	714	25	
57	26	Czw	062	22.36497	-12.58	22.3535	-8.52	0.99004	3.0516	17.54	62.981	6.1	34	641	1158.7	1717	845	1636.8	****	710	26	
58	27	Pią	063	22.40463	-12.48	22.3921	-8.30	0.99027	3.5314	21.48	63.281	7.1	44	639	1158.6	1719	902	1722.6	047	706	27	
59	28	Sob	064	22.44428	-12.38	22.4307	-8.07	0.99050	4.4311	24.46	63.382	0.3	53	637	1158.4	1721	925	1810.7	201	702	28	
60	29	Nie	065	22.48394	-12.26	22.4653	-7.45	0.99073	5.3508	26.39	63.278	1.3	62	635	1158.2	1723	956	1900.9	311	658	29	

Fazy Księżyca [Dm, h.mm]: Pełn 6, 9.47 3kw 13, 14.39 Now 20, 10.18 1kw 28, 4.24

LUTY 2004 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	5.31	18.29	6.45	14.27	8.52	20.12	9.41	23.54	19.41	8.56	13.14	5.55	8.18	18.17	7.36	16.31	3.45	13.11		
	20.959	-17.22	19.567	-22.41	23.499	-4.26	1.766	11.63	11.277	6.13	6.534	22.63	22.260	-11.57	21.022	-16.98	17.422	-14.42	8.70339	1
3	5.28	18.32	6.48	14.34	8.47	20.18	9.35	23.54	19.32	8.48	13.06	5.47	8.10	18.10	7.28	16.24	3.37	13.04		
	21.094	-16.64	19.774	-22.15	23.643	-3.22	1.847	12.10	11.266	6.20	6.526	22.64	22.267	-11.53	21.027	-16.96	17.426	-14.42	8.83481	3
5	5.26	18.36	6.50	14.41	8.42	20.24	9.29	23.53	19.23	8.40	12.57	5.39	8.02	18.03	7.21	16.16	3.30	12.56		
	21.229	-16.05	19.983	-21.81	23.786	-2.18	1.927	12.57	11.255	6.28	6.518	22.65	22.274	-11.49	21.032	-16.94	17.429	-14.42	8.96624	5
7	5.22	18.39	6.52	14.49	8.37	20.31	9.24	23.53	19.14	8.32	12.49	5.30	7.55	17.56	7.13	16.09	3.22	12.48		
	21.363	-15.44	20.196	-21.38	23.928	-1.13	2.008	13.04	11.243	6.37	6.510	22.67	22.281	-11.45	21.037	-16.92	17.433	-14.41	9.09766	7
9	5.19	18.42	6.53	14.58	8.32	20.37	9.18	23.53	19.05	8.24	12.41	5.22	7.47	17.49	7.05	16.01	3.14	12.41		
	21.496	-14.81	20.410	-20.86	0.069	-0.08	2.089	13.50	11.230	6.45	6.503	22.68	22.288	-11.41	21.042	-16.90	17.436	-14.41	9.22907	9
11	5.16	18.46	6.54	15.07	8.27	20.43	9.12	23.53	18.56	8.15	12.32	5.14	7.39	17.41	6.58	15.54	3.06	12.33		
	21.628	-14.16	20.627	-20.25	0.210	0.97	2.171	13.95	11.217	6.54	6.496	22.69	22.295	-11.37	21.047	-16.88	17.439	-14.41	9.36049	11
13	5.13	18.49	6.55	15.17	8.22	20.49	9.06	23.52	18.47	8.07	12.24	5.06	7.32	17.34	6.50	15.47	2.59	12.25		
	21.759	-13.50	20.845	-19.56	0.350	2.01	2.253	14.40	11.204	6.64	6.490	22.69	22.303	-11.33	21.052	-16.86	17.442	-14.41	9.49191	13
15	5.09	18.53	6.55	15.27	8.17	20.55	9.01	23.52	18.37	7.59	12.16	4.58	7.24	17.27	6.42	15.39	2.51	12.18		
	21.889	-12.82	21.064	-18.78	0.490	3.06	2.336	14.84	11.190	6.73	6.484	22.70	22.310	-11.29	21.057	-16.84	17.445	-14.40	9.62333	15
17	5.05	18.56	6.55	15.38	8.12	21.01	8.55	23.52	18.28	7.51	12.07	4.50	7.16	17.20	6.34	15.32	2.43	12.10		
	22.019	-12.13	21.285	-17.90	0.630	4.10	2.419	15.27	11.175	6.83	6.479	22.71	22.317	-11.25	21.062	-16.82	17.448	-14.40	9.75475	17
19	5.01	18.60	6.54	15.50	8.07	21.07	8.50	23.52	18.19	7.43	11.59	4.41	7.09	17.13	6.27	15.24	2.36	12.02		
	22.148	-11.43	21.507	-16.93	0.769	5.14	2.502	15.69	11.160	6.92	6.474	22.72	22.324	-11.21	21.067	-16.79	17.450	-14.40	9.88617	19
21	4.57	19.04	6.53	16.02	8.02	21.13	8.44	23.51	18.09	7.34	11.51	4.33	7.01	17.05	6.19	15.17	2.28	11.55		
	22.276	-10.71	21.731	-15.88	0.908	6.16	2.586	16.11	11.145	7.02	6.470	22.73	22.332	-11.17	21.072	-16.77	17.453	-14.39	10.01759	21
23	4.53	19.07	6.51	16.14	7.56	21.19	8.39	23.51	18.00	7.26	11.43	4.25	6.53	16.58	6.11	15.09	2.20	11.47		
	22.403	-9.98	21.955	-14.73	1.047	7.18	2.670	16.53	11.130	7.13	6.466	22.74	22.339	-11.12	21.077	-16.75	17.455	-14.39	10.14901	23
25	4.49	19.11	6.50	16.27	7.51	21.25	8.34	23.51	17.51	7.18	11.35	4.17	6.46	16.51	6.04	15.02	2.12	11.39		
	22.530	-9.25	22.181	-13.49	1.186	8.19	2.755	16.93	11.114	7.23	6.463	22.74	22.346	-11.08	21.082	-16.73	17.457	-14.38	10.28042	25
27	4.45	19.15	6.48	16.41	7.46	21.31	8.28	23.51	17.41	7.10	11.27	4.09	6.38	16.44	5.56	14.54	2.05	11.32		
	22.656	-8.50	22.408	-12.16	1.324	9.19	2.840	17.33	11.098	7.33	6.460	22.75	22.354	-11.04	21.087	-16.71	17.459	-14.38	10.41184	27
29	4.40	19.18	6.45	16.55	7.41	21.37	8.23	23.51	17.32	7.01	11.19	4.01	6.30	16.37	5.48	14.47	1.57	11.24		
	22.781	-7.74	22.636	-10.74	1.463	10.17	2.926	17.71	11.082	7.43	6.458	22.76	22.361	-11.00	21.091	-16.69	17.461	-14.38	10.54326	29

MARZEC 2004

Piwnice, CA UMK				← Dane na godz. 12 czasu strefowego (= 11 lub 10 ^h UT) →										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2453																			
61	1	Pon	066	22.52360	-12.15	22.5038	-7.22	0.99097	6.2840	27.20	62.980	2.3	71	632	1158.0	1724	1040	1952.6	412	654	1	
62	2	Wto	067	22.56325	-12.03	22.5422	-6.59	0.99121	7.2258	26.44	62.513	3.3	80	630	1157.8	1726	1138	2044.8	502	650	2	
63	3	Śro	068	23.00291	-11.50	22.5806	-6.36	0.99146	8.1707	24.48	61.916	4.3	87	628	1157.6	1728	1248	2136.5	540	646	3	
64	4	Czw	069	23.04256	-11.37	23.0149	-6.13	0.99170	9.1018	21.37	61.237	5.3	93	626	1157.4	1730	1406	2226.9	607	642	4	
65	5	Pią	070	23.08222	-11.23	23.0532	-5.50	0.99196	10.0204	17.18	60.530	6.3	97	623	1157.1	1732	1528	2315.7	627	638	5	
66	6	Sob	071	23.12187	-11.09	23.0915	-5.26	0.99221	10.5227	12.04	59.846	7.3	100	621	1156.9	1734	1651	*****	642	634	6	
67	7	Nie	072	23.16153	-10.55	23.1257	-5.03	0.99247	11.4153	6.10	59.231	0.5	100	619	1156.7	1736	1814	003.1	655	630	7	
68	8	Pon	073	23.20118	-10.40	23.1639	-4.40	0.99273	12.3106	-0.09	58.723	1.5	97	616	1156.4	1738	1938	049.8	707	627	8	
69	9	Wto	074	23.24084	-10.25	23.2020	-4.16	0.99300	13.2102	-6.32	58.340	2.5	92	614	1156.2	1739	2104	136.9	718	623	9	
70	10	Śro	075	23.28049	-10.09	23.2401	-3.53	0.99327	14.1243	-12.40	58.087	3.5	85	612	1155.9	1741	2232	225.3	731	619	10	
71	11	Czw	076	23.32015	-9.53	23.2742	-3.29	0.99354	15.0704	-18.11	57.958	4.5	76	609	1155.6	1743	****	316.4	747	615	11	
72	12	Pią	077	23.35580	-9.37	23.3122	-3.06	0.99381	16.0438	-22.42	57.937	5.5	66	607	1155.4	1745	003	410.9	808	611	12	
73	13	Sob	078	23.39546	-9.21	23.3502	-2.42	0.99409	17.0522	-25.50	58.007	6.5	55	604	1155.1	1747	133	509.0	838	607	13	
74	14	Nie	079	23.43511	-9.04	23.3842	-2.18	0.99437	18.0815	-27.20	58.154	0.6	43	602	1154.8	1749	254	610.0	923	603	14	
75	15	Pon	080	23.47477	-8.48	23.4222	-1.55	0.99465	19.1127	-27.04	58.369	1.6	32	600	1154.5	1750	400	711.9	1026	559	15	
76	16	Wto	081	23.51443	-8.31	23.4602	-1.31	0.99493	20.1257	-25.05	58.650	2.6	22	557	1154.3	1752	446	812.3	1145	555	16	
77	17	Śro	082	23.55408	-8.13	23.4941	-1.07	0.99521	21.1115	-21.36	58.999	3.6	14	555	1154.0	1754	517	909.4	1311	551	17	
78	18	Czw	083	23.59374	-7.56	23.5320	-0.43	0.99549	22.0548	-16.60	59.418	4.6	7	553	1153.7	1756	539	1002.2	1438	547	18	
79	19	Pią	084	0.03339	-7.38	23.5659	-0.20	0.99577	22.5649	-11.36	59.907	5.6	2	550	1153.4	1758	554	1051.1	1602	543	19	
80	20	Sob	085	0.07305	-7.21	0.0038	0.04	0.99605	23.4502	-5.46	60.456	6.6	0	548	1153.1	1800	607	1136.8	1723	539	20	
81	21	Nie	086	0.11270	-7.03	0.0417	0.28	0.99634	0.3124	0.12	61.045	0.5	0	545	1152.8	1801	617	1220.6	1841	535	21	
82	22	Pon	087	0.15236	-6.45	0.0755	0.52	0.99662	1.1651	6.03	61.645	1.5	2	543	1152.5	1803	627	1303.3	1957	531	22	
83	23	Wto	088	0.19201	-6.27	0.1134	1.15	0.99690	2.0219	11.34	62.218	2.5	6	541	1152.2	1805	638	1346.1	2113	528	23	
84	24	Śro	089	0.23167	-6.09	0.1513	1.39	0.99718	2.4837	16.31	62.722	3.5	12	538	1151.9	1807	650	1429.8	2229	524	24	
85	25	Czw	090	0.27132	-5.51	0.1851	2.02	0.99746	3.3621	20.45	63.114	4.5	19	536	1151.6	1809	705	1515.2	2344	520	25	
86	26	Pią	091	0.31098	-5.33	0.2229	2.26	0.99774	4.2554	24.05	63.357	5.5	27	533	1151.3	1810	725	1602.6	****	516	26	
87	27	Sob	092	0.35063	-5.15	0.2608	2.49	0.99802	5.1719	26.21	63.421	6.5	36	531	1151.0	1812	752	1652.1	057	512	27	
88	28	Nie	093	0.39029	-4.57	0.2946	3.13	0.99830	6.1013	27.27	63.288	7.5	45	529	1150.7	1814	831	1743.0	202	508	28	
88	28	Nie	093	23.38530	-4.57	0.2937	3.12	0.99829	6.0760	27.26	63.298	7.5	45	629	1250.7	1914	931	1843.0	302	608	28	
89	29	Pon	094	23.42496	-4.39	0.3316	3.35	0.99857	7.0142	27.19	62.973	0.4	54	626	1250.4	1916	1022	1934.7	357	604	29	
90	30	Wto	095	23.46461	-4.21	0.3654	3.59	0.99885	7.5525	25.54	62.461	1.4	64	624	1250.1	1918	1127	2026.0	439	600	30	
91	31	Śro	096	23.50427	-4.03	0.4033	4.22	0.99913	8.4823	23.14	61.789	2.4	73	621	1249.8	1919	1241	2116.3	509	556	31	

Fazy Księżyca [Dm, h.mm]: Pełn 7, 0.14 3kw 13, 22.01 Nów 20, 23.41 Nów 21, 0.41 1kw 29, 1.48

MARZEC 2004 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.38	19.20	6.44	17.02	7.38	21.40	8.20	23.50	17.27	6.57	11.15	3.57	6.27	16.33	5.44	14.43	1.53	11.20		
	22.844	-7.36	22.751	-10.00	1.532	10.66	2.968	17.90	11.074	7.49	6.457	22.76	22.365	-10.98	21.094	-16.68	17.462	-14.37	10.60898	1
3	4.33	19.24	6.42	17.16	7.33	21.46	8.15	23.50	17.18	6.49	11.07	3.50	6.19	16.26	5.37	14.36	1.45	11.12		
	22.968	-6.60	22.981	-8.45	1.670	11.62	3.054	18.28	11.058	7.59	6.456	22.77	22.372	-10.94	21.098	-16.66	17.464	-14.37	10.74040	3
5	4.29	19.28	6.39	17.31	7.28	21.52	8.10	23.50	17.08	6.41	10.59	3.42	6.11	16.19	5.29	14.28	1.37	11.05		
	23.092	-5.83	23.212	-6.83	1.808	12.56	3.141	18.65	11.042	7.69	6.455	22.77	22.379	-10.90	21.103	-16.65	17.465	-14.36	10.87182	5
7	4.24	19.32	6.35	17.46	7.23	21.58	8.05	23.50	16.59	6.33	10.51	3.34	6.04	16.12	5.21	14.21	1.30	10.57		
	23.216	-5.05	23.445	-5.13	1.946	13.49	3.227	19.00	11.026	7.79	6.455	22.78	22.386	-10.86	21.107	-16.63	17.467	-14.36	11.00323	7
9	4.19	19.36	6.32	18.02	7.18	22.04	7.60	23.49	16.50	6.24	10.43	3.26	5.56	16.04	5.14	14.13	1.22	10.49		
	23.339	-4.27	23.678	-3.36	2.085	14.39	3.315	19.35	11.010	7.89	6.455	22.78	22.393	-10.82	21.112	-16.61	17.468	-14.35	11.13465	9
11	4.14	19.40	6.28	18.18	7.13	22.10	7.55	23.49	16.40	6.16	10.35	3.18	5.48	15.57	5.06	14.06	1.14	10.41		
	23.462	-3.49	23.910	-1.55	2.223	15.28	3.402	19.69	10.994	7.99	6.456	22.79	22.400	-10.78	21.116	-16.59	17.469	-14.35	11.26606	11
13	4.09	19.44	6.25	18.33	7.08	22.15	7.50	23.49	16.31	6.08	10.27	3.11	5.41	15.50	4.58	13.58	1.06	10.34		
	23.584	-2.70	0.141	0.31	2.361	16.14	3.490	20.02	10.978	8.09	6.457	22.79	22.407	-10.74	21.120	-16.57	17.470	-14.34	11.39748	13
15	4.04	19.48	6.20	18.49	7.03	22.21	7.45	23.48	16.22	5.59	10.19	3.03	5.33	15.43	4.50	13.51	0.58	10.26		
	23.706	-1.91	0.370	2.17	2.498	16.98	3.578	20.34	10.962	8.19	6.459	22.80	22.414	-10.70	21.124	-16.55	17.471	-14.33	11.52891	15
17	3.58	19.52	6.16	19.05	6.58	22.27	7.40	23.48	16.12	5.51	10.12	2.55	5.25	15.35	4.43	13.43	0.50	10.18		
	23.828	-1.12	0.593	4.03	2.636	17.79	3.666	20.65	10.947	8.28	6.461	22.80	22.421	-10.66	21.128	-16.54	17.471	-14.33	11.66033	17
19	3.53	19.57	6.11	19.19	6.53	22.32	7.36	23.48	16.03	5.43	10.04	2.47	5.18	15.28	4.35	13.36	0.42	10.10		
	23.950	-0.33	0.809	5.84	2.774	18.58	3.755	20.94	10.932	8.38	6.464	22.80	22.428	-10.62	21.132	-16.52	17.472	-14.32	11.79175	19
21	3.47	20.01	6.06	19.33	6.49	22.38	7.31	23.47	15.54	5.35	9.56	2.40	5.10	15.21	4.27	13.28	0.35	10.02		
	0.071	0.46	1.014	7.57	2.911	19.34	3.844	21.23	10.917	8.47	6.468	22.81	22.435	-10.58	21.136	-16.50	17.472	-14.32	11.92316	21
23	3.42	20.05	6.01	19.46	6.44	22.43	7.27	23.47	15.45	5.26	9.49	2.32	5.02	15.14	4.19	13.21	0.27	9.55		
	0.193	1.25	1.205	9.18	3.048	20.07	3.934	21.51	10.902	8.55	6.472	22.81	22.441	-10.54	21.140	-16.49	17.472	-14.31	12.05458	23
25	3.36	20.10	5.55	19.57	6.39	22.49	7.22	23.46	15.35	5.18	9.41	2.25	4.55	15.06	4.12	13.13	0.19	9.47		
	0.314	2.04	1.379	10.65	3.185	20.77	4.024	21.78	10.888	8.64	6.476	22.81	22.448	-10.51	21.143	-16.47	17.472	-14.30	12.18599	25
27	3.30	20.14	5.49	20.05	6.35	22.54	7.18	23.46	15.26	5.10	9.33	2.17	4.47	14.59	4.04	13.06	0.11	9.39		
	0.436	2.82	1.531	11.95	3.321	21.44	4.114	22.03	10.875	8.72	6.481	22.81	22.454	-10.47	21.147	-16.46	17.472	-14.30	12.31742	27
29	4.25	21.19	6.42	21.11	7.30	0.02	8.13	0.49	16.17	6.02	10.26	3.10	5.39	15.52	4.56	13.58	1.03	10.31		
	0.554	3.59	1.658	13.02	3.453	22.07	4.203	22.28	10.862	8.79	6.487	22.81	22.461	-10.43	21.150	-16.44	17.472	-14.29	12.44884	29
31	4.19	21.24	6.35	21.15	7.26	0.07	8.09	0.48	16.08	5.54	10.18	3.02	5.31	15.45	4.48	13.50	0.55	10.23		
	0.676	4.36	1.761	13.91	3.587	22.68	4.293	22.51	10.849	8.87	6.493	22.81	22.467	-10.40	21.153	-16.43	17.472	-14.28	12.58026	31

KWIECIEŃ 2004

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)											Czas strefowy [hhmm.]							
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2453																		
92	1	Czw	097	23.54393	-3.45	0.4411	4.45	0.99941	9.4009	19.24	61.000	3.4	81	619	1249.5	1921	1401	2205.2	532	552	1
93	2	Pią	098	23.58358	-3.27	0.4750	5.08	0.99970	10.3042	14.33	60.152	4.4	89	617	1249.2	1923	1523	2252.9	548	548	2
94	3	Sob	099	0.02324	-3.10	0.5129	5.31	0.99998	11.2023	8.52	59.309	5.4	95	614	1248.9	1925	1647	2340.0	602	544	3
95	4	Nie	100	0.06289	-2.52	0.5508	5.54	1.00027	12.0953	2.36	58.539	6.4	99	612	1248.6	1927	1811	*****	614	540	4
96	5	Pon	101	0.10254	-2.35	0.5847	6.17	1.00056	13.0009	-3.56	57.904	7.4	100	609	1248.3	1928	1938	027.3	625	536	5
97	6	Wto	102	0.14220	-2.18	1.0227	6.39	1.00085	13.5211	-10.24	57.450	1.0	99	607	1248.0	1930	2108	116.0	637	533	6
98	7	Śro	103	0.18185	-2.01	1.0606	7.02	1.00114	14.4656	-16.23	57.203	2.0	95	605	1247.8	1932	2241	207.4	652	529	7
99	8	Czw	104	0.22151	-1.44	1.0946	7.24	1.00143	15.4505	-21.27	57.165	3.0	88	602	1247.5	1934	****	302.2	711	525	8
100	9	Pią	105	0.26117	-1.28	1.1326	7.47	1.00172	16.4635	-25.11	57.317	4.0	80	600	1247.2	1935	015	400.9	738	521	9
101	10	Sob	106	0.30082	-1.11	1.1707	8.09	1.00201	17.5025	-27.15	57.623	5.0	70	558	1246.9	1937	143	502.8	818	517	10
102	11	Nie	107	0.34048	-0.56	1.2047	8.31	1.00230	18.5438	-27.28	58.044	6.0	58	555	1246.7	1939	256	605.9	916	513	11
103	12	Pon	108	0.38013	-0.40	1.2428	8.53	1.00259	19.5702	-25.54	58.539	0.3	47	553	1246.4	1941	348	707.4	1032	509	12
104	13	Wto	109	0.41579	-0.25	1.2810	9.14	1.00288	20.5601	-22.48	59.073	1.3	36	551	1246.2	1943	423	805.4	1157	505	13
105	14	Śro	110	0.45545	-0.10	1.3151	9.36	1.00317	21.5055	-18.30	59.625	2.3	26	549	1245.9	1944	446	858.8	1323	501	14
106	15	Czw	111	0.49510	0.05	1.3533	9.58	1.00346	22.4200	-13.21	60.177	3.3	17	546	1245.7	1946	503	948.0	1447	457	15
107	16	Pią	112	0.53476	0.19	1.3916	10.19	1.00374	23.3005	-7.42	60.723	4.3	10	544	1245.4	1948	516	1033.7	1607	453	16
108	17	Sob	113	0.57441	0.33	1.4258	10.40	1.00402	0.1607	-1.49	61.258	5.3	5	542	1245.2	1950	526	1117.2	1724	449	17
109	18	Nie	114	1.01407	0.46	1.4642	11.01	1.00430	1.0108	4.03	61.774	6.3	1	540	1245.0	1952	536	1159.5	1840	445	18
110	19	Pon	115	1.05372	0.59	1.5025	11.22	1.00458	1.4605	9.40	62.262	7.3	0	537	1244.8	1953	546	1241.7	1956	441	19
111	20	Wto	116	1.09338	1.11	1.5409	11.42	1.00486	2.3148	14.51	62.706	0.9	1	535	1244.6	1955	557	1324.8	2112	437	20
112	21	Śro	117	1.13303	1.24	1.5754	12.03	1.00513	3.1858	19.23	63.084	1.9	3	533	1244.4	1957	611	1409.4	2228	434	21
113	22	Czw	118	1.17269	1.35	2.0139	12.23	1.00540	4.0757	23.04	63.369	2.9	7	531	1244.2	1959	629	1456.2	2342	430	22
114	23	Pią	119	1.21234	1.46	2.0524	12.43	1.00566	4.5849	25.45	63.533	3.9	13	529	1244.0	2001	652	1544.9	****	426	23
115	24	Sob	120	1.25200	1.57	2.0910	13.02	1.00593	5.5116	27.17	63.548	4.9	20	526	1243.8	2002	726	1635.4	051	422	24
116	25	Nie	121	1.29165	2.08	2.1256	13.22	1.00619	6.4435	27.35	63.394	5.9	28	524	1243.6	2004	812	1726.6	150	418	25
117	26	Pon	122	1.33131	2.17	2.1643	13.41	1.00645	7.3754	26.36	63.055	6.9	37	522	1243.5	2006	911	1817.5	237	414	26
118	27	Wto	123	1.37097	2.27	2.2030	14.00	1.00670	8.3025	24.22	62.532	7.9	47	520	1243.3	2008	1021	1907.4	311	410	27
119	28	Śro	124	1.41062	2.36	2.2418	14.19	1.00696	9.2139	20.59	61.838	0.7	57	518	1243.2	2009	1137	1955.9	336	406	28
120	29	Czw	125	1.45028	2.44	2.2806	14.38	1.00721	10.1133	16.34	61.005	1.7	67	516	1243.0	2011	1257	2042.9	354	402	29
121	30	Pią	126	1.48593	2.52	2.3154	14.56	1.00746	11.0028	11.17	60.080	2.7	76	514	1242.9	2013	1418	2129.2	408	358	30

Fazy Księżyca [Dm, h.mm]: Pełn 5, 13.03 3kw 12, 5.46 Nów 19, 15.21 1kw 27, 19.32

MAJ 2004

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2453																					
122	1	Sob	127	1.52559	2.59	2.3544	15.14	1.00771	11.4908	5.19	59.126	3.7	85	512	1242.8	2015	1541	2215.5	420	354	1
123	2	Nie	128	1.56524	3.06	2.3933	15.32	1.00796	12.3827	-1.05	58.217	4.7	92	510	1242.6	2016	1706	2303.0	431	350	2
124	3	Pon	129	2.00490	3.12	2.4324	15.50	1.00821	13.2933	-7.38	57.432	5.7	97	508	1242.5	2018	1834	2353.1	443	346	3
125	4	Wto	130	2.04455	3.18	2.4714	16.07	1.00846	14.2334	-13.58	56.841	6.7	100	506	1242.4	2020	2007	*****	456	342	4
126	5	Śro	131	2.08421	3.23	2.5106	16.24	1.00870	15.2125	-19.35	56.495	0.6	100	504	1242.4	2022	2144	047.0	513	338	5
127	6	Czw	132	2.12386	3.28	2.5458	16.41	1.00895	16.2323	-24.00	56.420	1.6	96	502	1242.3	2023	2319	145.5	536	335	6
128	7	Pią	133	2.16352	3.32	2.5850	16.58	1.00919	17.2841	-26.47	56.610	2.6	91	500	1242.2	2025	****	248.4	611	331	7
129	8	Sob	134	2.20318	3.35	3.0243	17.14	1.00943	18.3513	-27.37	57.030	3.6	82	459	1242.2	2027	042	353.6	704	327	8
130	9	Nie	135	2.24283	3.38	3.0637	17.30	1.00967	19.4018	-26.31	57.626	4.6	72	457	1242.1	2028	145	458.3	816	323	9
131	10	Pon	136	2.28249	3.40	3.1031	17.46	1.00991	20.4143	-23.43	58.337	5.6	62	455	1242.1	2030	226	559.4	941	319	10
132	11	Wto	137	2.32214	3.42	3.1426	18.01	1.01014	21.3829	-19.36	59.101	6.6	51	453	1242.0	2032	253	655.4	1109	315	11
133	12	Śro	138	2.36180	3.43	3.1822	18.16	1.01037	22.3045	-14.36	59.867	1.0	40	452	1242.0	2034	311	746.2	1234	311	12
134	13	Czw	139	2.40146	3.44	3.2218	18.31	1.01060	23.1922	-9.02	60.597	2.0	30	450	1242.0	2035	325	832.9	1355	307	13
135	14	Pią	140	2.44111	3.44	3.2614	18.45	1.01083	0.0527	-3.13	61.268	3.0	21	448	1242.0	2037	336	916.6	1513	303	14
136	15	Sob	141	2.48077	3.43	3.3012	18.60	1.01105	0.5009	2.37	61.866	4.0	13	447	1242.0	2038	346	958.6	1629	259	15
137	16	Nie	142	2.52042	3.42	3.3409	19.13	1.01126	1.3433	8.16	62.385	5.0	7	445	1242.1	2040	355	1040.3	1743	255	16
138	17	Pon	143	2.56008	3.40	3.3808	19.27	1.01148	2.1934	13.31	62.824	6.0	3	444	1242.1	2042	406	1122.5	1858	251	17
139	18	Wto	144	2.59573	3.37	3.4207	19.40	1.01168	3.0558	18.12	63.180	7.0	1	442	1242.1	2043	418	1206.3	2014	247	18
140	19	Śro	145	3.03539	3.35	3.4606	19.53	1.01189	3.5414	22.08	63.451	0.2	0	441	1242.2	2045	434	1252.0	2129	243	19
141	20	Czw	146	3.07504	3.31	3.5006	20.06	1.01208	4.4433	25.06	63.627	1.2	1	439	1242.2	2046	456	1340.0	2240	240	20
142	21	Pią	147	3.11470	3.27	3.5407	20.18	1.01228	5.3637	26.58	63.696	2.2	4	438	1242.3	2048	526	1429.9	2343	236	21
143	22	Sob	148	3.15436	3.22	3.5808	20.29	1.01247	6.2945	27.36	63.642	3.2	9	437	1242.4	2049	607	1520.9	****	232	22
144	23	Nie	149	3.19401	3.17	4.0210	20.41	1.01265	7.2259	26.58	63.450	4.2	15	435	1242.5	2051	701	1611.9	034	228	23
145	24	Pon	150	3.23367	3.12	4.0612	20.52	1.01283	8.1524	25.05	63.104	5.2	23	434	1242.5	2052	808	1701.8	112	224	24
146	25	Wto	151	3.27332	3.06	4.1014	21.03	1.01300	9.0621	22.04	62.599	6.2	31	433	1242.6	2053	921	1750.0	139	220	25
147	26	Śro	152	3.31298	2.59	4.1417	21.13	1.01317	9.5542	18.02	61.936	7.2	41	432	1242.8	2055	1038	1836.5	159	216	26
148	27	Czw	153	3.35264	2.52	4.1821	21.23	1.01334	10.4343	13.08	61.132	0.1	51	430	1242.9	2056	1157	1921.6	215	212	27
149	28	Pią	154	3.39229	2.45	4.2225	21.33	1.01350	11.3104	7.32	60.219	1.1	61	429	1243.0	2057	1316	2006.4	227	208	28
150	29	Sob	155	3.43195	2.37	4.2629	21.42	1.01366	12.1841	1.26	59.247	2.1	71	428	1243.1	2059	1437	2051.8	238	204	29
151	30	Nie	156	3.47160	2.29	4.3034	21.51	1.01382	13.0742	-4.56	58.282	3.1	81	427	1243.3	2100	1601	2139.3	249	200	30
152	31	Pon	157	3.51126	2.20	4.3439	21.60	1.01397	13.5923	-11.16	57.402	4.1	89	426	1243.4	2101	1730	2230.3	301	156	31

Fazy Księżyca [Dm, h.mm]: Pełn 4, 22.34 3kw 11, 13.04 Now 19, 6.52 1kw 27, 9.57

MAJ 2004 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	2.30	22.60	4.51	18.06	6.26	0.35	7.16	0.29	13.56	3.48	8.26	1.09	3.32	13.50	2.48	11.52	22.47	8.20		
	2.595	15.24	1.349	6.52	5.355	27.75	5.723	24.61	10.737	9.46	6.644	22.76	22.547	-9.95	21.188	-16.28	17.448	-14.18	14.61725	1
3	2.21	23.09	4.46	17.59	6.22	0.32	7.14	0.27	13.48	3.40	8.19	1.02	3.24	13.42	2.40	11.44	22.39	8.13		
	2.723	15.83	1.377	6.29	5.431	27.80	5.817	24.65	10.735	9.46	6.657	22.75	22.551	-9.92	21.189	-16.28	17.445	-14.18	14.74866	3
5	2.12	23.18	4.41	17.53	6.18	0.28	7.11	0.24	13.40	3.32	8.12	0.55	3.16	13.35	2.32	11.36	22.31	8.05		
	2.852	16.41	1.423	6.22	5.498	27.81	5.910	24.67	10.735	9.46	6.670	22.74	22.554	-9.90	21.190	-16.27	17.443	-14.17	14.88008	5
7	2.02	23.28	4.37	17.50	6.14	0.24	7.09	0.22	13.33	3.25	8.05	0.47	3.09	13.27	2.24	11.28	22.23	7.57		
	2.981	16.96	1.485	6.31	5.558	27.80	6.003	24.68	10.735	9.45	6.684	22.73	22.558	-9.88	21.191	-16.27	17.440	-14.17	15.01151	7
9	1.51	23.40	4.32	17.48	6.10	0.18	7.06	0.20	13.25	3.17	7.58	0.40	3.01	13.20	2.16	11.20	22.15	7.49		
	3.110	17.50	1.564	6.56	5.608	27.75	6.096	24.67	10.736	9.44	6.698	22.72	22.561	-9.87	21.192	-16.27	17.437	-14.16	15.14293	9
11	1.38	23.54	4.28	17.48	6.05	0.12	7.04	0.17	13.17	3.09	7.51	0.33	2.53	13.12	2.09	11.13	22.07	7.41		
	3.241	18.02	1.656	6.94	5.649	27.67	6.189	24.66	10.738	9.42	6.712	22.71	22.564	-9.85	21.192	-16.27	17.434	-14.16	15.27435	11
13	1.22	0.25	4.23	17.49	6.00	0.05	7.02	0.15	13.10	3.01	7.44	0.26	2.45	13.05	2.01	11.05	21.59	7.32		
	3.372	18.52	1.763	7.45	5.680	27.55	6.281	24.63	10.741	9.40	6.727	22.70	22.567	-9.83	21.192	-16.27	17.431	-14.16	15.40577	13
15	*****	*****	4.19	17.52	5.55	23.53	7.00	0.12	13.02	2.53	7.37	0.19	2.37	12.57	1.53	10.57	21.51	7.24		
	3.503	18.99	1.883	8.08	5.700	27.41	6.374	24.58	10.744	9.37	6.741	22.69	22.570	-9.82	21.193	-16.27	17.428	-14.15	15.53719	15
17	*****	*****	4.15	17.56	5.49	23.44	6.58	0.09	12.55	2.45	7.30	0.12	2.30	12.49	1.45	10.49	21.43	7.16		
	3.636	19.45	2.014	8.81	5.710	27.22	6.467	24.53	10.748	9.34	6.757	22.68	22.573	-9.80	21.193	-16.27	17.425	-14.15	15.66861	17
19	*****	*****	4.11	18.01	5.43	23.34	6.57	0.07	12.47	2.38	7.24	0.05	2.22	12.42	1.37	10.41	21.35	7.08		
	3.768	19.88	2.158	9.64	5.707	27.01	6.560	24.46	10.753	9.30	6.772	22.66	22.575	-9.79	21.193	-16.27	17.422	-14.14	15.80003	19
21	*****	*****	4.07	18.08	5.37	23.23	6.55	0.04	12.40	2.30	7.17	23.54	2.14	12.34	1.29	10.33	21.27	7.00		
	3.902	20.29	2.313	10.55	5.693	26.75	6.652	24.39	10.759	9.26	6.788	22.65	22.577	-9.78	21.192	-16.27	17.419	-14.14	15.93145	21
23	*****	*****	4.04	18.16	5.30	23.11	6.53	23.57	12.33	2.22	7.10	23.47	2.06	12.26	1.21	10.25	21.18	6.52		
	4.036	20.68	2.480	11.53	5.667	26.46	6.744	24.29	10.765	9.22	6.804	22.64	22.579	-9.77	21.192	-16.27	17.415	-14.14	16.06287	23
25	*****	*****	4.01	18.25	5.23	22.58	6.52	23.53	12.26	2.14	7.03	23.40	1.58	12.19	1.13	10.17	21.10	6.44		
	4.171	21.05	2.658	12.57	5.629	26.12	6.836	24.19	10.772	9.17	6.820	22.62	22.581	-9.76	21.192	-16.27	17.412	-14.13	16.19430	25
27	*****	*****	3.58	18.35	5.16	22.43	6.50	23.50	12.19	2.07	6.56	23.33	1.51	12.11	1.06	10.10	21.02	6.36		
	4.306	21.39	2.848	13.66	5.580	25.75	6.928	24.08	10.780	9.12	6.836	22.61	22.583	-9.75	21.191	-16.28	17.409	-14.13	16.32572	27
29	*****	*****	3.55	18.46	5.08	22.28	6.49	23.47	12.11	1.59	6.50	23.26	1.43	12.03	0.58	10.02	20.54	6.28		
	4.441	21.70	3.050	14.79	5.521	25.33	7.020	23.95	10.788	9.06	6.853	22.59	22.584	-9.75	21.190	-16.28	17.405	-14.13	16.45713	29
31	*****	*****	3.53	18.58	4.60	22.13	6.48	23.43	12.04	1.51	6.43	23.19	1.35	11.55	0.50	9.54	20.46	6.20		
	4.578	21.99	3.265	15.94	5.452	24.87	7.111	23.81	10.797	9.00	6.870	22.57	22.585	-9.74	21.189	-16.28	17.402	-14.13	16.58855	31

CZERWIEC 2004

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2453																					
153	1	Wto	158	3.55091	2.11	4.3845	22.08	1.01412	14.5457	-17.12	56.686	5.1	95	426	1243.6	2102	1905	2326.1	315	152	1
154	2	Śro	159	3.59057	2.02	4.4251	22.15	1.01427	15.5514	-22.12	56.207	6.1	99	425	1243.7	2103	2042	*****	335	148	2
155	3	Czw	160	4.03023	1.52	4.4657	22.23	1.01442	17.0005	-25.46	56.015	0.2	100	424	1243.9	2104	2214	027.3	403	144	3
156	4	Pią	161	4.06588	1.42	4.5104	22.30	1.01456	18.0755	-27.28	56.125	1.2	98	423	1244.0	2106	2329	133.0	447	141	4
157	5	Sob	162	4.10554	1.31	4.5511	22.36	1.01470	19.1552	-27.05	56.523	2.2	92	422	1244.2	2107	****	240.3	553	137	5
158	6	Nie	163	4.14519	1.21	4.5918	22.42	1.01483	20.2055	-24.46	57.159	3.2	85	422	1244.4	2107	022	345.6	716	133	6
159	7	Pon	164	4.18485	1.10	5.0326	22.48	1.01497	21.2111	-20.55	57.965	4.2	76	421	1244.6	2108	055	446.0	847	129	7
160	8	Wto	165	4.22451	0.58	5.0734	22.54	1.01510	22.1617	-15.59	58.865	5.2	65	421	1244.8	2109	117	540.5	1017	125	8
161	9	Śro	166	4.26416	0.46	5.1142	22.59	1.01522	23.0654	-10.24	59.787	6.2	54	420	1245.0	2110	132	629.9	1142	121	9
162	10	Czw	167	4.30382	0.35	5.1550	23.03	1.01534	23.5414	-4.33	60.670	0.6	44	420	1245.2	2111	144	715.2	1302	117	10
163	11	Pią	168	4.34347	0.22	5.1959	23.07	1.01546	0.3932	1.21	61.470	1.6	34	420	1245.4	2112	155	758.1	1418	113	11
164	12	Sob	169	4.38313	0.10	5.2408	23.11	1.01557	1.2360	7.03	62.159	2.6	25	419	1245.6	2112	204	839.9	1533	109	12
165	13	Nie	170	4.42278	-0.03	5.2817	23.14	1.01568	2.0842	12.23	62.723	3.6	17	419	1245.8	2113	215	921.7	1648	105	13
166	14	Pon	171	4.46244	-0.15	5.3227	23.17	1.01578	2.5430	17.11	63.158	4.6	10	419	1246.0	2114	226	1004.7	1803	101	14
167	15	Wto	172	4.50209	-0.28	5.3636	23.20	1.01588	3.4205	21.16	63.468	5.6	5	419	1246.2	2114	241	1049.6	1917	057	15
168	16	Śro	173	4.54175	-0.41	5.4046	23.22	1.01597	4.3145	24.27	63.660	6.6	2	419	1246.4	2115	301	1136.6	2030	053	16
169	17	Czw	174	4.58141	-0.54	5.4455	23.24	1.01605	5.2322	26.34	63.741	7.6	0	419	1246.7	2115	327	1226.2	2136	049	17
170	18	Pią	175	5.02106	-1.07	5.4905	23.25	1.01613	6.1621	27.30	63.715	0.6	0	419	1246.9	2115	405	1316.8	2231	045	18
171	19	Sob	176	5.06072	-1.21	5.5315	23.26	1.01621	7.0942	27.09	63.582	1.6	2	419	1247.1	2116	455	1408.0	2313	042	19
172	20	Nie	177	5.10038	-1.34	5.5724	23.26	1.01627	8.0224	25.33	63.338	2.6	6	419	1247.3	2116	558	1458.3	2343	038	20
173	21	Pon	178	5.14003	-1.47	6.0134	23.26	1.01633	8.5338	22.48	62.979	3.6	11	419	1247.5	2116	710	1546.9	****	034	21
174	22	Wto	179	5.17569	-1.60	6.0544	23.26	1.01639	9.4302	19.00	62.498	4.6	18	419	1247.7	2116	826	1633.5	005	030	22
175	23	Śro	180	5.21534	-2.13	6.0953	23.25	1.01644	10.3045	14.22	61.894	5.6	26	420	1248.0	2116	943	1718.4	021	026	23
176	24	Czw	181	5.25500	-2.26	6.1403	23.24	1.01648	11.1718	9.02	61.173	6.6	36	420	1248.2	2116	1100	1802.1	034	022	24
177	25	Pią	182	5.29465	-2.39	6.1812	23.22	1.01652	12.0334	3.13	60.353	7.6	46	420	1248.4	2116	1218	1845.8	045	018	25
178	26	Sob	183	5.33431	-2.51	6.2221	23.20	1.01656	12.5036	-2.55	59.465	0.6	57	421	1248.6	2116	1339	1930.7	056	014	26
179	27	Nie	184	5.37397	-3.04	6.2630	23.18	1.01659	13.3939	-9.06	58.558	1.6	67	421	1248.8	2116	1502	2018.3	106	010	27
180	28	Pon	185	5.41362	-3.16	6.3039	23.15	1.01661	14.3201	-15.01	57.694	2.6	78	422	1249.0	2116	1631	2110.1	119	006	28
181	29	Wto	186	5.45328	-3.28	6.3447	23.12	1.01664	15.2852	-20.18	56.947	3.6	87	422	1249.2	2116	1805	2207.2	135	002	29
182	30	Śro	187	5.49293	-3.40	6.3856	23.08	1.01666	16.3047	-24.27	56.391	4.6	94	423	1249.4	2115	1940	2309.9	158	2354	30

Fazy Księżyca [Dm, h.mm]: Pełn 3, 6.20 3kw 9, 22.02 Now 17, 22.27 1kw 25, 21.08

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Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0 ^h UT)	
1	*****	*****	3.52	19.04	4.56	22.04	6.47	23.41	12.01	1.48	6.40	23.15	1.31	11.52	0.46	9.50	20.42	6.16		
	4.646	22.13	3.377	16.53	5.415	24.62	7.157	23.74	10.802	8.97	6.878	22.56	22.586	-9.74	21.189	-16.29	17.400	-14.13	16.65426	1
3	*****	*****	3.51	19.18	4.47	21.47	6.46	23.38	11.54	1.40	6.33	23.09	1.23	11.44	0.38	9.42	20.34	6.08		
	4.782	22.38	3.611	17.69	5.335	24.11	7.248	23.58	10.812	8.90	6.895	22.54	22.586	-9.74	21.188	-16.29	17.396	-14.12	16.78569	3
5	*****	*****	3.50	19.33	4.39	21.30	6.45	23.34	11.47	1.32	6.26	23.02	1.15	11.36	0.30	9.34	20.26	5.60		
	4.920	22.60	3.859	18.84	5.251	23.56	7.339	23.41	10.822	8.83	6.912	22.53	22.587	-9.73	21.186	-16.30	17.393	-14.12	16.91711	5
7	*****	*****	3.50	19.48	4.30	21.13	6.44	23.30	11.41	1.25	6.20	22.55	1.08	11.28	0.22	9.26	20.18	5.52		
	5.057	22.80	4.121	19.96	5.164	22.99	7.430	23.24	10.833	8.75	6.930	22.51	22.588	-9.73	21.185	-16.30	17.389	-14.12	17.04853	7
9	*****	*****	3.51	20.04	4.22	20.55	6.43	23.26	11.34	1.17	6.13	22.48	0.60	11.20	0.14	9.18	20.10	5.44		
	5.195	22.98	4.397	21.02	5.076	22.40	7.520	23.05	10.845	8.68	6.947	22.49	22.588	-9.73	21.184	-16.31	17.386	-14.12	17.17996	9
11	*****	*****	3.53	20.21	4.13	20.38	6.42	23.22	11.27	1.09	6.06	22.41	0.52	11.12	0.06	9.10	20.02	5.36		
	5.333	23.12	4.686	22.00	4.991	21.81	7.610	22.84	10.858	8.59	6.965	22.46	22.588	-9.73	21.182	-16.32	17.382	-14.12	17.31137	11
13	*****	*****	3.57	20.37	4.05	20.21	6.41	23.18	11.21	1.02	5.60	22.34	0.44	11.05	23.54	9.02	19.54	5.28		
	5.471	23.24	4.986	22.86	4.910	21.23	7.700	22.63	10.871	8.51	6.983	22.44	22.588	-9.74	21.180	-16.33	17.379	-14.12	17.44279	13
15	*****	*****	4.02	20.54	3.56	20.04	6.40	23.14	11.14	0.54	5.53	22.27	0.36	10.57	23.47	8.54	19.46	5.20		
	5.610	23.33	5.297	23.59	4.835	20.67	7.789	22.41	10.884	8.42	7.001	22.42	22.587	-9.74	21.178	-16.34	17.375	-14.12	17.57421	15
17	*****	*****	4.08	21.10	3.48	19.49	6.39	23.10	11.07	0.47	5.46	22.20	0.28	10.49	23.39	8.46	19.37	5.11		
	5.749	23.40	5.614	24.16	4.768	20.14	7.879	22.18	10.898	8.33	7.019	22.40	22.587	-9.74	21.176	-16.35	17.371	-14.12	17.70564	17
19	*****	*****	4.17	21.24	3.40	19.34	6.39	23.05	11.01	0.39	5.40	22.13	0.20	10.41	23.31	8.38	19.29	5.03		
	5.887	23.43	5.935	24.55	4.709	19.65	7.968	21.93	10.913	8.23	7.037	22.37	22.586	-9.75	21.174	-16.36	17.368	-14.12	17.83706	19
21	*****	*****	4.26	21.37	3.32	19.20	6.38	23.01	10.55	0.32	5.33	22.06	0.13	10.33	23.23	8.30	19.21	4.55		
	6.026	23.44	6.256	24.76	4.661	19.20	8.056	21.68	10.928	8.13	7.055	22.35	22.585	-9.76	21.172	-16.37	17.364	-14.13	17.96849	21
23	*****	*****	4.37	21.48	3.25	19.07	6.37	22.56	10.48	0.24	5.27	21.59	0.05	10.25	23.15	8.21	19.13	4.47		
	6.165	23.42	6.573	24.78	4.622	18.81	8.145	21.41	10.944	8.03	7.073	22.33	22.584	-9.76	21.170	-16.38	17.361	-14.13	18.09991	23
25	*****	*****	4.49	21.58	3.18	18.55	6.37	22.52	10.42	0.17	5.20	21.52	23.53	10.17	23.07	8.13	19.05	4.39		
	6.303	23.37	6.884	24.61	4.595	18.46	8.232	21.14	10.960	7.93	7.092	22.30	22.583	-9.77	21.167	-16.39	17.357	-14.13	18.23133	25
27	*****	*****	5.02	22.05	3.11	18.45	6.36	22.47	10.36	0.09	5.13	21.45	23.45	10.09	22.59	8.05	18.57	4.31		
	6.442	23.30	7.185	24.28	4.578	18.18	8.320	20.85	10.977	7.82	7.110	22.27	22.581	-9.78	21.165	-16.40	17.354	-14.13	18.36274	27
29	*****	*****	5.16	22.11	3.04	18.35	6.36	22.42	10.29	0.02	5.07	21.38	23.37	10.01	22.51	7.57	18.49	4.23		
	6.580	23.20	7.476	23.79	4.572	17.95	8.407	20.56	10.994	7.71	7.129	22.25	22.579	-9.80	21.162	-16.41	17.350	-14.13	18.49417	29

LIPIEC 2004

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2453																					
183	1	Czw	188	5.53259	-3.51	6.4304	23.04	1.01667	17.3708	-26.58	56.087	5.6	98	424	1249.6	2115	2104	*****	233	2350	1
184	2	Pią	189	5.57225	-4.02	6.4712	22.60	1.01668	18.4542	-27.28	56.075	6.6	100	425	1249.8	2115	2209	016.7	328	2347	2
185	3	Sob	190	6.01190	-4.13	6.5119	22.55	1.01669	19.5317	-25.54	56.363	1.0	99	425	1250.0	2114	2251	124.3	444	2343	3
186	4	Nie	191	6.05156	-4.24	6.5526	22.50	1.01670	20.5705	-22.31	56.922	2.0	94	426	1250.1	2114	2319	228.7	615	2339	4
187	5	Pon	192	6.09122	-4.34	6.5933	22.44	1.01670	21.5548	-17.47	57.696	3.0	88	427	1250.3	2113	2337	327.8	749	2335	5
188	6	Wto	193	6.13087	-4.44	7.0340	22.38	1.01669	22.4932	-12.12	58.611	4.0	79	428	1250.5	2112	2351	421.0	919	2331	6
189	7	Śro	194	6.17053	-4.54	7.0746	22.32	1.01669	23.3914	-6.13	59.585	5.0	69	429	1250.6	2112	****	509.5	1044	2327	7
190	8	Czw	195	6.21018	-5.03	7.1152	22.25	1.01668	0.2611	-0.10	60.546	6.0	59	430	1250.8	2111	002	554.5	1204	2323	8
191	9	Pią	196	6.24584	-5.12	7.1557	22.18	1.01666	1.1139	5.43	61.429	0.1	49	431	1250.9	2110	012	637.5	1321	2319	9
192	10	Sob	197	6.28549	-5.20	7.2002	22.10	1.01665	1.5647	11.13	62.191	1.1	39	432	1251.1	2109	022	719.9	1436	2315	10
193	11	Nie	198	6.32515	-5.28	7.2407	22.02	1.01662	2.4235	16.12	62.802	2.1	30	433	1251.2	2108	034	802.8	1552	2311	11
194	12	Pon	199	6.36480	-5.36	7.2811	21.54	1.01659	3.2950	20.27	63.251	3.1	21	434	1251.3	2108	047	847.2	1707	2307	12
195	13	Wto	200	6.40446	-5.43	7.3215	21.45	1.01656	4.1901	23.51	63.537	4.1	14	436	1251.5	2107	105	933.6	1820	2303	13
196	14	Śro	201	6.44412	-5.50	7.3618	21.36	1.01652	5.1010	26.13	63.671	5.1	8	437	1251.6	2105	129	1022.3	1928	2259	14
197	15	Czw	202	6.48377	-5.56	7.4021	21.26	1.01647	6.0254	27.25	63.667	6.1	4	438	1251.7	2104	203	1112.7	2027	2255	15
198	16	Pią	203	6.52343	-6.02	7.4423	21.17	1.01642	6.5622	27.21	63.543	7.1	1	439	1251.8	2103	250	1204.0	2113	2251	16
199	17	Sob	204	6.56309	-6.07	7.4825	21.06	1.01636	7.4929	26.01	63.316	8.1	0	441	1251.9	2102	350	1254.9	2146	2248	17
200	18	Nie	205	7.00274	-6.12	7.5226	20.56	1.01630	8.4121	23.28	62.998	0.9	1	442	1251.9	2101	500	1344.3	2210	2244	18
201	19	Pon	206	7.04240	-6.16	7.5627	20.45	1.01623	9.3124	19.51	62.598	1.9	4	443	1252.0	2100	615	1431.8	2228	2240	19
202	20	Wto	207	7.08205	-6.19	8.0027	20.34	1.01615	10.1934	15.21	62.123	2.9	8	445	1252.1	2058	733	1517.2	2242	2236	20
203	21	Śro	208	7.12171	-6.22	8.0426	20.22	1.01607	11.0614	10.08	61.574	3.9	14	446	1252.1	2057	850	1601.0	2253	2232	21
204	22	Czw	209	7.16136	-6.25	8.0825	20.10	1.01598	11.5207	4.26	60.955	4.9	22	448	1252.2	2056	1007	1644.2	2303	2228	22
205	23	Pią	210	7.20102	-6.27	8.1223	19.58	1.01589	12.3811	-1.34	60.274	5.9	32	449	1252.2	2054	1125	1727.8	2314	2224	23
206	24	Sob	211	7.24067	-6.28	8.1621	19.45	1.01579	13.2534	-7.38	59.548	6.9	42	451	1252.2	2053	1246	1813.1	2325	2220	24
207	25	Nie	212	7.28033	-6.28	8.2018	19.32	1.01569	14.1529	-13.30	58.802	0.3	53	452	1252.2	2051	1411	1901.6	2339	2216	25
208	26	Pon	213	7.31598	-6.28	8.2415	19.19	1.01558	15.0908	-18.51	58.079	1.3	64	454	1252.2	2050	1540	1954.5	2358	2212	26
209	27	Wto	214	7.35564	-6.28	8.2811	19.05	1.01547	16.0726	-23.17	57.429	2.3	75	455	1252.2	2048	1711	2052.9	0**	2208	27
210	28	Śro	215	7.39530	-6.26	8.3206	18.51	1.01536	17.1026	-26.20	56.912	3.3	84	457	1252.2	2046	1839	2156.2	026	2204	28
211	29	Czw	216	7.43495	-6.24	8.3601	18.37	1.01524	18.1653	-27.35	56.586	4.3	92	458	1252.2	2045	1952	2302.3	110	2200	29
212	30	Pią	217	7.47461	-6.22	8.3955	18.23	1.01512	19.2415	-26.51	56.497	5.3	97	500	1252.1	2043	2044	*****	215	2156	30
213	31	Sob	218	7.51427	-6.19	8.4348	18.08	1.01499	20.2936	-24.09	56.669	6.3	100	502	1252.1	2041	2117	008.0	339	2152	31

Fazy Księżyca [Dm, h.mm]: Pełn 2, 13.09 3kw 9, 9.33 Nów 17, 13.24 1kw 25, 5.37 Pełn 31, 20.05

LIPIEC 2004 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	*****	*****	5.29	22.15	2.58	18.26	6.35	22.37	10.23	23.51	5.00	21.31	23.29	9.53	22.43	7.49	18.41	4.15		
	6.718	23.07	7.754	23.17	4.576	17.77	8.494	20.26	11.011	7.59	7.147	22.22	22.577	-9.81	21.159	-16.42	17.347	-14.14	18.62559	1
3	*****	*****	5.43	22.17	2.51	18.18	6.35	22.32	10.17	23.43	4.54	21.24	23.21	9.45	22.35	7.41	18.33	4.07		
	6.855	22.92	8.020	22.42	4.590	17.65	8.581	19.94	11.030	7.48	7.166	22.19	22.575	-9.82	21.156	-16.44	17.344	-14.14	18.75701	3
5	*****	*****	5.57	22.18	2.46	18.11	6.34	22.28	10.11	23.36	4.47	21.17	23.13	9.37	22.27	7.33	18.25	3.59		
	6.993	22.73	8.273	21.58	4.614	17.57	8.667	19.62	11.048	7.36	7.184	22.16	22.573	-9.84	21.154	-16.45	17.340	-14.15	18.88844	5
7	*****	*****	6.10	22.18	2.40	18.05	6.34	22.23	10.05	23.28	4.41	21.10	23.05	9.29	22.19	7.25	18.17	3.51		
	7.129	22.53	8.512	20.65	4.648	17.54	8.753	19.29	11.067	7.23	7.203	22.13	22.571	-9.85	21.151	-16.46	17.337	-14.15	19.01986	7
9	*****	*****	6.23	22.16	2.34	17.60	6.33	22.18	9.59	23.21	4.34	21.03	22.57	9.20	22.11	7.17	18.09	3.43		
	7.266	22.29	8.739	19.66	4.690	17.55	8.839	18.95	11.086	7.11	7.221	22.11	22.568	-9.87	21.148	-16.48	17.334	-14.15	19.15127	9
11	*****	*****	6.35	22.14	2.29	17.55	6.33	22.12	9.53	23.14	4.28	20.56	22.50	9.12	22.03	7.08	18.01	3.34		
	7.402	22.03	8.953	18.61	4.740	17.59	8.924	18.61	11.106	6.98	7.240	22.08	22.565	-9.89	21.144	-16.49	17.331	-14.16	19.28269	11
13	*****	*****	6.46	22.11	2.24	17.51	6.33	22.07	9.47	23.06	4.21	20.49	22.42	9.04	21.55	7.00	17.53	3.26		
	7.537	21.75	9.154	17.51	4.797	17.66	9.009	18.25	11.126	6.85	7.259	22.05	22.562	-9.90	21.141	-16.51	17.328	-14.16	19.41411	13
15	*****	*****	6.57	22.07	2.20	17.48	6.32	22.02	9.41	22.59	4.15	20.42	22.34	8.56	21.47	6.52	17.45	3.18		
	7.672	21.44	9.344	16.39	4.862	17.76	9.094	17.89	11.146	6.72	7.277	22.01	22.559	-9.92	21.138	-16.52	17.325	-14.17	19.54554	15
17	*****	*****	7.07	22.03	2.15	17.45	6.32	21.57	9.35	22.51	4.08	20.35	22.26	8.48	21.39	6.44	17.37	3.10		
	7.807	21.11	9.521	15.26	4.934	17.89	9.178	17.52	11.167	6.58	7.295	21.98	22.556	-9.94	21.135	-16.54	17.322	-14.18	19.67696	17
19	*****	*****	7.16	21.58	2.11	17.43	6.31	21.52	9.29	22.44	4.02	20.28	22.18	8.40	21.31	6.36	17.29	3.02		
	7.941	20.75	9.686	14.11	5.012	18.03	9.262	17.14	11.188	6.45	7.314	21.95	22.552	-9.97	21.131	-16.55	17.320	-14.18	19.80838	19
21	*****	*****	7.24	21.53	2.07	17.41	6.31	21.46	9.24	22.37	3.55	20.21	22.10	8.31	21.23	6.28	17.21	2.54		
	8.074	20.37	9.840	12.98	5.096	18.18	9.345	16.75	11.210	6.31	7.332	21.92	22.549	-9.99	21.128	-16.57	17.317	-14.19	19.93980	21
23	*****	*****	7.31	21.47	2.04	17.40	6.31	21.41	9.18	22.29	3.48	20.14	22.02	8.23	21.15	6.20	17.13	2.46		
	8.207	19.96	9.981	11.86	5.185	18.34	9.429	16.36	11.232	6.17	7.351	21.89	22.545	-10.01	21.124	-16.58	17.314	-14.20	20.07122	23
25	*****	*****	7.37	21.40	2.00	17.39	6.30	21.35	9.12	22.22	3.42	20.07	21.54	8.15	21.07	6.11	17.05	2.38		
	8.338	19.54	10.109	10.76	5.279	18.51	9.512	15.95	11.254	6.02	7.369	21.85	22.541	-10.03	21.121	-16.60	17.312	-14.20	20.20264	25
27	*****	*****	7.42	21.33	1.57	17.38	6.30	21.30	9.06	22.15	3.35	20.00	21.46	8.07	20.59	6.03	16.57	2.30		
	8.470	19.09	10.224	9.71	5.378	18.68	9.595	15.55	11.276	5.88	7.387	21.82	22.537	-10.06	21.117	-16.61	17.310	-14.21	20.33406	27
29	1.16	0.04	7.46	21.26	1.55	17.37	6.30	21.24	9.01	22.07	3.29	19.53	21.38	7.58	20.52	5.55	16.49	2.22		
	8.600	18.62	10.326	8.71	5.482	18.85	9.677	15.13	11.299	5.73	7.405	21.79	22.533	-10.08	21.114	-16.63	17.307	-14.22	20.46548	29
31	1.38	-0.08	7.48	21.18	1.52	17.37	6.29	21.19	8.55	22.00	3.22	19.46	21.30	7.50	20.44	5.47	16.41	2.14		
	8.730	18.13	10.413	7.77	5.590	19.02	9.759	14.71	11.322	5.58	7.423	21.75	22.529	-10.11	21.110	-16.65	17.305	-14.23	20.59691	31

SIERPIEŃ 2004

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2453																		
214	1	Nie	219	7.55392	-6.15	8.4741	17.53	1.01487	21.3051	-19.52	57.100	0.7	99	503	1252.0	2040	2139	110.0	514	2149	1
215	2	Pon	220	7.59358	-6.11	8.5133	17.37	1.01474	22.2723	-14.28	57.756	1.7	96	505	1251.9	2038	2155	206.7	648	2145	2
216	3	Wto	221	8.03323	-6.06	8.5525	17.22	1.01460	23.1939	-8.26	58.579	2.7	90	506	1251.8	2036	2207	258.4	817	2141	3
217	4	Śro	222	8.07289	-6.00	8.5916	17.06	1.01447	0.0841	-2.11	59.499	3.7	83	508	1251.8	2034	2218	346.0	941	2137	4
218	5	Czw	223	8.11254	-5.54	9.0306	16.50	1.01433	0.5543	3.57	60.439	4.7	74	510	1251.6	2032	2228	431.0	1102	2133	5
219	6	Pią	224	8.15220	-5.47	9.0656	16.33	1.01419	1.4154	9.45	61.328	5.7	65	511	1251.5	2030	2239	514.7	1220	2129	6
220	7	Sob	225	8.19185	-5.40	9.1045	16.16	1.01404	2.2818	14.60	62.110	6.7	55	513	1251.4	2029	2252	558.3	1337	2125	7
221	8	Nie	226	8.23151	-5.32	9.1434	15.59	1.01389	3.1543	19.32	62.740	0.5	45	515	1251.3	2027	2308	642.8	1453	2121	8
222	9	Pon	227	8.27116	-5.24	9.1822	15.42	1.01374	4.0446	23.13	63.194	1.5	36	516	1251.1	2025	2330	729.0	1608	2117	9
223	10	Wto	228	8.31082	-5.15	9.2210	15.24	1.01358	4.5539	25.52	63.460	2.5	27	518	1251.0	2023	****	817.2	1719	2113	10
224	11	Śro	229	8.35048	-5.05	9.2557	15.07	1.01342	5.4808	27.22	63.544	3.5	19	520	1250.8	2021	001	907.2	1821	2109	11
225	12	Czw	230	8.39013	-4.55	9.2943	14.48	1.01325	6.4134	27.37	63.462	4.5	12	522	1250.7	2019	043	958.4	1911	2105	12
226	13	Pią	231	8.42579	-4.45	9.3329	14.30	1.01308	7.3459	26.35	63.237	5.5	7	523	1250.5	2017	139	1049.6	1949	2101	13
227	14	Sob	232	8.46544	-4.34	9.3715	14.12	1.01290	8.2726	24.18	62.898	6.5	3	525	1250.3	2014	247	1139.8	2016	2057	14
228	15	Nie	233	8.50510	-4.22	9.4060	13.53	1.01272	9.1817	20.53	62.474	7.5	0	527	1250.1	2012	402	1228.5	2035	2054	15
229	16	Pon	234	8.54475	-4.10	9.4444	13.34	1.01253	10.0719	16.30	61.993	0.4	0	528	1249.9	2010	520	1314.8	2050	2050	16
230	17	Wto	235	8.58441	-3.57	9.4828	13.15	1.01234	10.5444	11.21	61.477	1.4	2	530	1249.7	2008	638	1359.6	2101	2046	17
231	18	Śro	236	9.02407	-3.44	9.5211	12.55	1.01214	11.4109	5.39	60.943	2.4	6	532	1249.5	2006	756	1443.3	2112	2042	18
232	19	Czw	237	9.06372	-3.30	9.5554	12.36	1.01194	12.2722	-0.23	60.401	3.4	12	533	1249.2	2004	915	1526.9	2122	2038	19
233	20	Pią	238	9.10337	-3.16	9.5936	12.16	1.01174	13.1424	-6.29	59.857	4.4	19	535	1249.0	2002	1035	1611.6	2132	2034	20
234	21	Sob	239	9.14303	-3.01	10.0318	11.56	1.01153	14.0322	-12.25	59.320	5.4	28	537	1248.8	1959	1158	1658.6	2145	2030	21
235	22	Nie	240	9.18268	-2.46	10.0659	11.36	1.01131	14.5522	-17.51	58.797	6.4	39	539	1248.5	1957	1325	1749.2	2202	2026	22
236	23	Pon	241	9.22234	-2.30	10.1040	11.16	1.01109	15.5117	-22.27	58.305	7.4	50	540	1248.3	1955	1454	1844.3	2225	2022	23
237	24	Wto	242	9.26200	-2.14	10.1421	10.55	1.01087	16.5127	-25.49	57.870	1.0	61	542	1248.0	1953	1622	1944.1	2301	2018	24
238	25	Śro	243	9.30165	-1.58	10.1801	10.34	1.01065	17.5509	-27.35	57.524	2.0	72	544	1247.7	1950	1739	2047.3	2356	2014	25
239	26	Czw	244	9.34131	-1.41	10.2141	10.13	1.01042	19.0033	-27.29	57.304	3.0	82	545	1247.4	1948	1837	2151.5	****	2010	26
240	27	Pią	245	9.38097	-1.23	10.2520	9.52	1.01019	20.0509	-25.29	57.246	4.0	90	547	1247.1	1946	1916	2253.7	111	2006	27
241	28	Sob	246	9.42062	-1.06	10.2859	9.31	1.00996	21.0649	-21.48	57.379	5.0	96	549	1246.8	1944	1942	2351.8	241	2002	28
242	29	Nie	247	9.46028	-0.48	10.3237	9.10	1.00973	22.0429	-16.48	57.712	6.0	99	551	1246.5	1941	2000	*****	414	1958	29
243	30	Pon	248	9.49593	-0.29	10.3615	8.48	1.00950	22.5811	-10.56	58.236	0.3	100	552	1246.2	1939	2013	045.4	546	1955	30
244	31	Wto	249	9.53559	-0.10	10.3953	8.27	1.00926	23.4838	-4.39	58.917	1.3	98	554	1245.9	1937	2024	134.9	713	1951	31

Fazy Księżyca [Dm, h.mm]: Pełn 0, 20.05 3kw 8, 0.01 Now 16, 3.24 1kw 23, 12.12 Pełn 30, 4.22

SIERPIEŃ 2004 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE			MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)		
1	1.45	23.53	7.49	21.14	1.51	17.37	6.29	21.16	8.52	21.57	3.19	19.43	21.26	7.46	20.40	5.43	16.37	2.10			
	8.795	17.88	10.451	7.33	5.645	19.10	9.800	14.50	11.333	5.51	7.432	21.74	22.527	-10.12	21.108	-16.65	17.304	-14.23	20.66262	1	
3	1.58	23.41	7.50	21.05	1.49	17.37	6.29	21.10	8.46	21.49	3.13	19.36	21.18	7.38	20.32	5.35	16.29	2.02			
	8.924	17.36	10.514	6.51	5.759	19.25	9.882	14.07	11.357	5.36	7.449	21.70	22.522	-10.15	21.105	-16.67	17.302	-14.24	20.79404	3	
5	2.10	23.30	7.48	20.56	1.47	17.37	6.28	21.05	8.41	21.42	3.06	19.28	21.10	7.30	20.24	5.26	16.21	1.54			
	9.052	16.83	10.560	5.80	5.876	19.40	9.963	13.63	11.380	5.21	7.467	21.67	22.518	-10.17	21.101	-16.69	17.300	-14.25	20.92546	5	
7	2.19	23.20	7.45	20.47	1.45	17.37	6.28	20.59	8.35	21.35	2.59	19.21	21.02	7.21	20.16	5.18	16.13	1.46			
	9.179	16.27	10.588	5.22	5.997	19.53	10.045	13.19	11.404	5.05	7.484	21.64	22.513	-10.20	21.097	-16.70	17.299	-14.26	21.05687	7	
9	2.28	23.11	7.40	20.37	1.44	17.38	6.28	20.54	8.30	21.27	2.53	19.14	20.54	7.13	20.08	5.10	16.06	1.38			
	9.306	15.70	10.596	4.77	6.121	19.64	10.126	12.74	11.428	4.89	7.502	21.60	22.509	-10.23	21.094	-16.72	17.297	-14.27	21.18829	9	
11	2.37	23.02	7.33	20.27	1.43	17.38	6.27	20.48	8.24	21.20	2.46	19.07	20.46	7.05	19.60	5.02	15.58	1.30			
	9.432	15.11	10.584	4.50	6.248	19.74	10.206	12.29	11.452	4.74	7.519	21.57	22.504	-10.26	21.090	-16.73	17.296	-14.28	21.31972	11	
13	2.45	22.54	7.24	20.16	1.43	17.39	6.27	20.42	8.18	21.13	2.40	19.00	20.38	6.56	19.52	4.54	15.50	1.22			
	9.558	14.50	10.550	4.40	6.378	19.82	10.287	11.83	11.477	4.58	7.536	21.53	22.499	-10.29	21.087	-16.75	17.294	-14.29	21.45114	13	
15	2.52	22.46	7.12	20.06	1.42	17.39	6.26	20.36	8.13	21.06	2.33	18.53	20.30	6.48	19.44	4.46	15.42	1.14			
	9.683	13.88	10.495	4.50	6.510	19.87	10.367	11.36	11.501	4.42	7.552	21.50	22.494	-10.31	21.083	-16.77	17.293	-14.30	21.58256	15	
17	2.59	22.38	6.58	19.55	1.42	17.39	6.26	20.31	8.07	20.58	2.26	18.46	20.22	6.40	19.36	4.37	15.34	1.06			
	9.808	13.25	10.421	4.81	6.644	19.90	10.447	10.90	11.526	4.26	7.569	21.46	22.490	-10.34	21.080	-16.78	17.292	-14.31	21.71398	17	
19	3.06	22.30	6.42	19.45	1.43	17.40	6.26	20.25	8.02	20.51	2.20	18.39	20.14	6.31	19.28	4.29	15.26	0.58			
	9.932	12.60	10.331	5.32	6.781	19.90	10.527	10.42	11.551	4.09	7.585	21.43	22.485	-10.37	21.076	-16.80	17.291	-14.32	21.84539	19	
21	3.13	22.23	6.25	19.35	1.43	17.40	6.25	20.19	7.56	20.44	2.13	18.32	20.06	6.23	19.20	4.21	15.18	0.50			
	10.055	11.93	10.231	6.01	6.920	19.88	10.607	9.95	11.576	3.93	7.601	21.40	22.480	-10.40	21.073	-16.81	17.290	-14.34	21.97681	21	
23	3.19	22.16	6.06	19.25	1.44	17.40	6.25	20.13	7.51	20.37	2.06	18.24	19.58	6.15	19.12	4.13	15.10	0.42			
	10.178	11.26	10.126	6.86	7.061	19.83	10.687	9.46	11.602	3.77	7.617	21.36	22.475	-10.43	21.069	-16.83	17.290	-14.35	22.10823	23	
25	3.25	22.09	5.47	19.16	1.45	17.40	6.25	20.07	7.46	20.29	1.60	18.17	19.50	6.06	19.04	4.05	15.03	0.34			
	10.300	10.57	10.025	7.80	7.203	19.75	10.766	8.98	11.627	3.60	7.633	21.33	22.470	-10.46	21.066	-16.84	17.289	-14.36	22.23965	25	
27	3.31	22.02	5.28	19.09	1.47	17.40	6.24	20.01	7.40	20.22	1.53	18.10	19.42	5.58	18.56	3.57	14.55	0.26			
	10.422	9.87	9.936	8.77	7.346	19.65	10.845	8.49	11.653	3.43	7.648	21.29	22.465	-10.49	21.062	-16.86	17.289	-14.37	22.37107	27	
29	3.36	21.55	5.11	19.02	1.48	17.40	6.24	19.56	7.35	20.15	1.46	18.03	19.34	5.50	18.48	3.48	14.47	0.18			
	10.544	9.17	9.869	9.72	7.492	19.51	10.925	8.00	11.678	3.27	7.663	21.26	22.460	-10.52	21.059	-16.87	17.289	-14.38	22.50249	29	
31	3.42	21.49	4.56	18.57	1.51	17.40	6.23	19.50	7.29	20.08	1.40	17.56	19.26	5.41	18.40	3.40	14.39	0.10			
	10.665	8.45	9.830	10.56	7.638	19.33	11.004	7.50	11.704	3.10	7.678	21.23	22.455	-10.55	21.056	-16.89	17.289	-14.40	22.63391	31	

WRZESIEŃ 2004

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)											Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2453																			
245	1	Śro	250	9.57524	0.09	10.4330	8.05	1.00903	0.3655	1.42	59.706	2.3	93	556	1245.6	1934	2034	221.4	836	1947	1	
246	2	Czw	251	10.01490	0.28	10.4708	7.43	1.00879	1.2406	7.47	60.541	3.3	87	557	1245.3	1932	2045	306.3	957	1943	2	
247	3	Pią	252	10.05455	0.48	10.5045	7.21	1.00855	2.1112	13.23	61.356	4.3	79	559	1245.0	1930	2057	350.8	1116	1939	3	
248	4	Sob	253	10.09420	1.08	10.5421	6.59	1.00831	2.5903	18.18	62.091	5.3	71	601	1244.6	1927	2112	435.7	1235	1935	4	
249	5	Nie	254	10.13386	1.28	10.5758	6.37	1.00807	3.4816	22.21	62.694	6.3	62	603	1244.3	1925	2131	522.0	1352	1931	5	
250	6	Pon	255	10.17352	1.48	11.0134	6.14	1.00782	4.3908	25.22	63.126	7.3	52	604	1243.9	1922	2158	610.0	1506	1927	6	
251	7	Wto	256	10.21317	2.08	11.0510	5.52	1.00757	5.3130	27.15	63.366	0.8	43	606	1243.6	1920	2235	659.8	1613	1923	7	
252	8	Śro	257	10.25283	2.29	11.0846	5.29	1.00733	6.2451	27.52	63.405	1.8	33	608	1243.3	1918	2326	750.8	1708	1919	8	
253	9	Czw	258	10.29248	2.50	11.1222	5.07	1.00707	7.1820	27.12	63.253	2.8	25	609	1242.9	1915	****	842.2	1750	1915	9	
254	10	Pią	259	10.33214	3.11	11.1558	4.44	1.00682	8.1107	25.17	62.931	3.8	17	611	1242.6	1913	030	932.8	1820	1911	10	
255	11	Sob	260	10.37180	3.32	11.1933	4.21	1.00656	9.0229	22.10	62.472	4.8	10	613	1242.2	1910	143	1022.0	1841	1907	11	
256	12	Nie	261	10.41145	3.53	11.2309	3.58	1.00630	9.5212	18.01	61.917	5.8	5	615	1241.9	1908	301	1109.4	1857	1903	12	
257	13	Pon	262	10.45111	4.14	11.2644	3.35	1.00604	10.4023	13.00	61.310	6.8	2	616	1241.5	1906	420	1155.1	1909	1859	13	
258	14	Wto	263	10.49076	4.35	11.3019	3.12	1.00577	11.2732	7.20	60.693	7.8	0	618	1241.2	1903	540	1239.6	1920	1856	14	
259	15	Śro	264	10.53042	4.56	11.3355	2.49	1.00550	12.1424	1.14	60.102	0.8	1	620	1240.8	1901	700	1323.9	1930	1852	15	
260	16	Czw	265	10.57007	5.18	11.3730	2.26	1.00523	13.0153	-5.01	59.567	1.8	4	621	1240.5	1858	821	1408.9	1941	1848	16	
261	17	Pią	266	11.00573	5.39	11.4105	2.03	1.00495	13.5103	-11.09	59.104	2.8	9	623	1240.1	1856	944	1455.8	1952	1844	17	
262	18	Sob	267	11.04538	6.00	11.4440	1.40	1.00467	14.4254	-16.50	58.721	3.8	16	625	1239.7	1854	1111	1545.8	2007	1840	18	
263	19	Nie	268	11.08504	6.22	11.4815	1.16	1.00439	15.3814	-21.42	58.417	4.8	25	627	1239.4	1851	1241	1639.9	2028	1836	19	
264	20	Pon	269	11.12469	6.43	11.5151	0.53	1.00411	16.3724	-25.23	58.189	5.8	36	628	1239.0	1849	1410	1738.1	2059	1832	20	
265	21	Wto	270	11.16435	7.04	11.5526	0.30	1.00382	17.3947	-27.31	58.034	6.8	47	630	1238.7	1846	1531	1839.7	2147	1828	21	
266	22	Śro	271	11.20400	7.25	11.5902	0.06	1.00354	18.4350	-27.52	57.955	0.8	59	632	1238.3	1844	1634	1942.5	2254	1824	22	
267	23	Czw	272	11.24366	7.46	12.0237	-0.17	1.00325	19.4720	-26.23	57.959	1.8	70	633	1238.0	1841	1718	2043.9	****	1820	23	
268	24	Pią	273	11.28332	8.07	12.0613	-0.40	1.00296	20.4819	-23.13	58.060	2.8	80	635	1237.6	1839	1746	2141.9	018	1816	24	
269	25	Sob	274	11.32297	8.28	12.0948	-1.04	1.00268	21.4543	-18.40	58.270	3.8	88	637	1237.3	1837	1806	2235.6	149	1812	25	
270	26	Nie	275	11.36263	8.49	12.1324	-1.27	1.00239	22.3925	-13.09	58.599	4.8	94	639	1236.9	1834	1820	2325.5	319	1808	26	
271	27	Pon	276	11.40228	9.09	12.1701	-1.50	1.00210	23.3001	-7.02	59.050	5.8	98	640	1236.6	1832	1831	****	447	1804	27	
272	28	Wto	277	11.44194	9.29	12.2037	-2.14	1.00181	0.1829	-0.42	59.610	6.8	100	642	1236.3	1829	1841	012.5	611	1801	28	
273	29	Śro	278	11.48159	9.49	12.2413	-2.37	1.00153	1.0551	5.33	60.253	0.9	99	644	1235.9	1827	1852	057.7	732	1757	29	
274	30	Czw	279	11.52125	10.09	12.2750	-3.00	1.00124	1.5305	11.25	60.941	1.9	96	646	1235.6	1825	1903	142.3	853	1753	30	

Fazy Księżyca [Dm, h.mm]: 3kw 6, 17.10 Nów 14, 16.29 1kw 21, 17.53 Pełn 28, 15.09

WRZESIEŃ 2004 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	3.44	21.45	4.50	18.54	1.52	17.40	6.23	19.47	7.27	20.04	1.36	17.52	19.22	5.37	18.36	3.36	14.35	0.06		
	10.725	8.08	9.823	10.93	7.711	19.24	11.043	7.25	11.717	3.01	7.686	21.21	22.452	-10.56	21.054	-16.89	17.289	-14.40	22.69962	1
3	3.50	21.39	4.39	18.51	1.54	17.39	6.23	19.41	7.21	19.57	1.29	17.45	19.14	5.29	18.28	3.28	14.28	23.54		
	10.846	7.35	9.836	11.53	7.859	19.02	11.122	6.75	11.743	2.85	7.700	21.18	22.447	-10.59	21.051	-16.91	17.289	-14.42	22.83103	3
5	3.55	21.33	4.32	18.48	1.57	17.39	6.22	19.35	7.16	19.50	1.23	17.38	19.06	5.21	18.20	3.20	14.20	23.46		
	10.966	6.61	9.884	11.93	8.008	18.77	11.201	6.24	11.769	2.68	7.714	21.15	22.442	-10.62	21.048	-16.92	17.289	-14.43	22.96245	5
7	3.60	21.26	4.28	18.46	1.60	17.38	6.22	19.29	7.10	19.43	1.16	17.30	18.58	5.12	18.12	3.12	14.12	23.38		
	11.086	5.87	9.969	12.09	8.158	18.48	11.279	5.74	11.795	2.51	7.728	21.12	22.437	-10.65	21.045	-16.93	17.289	-14.44	23.09387	7
9	4.05	21.20	4.28	18.45	2.03	17.37	6.22	19.23	7.05	19.35	1.09	17.23	18.50	5.04	18.04	3.04	14.04	23.30		
	11.206	5.11	10.087	12.01	8.308	18.16	11.358	5.23	11.821	2.34	7.742	21.08	22.432	-10.68	21.042	-16.95	17.290	-14.46	23.22530	9
11	4.09	21.14	4.31	18.44	2.07	17.36	6.21	19.17	6.60	19.28	1.02	17.16	18.42	4.56	17.56	2.56	13.57	23.23		
	11.326	4.35	10.234	11.67	8.459	17.81	11.436	4.72	11.848	2.17	7.755	21.05	22.427	-10.70	21.039	-16.96	17.291	-14.47	23.35672	11
13	4.14	21.08	4.36	18.43	2.10	17.34	6.21	19.11	6.54	19.21	0.55	17.08	18.34	4.47	17.48	2.47	13.49	23.15		
	11.446	3.59	10.407	11.09	8.610	17.42	11.515	4.20	11.874	1.99	7.768	21.02	22.423	-10.73	21.037	-16.97	17.292	-14.48	23.48813	13
15	4.18	21.02	4.45	18.42	2.14	17.33	6.20	19.05	6.49	19.14	0.48	17.01	18.26	4.39	17.40	2.39	13.41	23.07		
	11.565	2.82	10.599	10.29	8.761	17.01	11.594	3.68	11.900	1.82	7.781	20.99	22.418	-10.76	21.034	-16.98	17.293	-14.50	23.61955	15
17	4.23	20.57	4.55	18.41	2.18	17.31	6.20	18.59	6.43	19.07	0.42	16.54	18.18	4.31	17.32	2.31	13.33	22.59		
	11.685	2.05	10.806	9.30	8.913	16.56	11.672	3.17	11.927	1.65	7.793	20.97	22.413	-10.78	21.032	-16.99	17.294	-14.51	23.75096	17
19	4.27	20.51	5.06	18.40	2.23	17.29	6.20	18.53	6.38	18.59	0.35	16.46	18.10	4.22	17.24	2.23	13.26	22.51		
	11.804	1.27	11.022	8.14	9.064	16.08	11.751	2.65	11.953	1.48	7.805	20.94	22.409	-10.81	21.029	-17.00	17.295	-14.52	23.88238	19
21	4.31	20.45	5.19	18.38	2.27	17.27	6.19	18.48	6.33	18.52	0.28	16.39	18.02	4.14	17.16	2.15	13.18	22.43		
	11.924	0.49	11.244	6.85	9.216	15.56	11.829	2.13	11.980	1.31	7.816	20.91	22.404	-10.83	21.027	-17.01	17.297	-14.54	0.01381	21
23	4.36	20.40	5.32	18.36	2.32	17.25	6.19	18.42	6.27	18.45	0.21	16.32	17.54	4.06	17.08	2.07	13.10	22.35		
	12.044	-0.28	11.469	5.46	9.368	15.02	11.908	1.61	12.006	1.14	7.827	20.88	22.400	-10.86	21.025	-17.02	17.298	-14.55	0.14523	23
25	4.40	20.34	5.45	18.34	2.36	17.23	6.19	18.36	6.22	18.38	0.14	16.24	17.46	3.58	17.01	1.59	13.03	22.27		
	12.163	-1.06	11.693	3.99	9.519	14.45	11.986	1.08	12.033	0.97	7.838	20.86	22.395	-10.88	21.023	-17.03	17.300	-14.57	0.27665	25
27	4.44	20.29	5.59	18.31	2.41	17.20	6.18	18.30	6.17	18.31	0.06	16.17	17.38	3.49	16.53	1.51	12.55	22.20		
	12.283	-1.84	11.916	2.47	9.671	13.85	12.065	0.56	12.059	0.79	7.848	20.83	22.391	-10.91	21.021	-17.04	17.302	-14.58	0.40806	27
29	4.48	20.24	6.13	18.28	2.46	17.18	6.18	18.24	6.11	18.23	23.55	16.09	17.30	3.41	16.45	1.43	12.47	22.12		
	12.404	-2.62	12.137	0.93	9.822	13.22	12.144	0.03	12.086	0.62	7.858	20.81	22.387	-10.93	21.019	-17.05	17.304	-14.60	0.53948	29

PAŹDZIERNIK 2004

Piwnice, CA UMK			← Dane na godz. 12 czasu strefowego (= 10 lub 11 ^b UT) →									 Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2453																		
275	1	Pią	280	11.56090	10.28	12.3127	-3.24	1.00096	2.4102	16.41	61.626	2.9	91	647	1235.3	1822	1916	227.3	1013	1749	1
276	2	Sob	281	12.00056	10.48	12.3505	-3.47	1.00068	3.3017	21.08	62.257	3.9	85	649	1235.0	1820	1933	313.5	1132	1745	2
277	3	Nie	282	12.04021	11.06	12.3843	-4.10	1.00039	4.2109	24.35	62.785	4.9	77	651	1234.6	1817	1956	401.4	1249	1741	3
278	4	Pon	283	12.07587	11.25	12.4221	-4.33	1.00011	5.1331	26.54	63.165	5.9	69	653	1234.3	1815	2029	451.0	1400	1737	4
279	5	Wto	284	12.11552	11.43	12.4559	-4.56	0.99983	6.0652	27.57	63.366	6.9	60	654	1234.0	1813	2115	542.0	1500	1733	5
280	6	Śro	285	12.15518	12.01	12.4938	-5.19	0.99955	7.0025	27.43	63.368	7.9	50	656	1233.7	1810	2214	633.4	1548	1729	6
281	7	Czw	286	12.19483	12.18	12.5317	-5.42	0.99927	7.5317	26.12	63.165	1.0	41	658	1233.4	1808	2323	724.2	1622	1725	7
282	8	Pią	287	12.23449	12.35	12.5657	-6.05	0.99899	8.4449	23.30	62.771	2.0	31	700	1233.2	1806	****	813.7	1646	1721	8
283	9	Sob	288	12.27415	12.51	13.0037	-6.28	0.99871	9.3442	19.42	62.212	3.0	23	702	1232.9	1803	039	901.4	1703	1717	9
284	10	Nie	289	12.31380	13.07	13.0418	-6.51	0.99843	10.2305	14.59	61.529	4.0	15	703	1232.6	1801	157	947.4	1717	1713	10
285	11	Pon	290	12.35346	13.22	13.0759	-7.13	0.99814	11.1026	9.31	60.774	5.0	8	705	1232.4	1759	317	1032.3	1728	1709	11
286	12	Wto	291	12.39311	13.37	13.1141	-7.36	0.99786	11.5729	3.30	60.006	6.0	3	707	1232.1	1756	437	1116.7	1738	1705	12
287	13	Śro	292	12.43277	13.52	13.1523	-7.58	0.99758	12.4510	-2.50	59.284	7.0	1	709	1231.9	1754	558	1201.8	1748	1702	13
288	14	Czw	293	12.47242	14.05	13.1905	-8.21	0.99729	13.3430	-9.11	58.660	0.3	0	711	1231.7	1752	722	1248.7	1759	1658	14
289	15	Pią	294	12.51208	14.19	13.2249	-8.43	0.99701	14.2634	-15.12	58.173	1.3	2	712	1231.4	1750	850	1338.7	1813	1654	15
290	16	Sob	295	12.55173	14.32	13.2633	-9.05	0.99672	15.2213	-20.30	57.847	2.3	7	714	1231.2	1747	1022	1432.7	1832	1650	16
291	17	Nie	296	12.59139	14.44	13.3017	-9.27	0.99644	16.2148	-24.39	57.684	3.3	14	716	1231.0	1745	1154	1531.1	1900	1646	17
292	18	Pon	297	13.03104	14.55	13.3402	-9.49	0.99615	17.2443	-27.15	57.672	4.3	23	718	1230.8	1743	1321	1633.0	1942	1642	18
293	19	Wto	298	13.07070	15.06	13.3748	-10.10	0.99586	18.2920	-28.02	57.787	5.3	33	720	1230.6	1741	1431	1736.4	2044	1638	19
294	20	Śro	299	13.11036	15.17	13.4134	-10.32	0.99558	19.3320	-26.57	58.004	6.3	44	722	1230.5	1738	1520	1838.5	2204	1634	20
295	21	Czw	300	13.15001	15.26	13.4521	-10.53	0.99529	20.3436	-24.09	58.296	0.5	56	723	1230.3	1736	1552	1937.0	2332	1630	21
296	22	Pią	301	13.18567	15.35	13.4908	-11.14	0.99501	21.3201	-19.58	58.647	1.5	67	725	1230.2	1734	1613	2031.1	****	1626	22
297	23	Sob	302	13.22532	15.44	13.5256	-11.36	0.99473	22.2531	-14.45	59.045	2.5	77	727	1230.0	1732	1628	2121.0	102	1622	23
298	24	Nie	303	13.26498	15.51	13.5645	-11.56	0.99445	23.1543	-8.53	59.485	3.5	85	729	1229.9	1730	1640	2207.7	228	1618	24
299	25	Pon	304	13.30463	15.58	14.0035	-12.17	0.99418	0.0339	-2.42	59.964	4.5	92	731	1229.8	1728	1650	2252.4	352	1614	25
300	26	Wto	305	13.34429	16.05	14.0425	-12.37	0.99390	0.5024	3.31	60.480	5.5	97	733	1229.7	1726	1700	2336.3	512	1610	26
301	27	Śro	306	13.38394	16.10	14.0816	-12.58	0.99363	1.3659	9.29	61.025	6.5	99	735	1229.6	1724	1710	*****	632	1606	27
302	28	Czw	307	13.42360	16.15	14.1207	-13.18	0.99336	2.2418	14.57	61.580	0.3	100	737	1229.5	1722	1722	020.5	751	1603	28
303	29	Pią	308	13.46325	16.19	14.1560	-13.38	0.99310	3.1301	19.43	62.123	1.3	98	738	1229.4	1720	1737	106.0	911	1559	29
304	30	Sob	309	13.50291	16.23	14.1953	-13.57	0.99284	4.0330	23.33	62.622	2.3	95	740	1229.4	1718	1758	153.2	1029	1555	30
305	31	Nie	310	13.54256	16.25	14.2347	-14.17	0.99258	4.5540	26.17	63.039	3.3	90	742	1229.3	1716	1826	242.4	1144	1551	31
305	31	Nie	310	14.54355	16.25	14.2357	-14.18	0.99257	4.5752	26.22	63.054	3.3	90	642	1129.3	1616	1726	142.4	1044	1451	31

Fazy Księżyca [Dm, h.mm]: 3kw 6, 12.12 Now 14, 4.48 1kw 20, 23.59 Pełn 28, 5.07 Pełn 28, 4.07

PAŹDZIERNIK 2004 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST Zach (0^h UT) Dm	
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach		
1	4.52	20.19	6.26	18.25	2.51	17.15	6.17	18.18	6.06	18.16	23.48	16.02	17.22	3.33	16.37	1.35	12.40	22.04		
	12.524	-3.40	12.355	-0.62	9.973	12.56	12.223	-0.49	12.112	0.45	7.868	20.79	22.383	-10.95	21.017	-17.06	17.306	-14.61	0.67090	1
3	4.55	20.13	6.39	18.22	2.56	17.12	6.17	18.12	6.00	18.09	23.41	15.54	17.14	3.25	16.29	1.27	12.32	21.56		
	12.645	-4.17	12.570	-2.18	10.124	11.88	12.302	-1.01	12.138	0.28	7.877	20.77	22.380	-10.97	21.016	-17.06	17.308	-14.62	0.80232	3
5	4.59	20.08	6.52	18.18	3.02	17.09	6.17	18.06	5.55	18.02	23.34	15.47	17.06	3.17	16.21	1.19	12.24	21.48		
	12.766	-4.94	12.782	-3.72	10.275	11.17	12.381	-1.54	12.165	0.11	7.885	20.75	22.376	-10.99	21.014	-17.07	17.311	-14.64	0.93374	5
7	5.03	20.04	7.05	18.15	3.07	17.06	6.16	18.00	5.50	17.55	23.27	15.39	16.58	3.08	16.13	1.11	12.17	21.41		
	12.888	-5.71	12.991	-5.24	10.425	10.44	12.460	-2.06	12.191	-0.05	7.894	20.73	22.372	-11.01	21.013	-17.07	17.314	-14.65	1.06516	7
9	5.07	19.59	7.18	18.11	3.12	17.03	6.16	17.54	5.44	17.47	23.19	15.32	16.50	3.00	16.05	1.03	12.09	21.33		
	13.010	-6.47	13.199	-6.74	10.576	9.69	12.540	-2.59	12.217	-0.22	7.901	20.71	22.369	-11.03	21.012	-17.08	17.316	-14.67	1.19658	9
11	5.10	19.54	7.30	18.08	3.18	16.60	6.16	17.48	5.39	17.40	23.12	15.24	16.42	2.52	15.57	0.55	12.02	21.25		
	13.133	-7.22	13.404	-8.20	10.726	8.91	12.619	-3.11	12.243	-0.39	7.909	20.69	22.366	-11.05	21.011	-17.08	17.319	-14.68	1.32800	11
13	5.14	19.50	7.42	18.04	3.23	16.56	6.16	17.42	5.33	17.33	23.05	15.17	16.34	2.44	15.49	0.47	11.54	21.17		
	13.256	-7.97	13.607	-9.63	10.875	8.12	12.699	-3.63	12.269	-0.56	7.915	20.68	22.363	-11.06	21.010	-17.09	17.322	-14.70	1.45941	13
15	5.18	19.45	7.55	18.01	3.29	16.53	6.15	17.37	5.28	17.26	22.57	15.09	16.26	2.36	15.41	0.39	11.46	21.09		
	13.380	-8.71	13.809	-11.02	11.025	7.30	12.779	-4.15	12.295	-0.72	7.922	20.66	22.360	-11.08	21.009	-17.09	17.325	-14.71	1.59083	15
17	5.21	19.41	8.06	17.57	3.35	16.50	6.15	17.31	5.23	17.19	22.50	15.02	16.19	2.28	15.34	0.31	11.39	21.02		
	13.505	-9.45	14.010	-12.36	11.174	6.47	12.859	-4.67	12.321	-0.89	7.928	20.65	22.357	-11.09	21.009	-17.09	17.328	-14.72	1.72225	17
19	5.25	19.37	8.18	17.54	3.40	16.46	6.15	17.25	5.17	17.12	22.43	14.54	16.11	2.20	15.26	0.23	11.31	20.54		
	13.630	-10.17	14.210	-13.66	11.324	5.62	12.939	-5.19	12.347	-1.05	7.933	20.64	22.355	-11.10	21.008	-17.10	17.332	-14.74	1.85367	19
21	5.28	19.32	8.30	17.50	3.46	16.42	6.14	17.19	5.12	17.04	22.35	14.46	16.03	2.12	15.18	0.15	11.24	20.46		
	13.756	-10.89	14.410	-14.90	11.473	4.76	13.020	-5.70	12.372	-1.21	7.938	20.62	22.353	-11.12	21.008	-17.10	17.335	-14.75	1.98509	21
23	5.32	19.28	8.41	17.47	3.52	16.39	6.14	17.13	5.06	16.57	22.27	14.39	15.55	2.04	15.10	0.08	11.16	20.38		
	13.882	-11.59	14.609	-16.10	11.622	3.89	13.101	-6.22	12.398	-1.37	7.942	20.62	22.350	-11.13	21.008	-17.10	17.339	-14.76	2.11651	23
25	5.35	19.24	8.52	17.44	3.57	16.35	6.14	17.07	5.01	16.50	22.20	14.31	15.47	1.55	15.02	23.56	11.09	20.31		
	14.010	-12.28	14.809	-17.23	11.771	3.00	13.182	-6.73	12.423	-1.53	7.946	20.61	22.349	-11.14	21.008	-17.10	17.342	-14.78	2.24793	25
27	5.38	19.21	9.03	17.41	4.03	16.31	6.14	17.02	4.55	16.43	22.12	14.23	15.39	1.47	14.54	23.48	11.01	20.23		
	14.138	-12.96	15.008	-18.31	11.920	2.11	13.263	-7.24	12.448	-1.69	7.950	20.60	22.347	-11.15	21.008	-17.10	17.346	-14.79	2.37935	27
29	5.42	19.17	9.14	17.39	4.09	16.28	6.13	16.56	4.50	16.35	22.05	14.16	15.31	1.39	14.46	23.40	10.53	20.15		
	14.267	-13.63	15.208	-19.33	12.069	1.20	13.345	-7.74	12.473	-1.85	7.952	20.60	22.345	-11.15	21.008	-17.10	17.350	-14.81	2.51076	29
31	5.45	19.14	9.24	17.36	4.15	16.24	6.13	16.50	4.44	16.28	21.57	14.08	15.23	1.31	14.39	23.32	10.46	20.08		
	14.396	-14.28	15.407	-20.29	12.219	0.29	13.427	-8.25	12.498	-2.00	7.955	20.59	22.344	-11.16	21.009	-17.10	17.354	-14.82	2.64219	31
31	4.45	18.14	8.25	16.36	3.15	15.24	5.13	15.50	3.44	15.28	20.57	13.08	14.23	0.31	13.39	22.32	9.46	19.08		
	14.399	-14.29	15.411	-20.31	12.222	0.27	13.429	-8.26	12.498	-2.01	7.955	20.59	22.344	-11.16	21.009	-17.10	17.354	-14.82	2.64219	31

LISTOPAD 2004

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2453																					
306	1	Pon	311	14.58321	16.27	14.2752	-14.37	0.99232	5.5116	27.48	63.348	4.3	83	644	1129.3	1614	1806	233.2	1150	1447	1
307	2	Wto	312	15.02286	16.28	14.3148	-14.56	0.99207	6.4457	27.56	63.490	5.3	75	646	1129.3	1612	1900	324.7	1243	1443	2
308	3	Śro	313	15.06252	16.28	14.3544	-15.15	0.99182	7.3756	26.48	63.451	6.3	67	648	1129.3	1610	2006	415.9	1322	1439	3
309	4	Czw	314	15.10217	16.27	14.3942	-15.33	0.99157	8.2929	24.27	63.217	7.3	58	650	1129.3	1608	2119	505.6	1349	1435	4
310	5	Pią	315	15.14183	16.25	14.4340	-15.51	0.99133	9.1914	21.01	62.786	0.2	48	652	1129.3	1606	2235	553.5	1409	1431	5
311	6	Sob	316	15.18149	16.23	14.4739	-16.09	0.99109	10.0716	16.39	62.171	1.2	38	653	1129.4	1605	2353	639.4	1423	1427	6
312	7	Nie	317	15.22114	16.19	14.5139	-16.27	0.99085	10.5404	11.30	61.405	2.2	29	655	1129.4	1603	****	723.7	1435	1423	7
313	8	Pon	318	15.26079	16.15	14.5539	-16.44	0.99062	11.4024	5.44	60.535	3.2	20	657	1129.5	1601	111	807.4	1445	1419	8
314	9	Wto	319	15.30045	16.10	14.5941	-17.01	0.99038	12.2715	-0.27	59.622	4.2	12	659	1129.6	1559	230	851.5	1455	1415	9
315	10	Śro	320	15.34011	16.04	15.0344	-17.18	0.99015	13.1544	-6.49	58.740	5.2	6	701	1129.7	1558	352	937.2	1506	1411	10
316	11	Czw	321	15.37576	15.57	15.0747	-17.35	0.98992	14.0701	-13.03	57.960	6.2	2	703	1129.8	1556	519	1025.9	1518	1408	11
317	12	Pią	322	15.41542	15.50	15.1151	-17.51	0.98969	15.0213	-18.44	57.350	7.2	0	705	1129.9	1554	650	1118.8	1534	1404	12
318	13	Sob	323	15.45507	15.41	15.1556	-18.07	0.98947	16.0156	-23.26	56.958	0.9	1	707	1130.1	1553	825	1216.8	1558	1400	13
319	14	Nie	324	15.49473	15.32	15.2002	-18.23	0.98924	17.0553	-26.38	56.807	1.9	5	708	1130.2	1551	959	1319.5	1635	1356	14
320	15	Pon	325	15.53439	15.22	15.2409	-18.38	0.98902	18.1222	-27.59	56.894	2.9	11	710	1130.4	1550	1119	1425.0	1731	1352	15
321	16	Wto	326	15.57404	15.11	15.2816	-18.53	0.98880	19.1842	-27.20	57.188	3.9	20	712	1130.6	1548	1217	1530.0	1848	1348	16
322	17	Śro	327	16.01370	14.59	15.3225	-19.07	0.98858	20.2213	-24.49	57.645	4.9	30	714	1130.8	1547	1255	1631.4	2017	1344	17
323	18	Czw	328	16.05335	14.46	15.3634	-19.22	0.98836	21.2122	-20.48	58.210	5.9	41	716	1131.0	1546	1320	1727.7	2148	1340	18
324	19	Pią	329	16.09301	14.33	15.4044	-19.36	0.98815	22.1553	-15.43	58.836	0.2	52	717	1131.2	1544	1336	1819.0	2316	1336	19
325	20	Sob	330	16.13267	14.19	15.4455	-19.49	0.98794	23.0630	-9.58	59.479	1.2	63	719	1131.4	1543	1349	1906.3	****	1332	20
326	21	Nie	331	16.17232	14.04	15.4906	-20.02	0.98773	23.5418	-3.53	60.112	2.2	73	721	1131.7	1542	1359	1950.9	039	1328	21
327	22	Pon	332	16.21198	13.48	15.5319	-20.15	0.98753	0.4033	2.15	60.716	3.2	82	723	1132.0	1541	1409	2034.2	159	1324	22
328	23	Wto	333	16.25163	13.31	15.5732	-20.28	0.98734	1.2621	8.11	61.283	4.2	89	724	1132.2	1540	1419	2117.4	318	1320	23
329	24	Śro	334	16.29129	13.14	16.0146	-20.40	0.98714	2.1245	13.42	61.808	5.2	95	726	1132.5	1539	1430	2201.7	436	1316	24
330	25	Czw	335	16.33094	12.56	16.0600	-20.52	0.98696	3.0033	18.35	62.289	6.2	98	728	1132.8	1537	1443	2247.7	554	1312	25
331	26	Pią	336	16.37060	12.37	16.1016	-21.03	0.98677	3.5013	22.38	62.719	7.2	100	729	1133.1	1536	1502	2335.9	712	1309	26
332	27	Sob	337	16.41025	12.17	16.1432	-21.14	0.98660	4.4149	25.38	63.089	0.6	100	731	1133.5	1536	1527	*****	829	1305	27
333	28	Nie	338	16.44591	11.57	16.1849	-21.24	0.98643	5.3457	27.26	63.382	1.6	98	733	1133.8	1535	1603	026.2	938	1301	28
334	29	Pon	339	16.48557	11.36	16.2306	-21.34	0.98626	6.2842	27.57	63.576	2.6	94	734	1134.1	1534	1651	117.6	1036	1257	29
335	30	Wto	340	16.52522	11.14	16.2725	-21.44	0.98610	7.2200	27.11	63.648	3.6	89	736	1134.5	1533	1753	209.0	1120	1253	30

Fazy Księżyca [Dm, h.mm]: 3kw 5, 6.53 Nów 12, 15.27 1kw 19, 6.50 Pełn 26, 21.07

LISTOPAD 2004 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.47	18.12	8.30	16.35	3.18	15.22	5.13	15.47	3.41	15.25	20.53	13.04	14.19	0.28	13.35	22.28	9.42	19.04		
	14.464	-14.61	15.511	-20.76	12.297	-0.19	13.470	-8.51	12.510	-2.09	7.956	20.59	22.343	-11.16	21.009	-17.09	17.356	-14.83	2.70790	1
3	4.50	18.09	8.40	16.33	3.24	15.18	5.13	15.42	3.36	15.17	20.45	12.56	14.11	0.20	13.27	22.21	9.35	18.56		
	14.596	-15.24	15.710	-21.62	12.446	-1.11	13.552	-9.01	12.535	-2.24	7.957	20.59	22.342	-11.17	21.010	-17.09	17.360	-14.84	2.83932	3
5	4.53	18.06	8.50	16.32	3.30	15.14	5.13	15.36	3.30	15.10	20.38	12.48	14.03	0.12	13.19	22.13	9.27	18.48		
	14.728	-15.85	15.909	-22.40	12.596	-2.03	13.635	-9.50	12.559	-2.39	7.958	20.59	22.342	-11.17	21.010	-17.09	17.364	-14.85	2.97074	5
7	4.56	18.03	8.59	16.30	3.36	15.11	5.13	15.31	3.24	15.03	20.30	12.40	13.55	0.04	13.11	22.05	9.20	18.41		
	14.861	-16.45	16.107	-23.11	12.747	-2.95	13.719	-9.99	12.583	-2.54	7.959	20.59	22.341	-11.17	21.011	-17.08	17.369	-14.86	3.10216	7
9	4.60	17.60	9.07	16.30	3.43	15.07	5.13	15.25	3.19	14.56	20.22	12.33	13.48	23.52	13.03	21.57	9.12	18.33		
	14.995	-17.02	16.303	-23.74	12.898	-3.87	13.802	-10.48	12.607	-2.69	7.959	20.59	22.341	-11.17	21.013	-17.08	17.373	-14.88	3.23358	9
11	5.03	17.57	9.15	16.29	3.49	15.03	5.13	15.19	3.13	14.49	20.14	12.25	13.40	23.44	12.55	21.49	9.04	18.25		
	15.130	-17.58	16.497	-24.29	13.050	-4.80	13.886	-10.96	12.630	-2.83	7.958	20.60	22.340	-11.17	21.014	-17.07	17.378	-14.89	3.36499	11
13	5.06	17.55	9.23	16.29	3.55	14.59	5.13	15.14	3.07	14.41	20.06	12.17	13.32	23.36	12.48	21.42	8.57	18.18		
	15.266	-18.12	16.688	-24.75	13.202	-5.71	13.971	-11.44	12.653	-2.98	7.957	20.60	22.340	-11.17	21.015	-17.07	17.382	-14.90	3.49642	13
15	5.09	17.52	9.29	16.29	4.01	14.56	5.12	15.08	3.02	14.34	19.58	12.09	13.24	23.28	12.40	21.34	8.49	18.10		
	15.402	-18.63	16.873	-25.13	13.354	-6.63	14.055	-11.91	12.676	-3.12	7.956	20.61	22.341	-11.17	21.017	-17.06	17.387	-14.91	3.62784	15
17	5.12	17.50	9.34	16.30	4.07	14.52	5.12	15.03	2.56	14.27	19.50	12.01	13.16	23.21	12.32	21.26	8.42	18.02		
	15.540	-19.12	17.051	-25.41	13.508	-7.53	14.141	-12.38	12.699	-3.26	7.954	20.62	22.341	-11.16	21.019	-17.06	17.392	-14.92	3.75926	17
19	5.15	17.48	9.38	16.30	4.14	14.49	5.12	14.57	2.50	14.20	19.42	11.53	13.08	23.13	12.24	21.19	8.34	17.55		
	15.679	-19.59	17.219	-25.59	13.662	-8.43	14.226	-12.84	12.721	-3.39	7.951	20.63	22.342	-11.16	21.021	-17.05	17.396	-14.93	3.89068	19
21	5.18	17.46	9.40	16.31	4.20	14.45	5.12	14.52	2.44	14.12	19.34	11.45	13.00	23.05	12.16	21.11	8.27	17.47		
	15.818	-20.04	17.373	-25.68	13.817	-9.31	14.312	-13.29	12.743	-3.53	7.948	20.64	22.343	-11.15	21.023	-17.04	17.401	-14.95	4.02210	21
23	5.20	17.44	9.40	16.31	4.26	14.42	5.12	14.47	2.38	14.05	19.25	11.37	12.53	22.57	12.09	21.03	8.19	17.39		
	15.959	-20.46	17.510	-25.67	13.974	-10.19	14.399	-13.74	12.765	-3.66	7.944	20.66	22.344	-11.14	21.025	-17.03	17.406	-14.96	4.15352	23
25	5.23	17.43	9.38	16.31	4.33	14.38	5.12	14.41	2.32	13.58	19.17	11.29	12.45	22.49	12.01	20.56	8.12	17.32		
	16.100	-20.86	17.623	-25.55	14.131	-11.05	14.486	-14.19	12.786	-3.79	7.940	20.67	22.345	-11.13	21.027	-17.02	17.411	-14.97	4.28494	25
27	5.26	17.42	9.33	16.30	4.39	14.35	5.12	14.36	2.27	13.50	19.09	11.21	12.37	22.42	11.53	20.48	8.04	17.24		
	16.242	-21.23	17.707	-25.33	14.289	-11.89	14.573	-14.62	12.807	-3.91	7.935	20.69	22.347	-11.12	21.030	-17.01	17.416	-14.98	4.41636	27
29	5.28	17.41	9.26	16.28	4.46	14.32	5.12	14.31	2.21	13.43	19.01	11.13	12.29	22.34	11.45	20.40	7.57	17.17		
	16.385	-21.57	17.753	-25.00	14.448	-12.72	14.661	-15.05	12.828	-4.04	7.930	20.71	22.349	-11.11	21.032	-17.00	17.421	-14.99	4.54779	29

GRUDZIEŃ 2004

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]									
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2453																			
336	1	Śro	341	16.56488	10.52	16.3143	-21.53	0.98594	8.1353	25.10	63.574	4.6	82	737	1134.9	1532	1903	259.3	1151	1249	1	
337	2	Czw	342	17.00453	10.29	16.3603	-22.02	0.98579	9.0347	22.04	63.333	5.6	74	739	1135.3	1532	2018	347.6	1213	1245	2	
338	3	Pią	343	17.04419	10.06	16.4023	-22.11	0.98565	9.5139	18.02	62.915	6.6	65	740	1135.7	1531	2134	433.6	1229	1241	3	
339	4	Sob	344	17.08385	9.41	16.4444	-22.19	0.98551	10.3752	13.13	62.317	7.6	56	741	1136.1	1531	2250	517.6	1242	1237	4	
340	5	Nie	345	17.12350	9.17	16.4905	-22.26	0.98537	11.2310	7.47	61.556	0.4	46	743	1136.5	1530	****	600.3	1252	1233	5	
341	6	Pon	346	17.16316	8.51	16.5327	-22.34	0.98524	12.0829	1.54	60.663	1.4	36	744	1136.9	1530	006	642.8	1302	1229	6	
342	7	Wto	347	17.20281	8.25	16.5750	-22.40	0.98511	12.5457	-4.15	59.688	2.4	26	745	1137.3	1529	124	726.3	1311	1225	7	
343	8	Śro	348	17.24247	7.59	17.0212	-22.47	0.98499	13.4352	-10.25	58.697	3.4	17	746	1137.8	1529	246	812.2	1322	1221	8	
344	9	Czw	349	17.28212	7.32	17.0636	-22.52	0.98487	14.3631	-16.18	57.771	4.4	9	748	1138.2	1529	413	901.9	1336	1217	9	
345	10	Pią	350	17.32178	7.05	17.1060	-22.58	0.98475	15.3401	-21.28	56.992	5.4	4	749	1138.7	1528	546	957.0	1356	1213	10	
346	11	Sob	351	17.36143	6.37	17.1524	-23.03	0.98464	16.3643	-25.24	56.436	6.4	1	750	1139.1	1528	722	1057.9	1426	1210	11	
347	12	Nie	352	17.40109	6.09	17.1949	-23.07	0.98453	17.4341	-27.36	56.155	0.4	0	751	1139.6	1528	852	1203.7	1513	1206	12	
348	13	Pon	353	17.44075	5.41	17.2414	-23.11	0.98442	18.5223	-27.44	56.174	1.4	3	752	1140.1	1528	1003	1311.5	1622	1202	13	
349	14	Wto	354	17.48040	5.12	17.2839	-23.15	0.98432	19.5929	-25.48	56.478	2.4	9	753	1140.5	1528	1052	1417.3	1751	1158	14	
350	15	Śro	355	17.52006	4.43	17.3304	-23.18	0.98422	21.0227	-22.06	57.025	3.4	16	754	1141.0	1528	1122	1518.2	1926	1154	15	
351	16	Czw	356	17.55572	4.14	17.3730	-23.20	0.98412	22.0015	-17.07	57.750	4.4	26	754	1141.5	1528	1142	1613.3	2058	1150	16	
352	17	Pią	357	17.59537	3.44	17.4156	-23.23	0.98403	22.5316	-11.21	58.578	5.4	37	755	1142.0	1529	1156	1703.2	2226	1146	17	
353	18	Sob	358	18.03503	3.15	17.4622	-23.24	0.98394	23.4237	-5.12	59.442	6.4	47	756	1142.5	1529	1208	1749.4	2348	1142	18	
354	19	Nie	359	18.07468	2.45	17.5048	-23.25	0.98385	0.2936	0.60	60.282	0.8	58	757	1143.0	1529	1217	1833.4	****	1138	19	
355	20	Pon	360	18.11434	2.15	17.5515	-23.26	0.98378	1.1532	6.59	61.058	1.8	68	757	1143.5	1530	1227	1916.5	107	1134	20	
356	21	Wto	361	18.15400	1.46	17.5941	-23.26	0.98370	2.0134	12.35	61.743	2.8	77	758	1144.0	1530	1238	2000.1	225	1130	21	
357	22	Śro	362	18.19365	1.16	18.0407	-23.26	0.98364	2.4838	17.34	62.326	3.8	85	758	1144.5	1531	1250	2045.2	343	1126	22	
358	23	Czw	363	18.23330	0.46	18.0834	-23.26	0.98357	3.3724	21.46	62.804	4.8	91	759	1145.0	1531	1307	2132.2	500	1122	23	
359	24	Pią	364	18.27296	0.16	18.1300	-23.24	0.98352	4.2810	24.59	63.180	5.8	96	759	1145.5	1532	1330	2221.5	616	1118	24	
360	25	Sob	365	18.31262	-0.13	18.1726	-23.23	0.98347	5.2040	27.04	63.457	6.8	99	759	1146.0	1533	1402	2312.3	728	1115	25	
361	26	Nie	366	18.35227	-0.43	18.2152	-23.21	0.98342	6.1413	27.54	63.640	7.8	100	800	1146.5	1533	1446	*****	830	1111	26	
362	27	Pon	367	18.39193	-1.12	18.2618	-23.18	0.98339	7.0743	27.25	63.725	0.8	99	800	1147.0	1534	1544	003.9	918	1107	27	
363	28	Wto	368	18.43159	-1.42	18.3044	-23.15	0.98336	8.0005	25.42	63.709	1.8	97	800	1147.4	1535	1652	054.7	953	1103	28	
364	29	Śro	369	18.47124	-2.11	18.3510	-23.12	0.98333	8.5031	22.50	63.579	2.8	93	800	1147.9	1536	1806	143.7	1018	1059	29	
365	30	Czw	370	18.51090	-2.40	18.3935	-23.08	0.98332	9.3844	19.01	63.323	3.8	87	800	1148.4	1537	1921	230.4	1035	1055	30	
366	31	Pią	371	18.55055	-3.08	18.4400	-23.03	0.98331	10.2458	14.24	62.929	4.8	80	800	1148.9	1538	2036	314.7	1049	1051	31	

Fazy Księżyca [Dm, h.mm]: 3kw 5, 1.53 Nów 12, 2.29 1kw 18, 17.40 Pełn 26, 16.06

GRUDZIEŃ 2004 (c.d.)

Świty, zmierny astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	5.31	17.40	9.14	16.23	4.52	14.29	5.12	14.26	2.15	13.36	18.52	11.05	12.21	22.26	11.38	20.33	7.49	17.09		
	16.529	-21.89	17.755	-24.56	14.609	-13.53	14.749	-15.48	12.848	-4.16	7.925	20.72	22.351	-11.10	21.035	-16.99	17.426	-15.00	4.67921	1
3	5.33	17.39	8.59	16.17	4.59	14.26	5.12	14.21	2.09	13.29	18.44	10.57	12.13	22.19	11.30	20.25	7.42	17.01		
	16.673	-22.18	17.706	-24.01	14.770	-14.32	14.838	-15.89	12.867	-4.28	7.919	20.74	22.353	-11.09	21.038	-16.98	17.431	-15.00	4.81063	3
5	5.35	17.38	8.40	16.08	5.05	14.24	5.12	14.16	2.02	13.21	18.36	10.49	12.06	22.11	11.22	20.17	7.34	16.54		
	16.818	-22.44	17.604	-23.34	14.933	-15.08	14.927	-16.30	12.887	-4.39	7.912	20.76	22.355	-11.07	21.041	-16.96	17.436	-15.01	4.94205	5
7	5.37	17.38	8.17	15.57	5.11	14.21	5.12	14.11	1.56	13.14	18.27	10.41	11.58	22.04	11.14	20.10	7.27	16.46		
	16.964	-22.67	17.453	-22.56	15.097	-15.82	15.017	-16.70	12.906	-4.50	7.905	20.79	22.358	-11.05	21.044	-16.95	17.441	-15.02	5.07347	7
9	5.39	17.38	7.52	15.44	5.18	14.19	5.12	14.06	1.50	13.07	18.19	10.33	11.50	21.56	11.07	20.02	7.19	16.39		
	17.110	-22.87	17.270	-21.73	15.263	-16.53	15.108	-17.09	12.924	-4.61	7.898	20.81	22.361	-11.04	21.047	-16.94	17.446	-15.03	5.20489	9
11	5.41	17.38	7.27	15.31	5.24	14.16	5.12	14.01	1.44	12.59	18.10	10.24	11.42	21.48	10.59	19.55	7.12	16.31		
	17.257	-23.04	17.078	-20.90	15.430	-17.22	15.198	-17.48	12.942	-4.72	7.890	20.84	22.364	-11.02	21.050	-16.92	17.451	-15.04	5.33631	11
13	5.43	17.38	7.04	15.17	5.31	14.15	5.12	13.56	1.38	12.52	18.02	10.16	11.34	21.41	10.51	19.47	7.04	16.23		
	17.404	-23.19	16.901	-20.16	15.598	-17.88	15.290	-17.85	12.960	-4.82	7.882	20.86	22.367	-11.00	21.054	-16.91	17.456	-15.05	5.46774	13
15	5.44	17.38	6.44	15.05	5.37	14.13	5.12	13.52	1.31	12.44	17.53	10.08	11.27	21.33	10.43	19.40	6.57	16.16		
	17.551	-23.30	16.760	-19.59	15.767	-18.50	15.382	-18.22	12.977	-4.92	7.873	20.89	22.370	-10.98	21.058	-16.89	17.462	-15.05	5.59916	15
17	5.46	17.39	6.28	14.54	5.43	14.11	5.12	13.47	1.25	12.37	17.44	9.60	11.19	21.26	10.36	19.32	6.49	16.08		
	17.699	-23.38	16.666	-19.25	15.938	-19.09	15.474	-18.57	12.993	-5.01	7.865	20.91	22.374	-10.96	21.061	-16.88	17.467	-15.06	5.73058	17
19	5.47	17.40	6.17	14.44	5.49	14.10	5.12	13.42	1.19	12.30	17.36	9.52	11.11	21.18	10.28	19.24	6.42	16.01		
	17.847	-23.42	16.623	-19.12	16.110	-19.65	15.567	-18.92	13.009	-5.11	7.855	20.94	22.378	-10.93	21.065	-16.86	17.472	-15.07	5.86200	19
21	5.48	17.41	6.09	14.36	5.55	14.09	5.12	13.38	1.12	12.22	17.27	9.43	11.03	21.11	10.20	19.17	6.34	15.53		
	17.995	-23.44	16.626	-19.20	16.283	-20.17	15.660	-19.26	13.024	-5.19	7.846	20.97	22.382	-10.91	21.069	-16.85	17.477	-15.07	5.99342	21
23	5.49	17.42	6.06	14.29	6.01	14.08	5.12	13.33	1.06	12.15	17.19	9.35	10.56	21.03	10.12	19.09	6.27	15.45		
	18.143	-23.43	16.670	-19.44	16.458	-20.65	15.754	-19.58	13.039	-5.28	7.836	21.00	22.386	-10.88	21.073	-16.83	17.482	-15.08	6.12484	23
25	5.50	17.43	6.05	14.24	6.07	14.08	5.12	13.29	0.99	12.07	17.10	9.27	10.48	20.56	10.05	19.02	6.19	15.38		
	18.291	-23.38	16.748	-19.79	16.633	-21.10	15.849	-19.90	13.053	-5.36	7.826	21.03	22.390	-10.86	21.077	-16.81	17.487	-15.08	6.25626	25
27	5.51	17.44	6.06	14.19	6.13	14.08	5.12	13.25	0.92	11.60	17.01	9.19	10.40	20.48	9.57	18.54	6.12	15.30		
	18.438	-23.30	16.854	-20.21	16.810	-21.50	15.944	-20.21	13.067	-5.43	7.815	21.06	22.395	-10.83	21.081	-16.79	17.492	-15.09	6.38769	27
29	5.51	17.46	6.09	14.16	6.18	14.08	5.12	13.21	0.86	11.52	16.52	9.10	10.32	20.41	9.49	18.47	6.04	15.23		
	18.586	-23.19	16.982	-20.68	16.988	-21.86	16.039	-20.50	13.080	-5.51	7.805	21.09	22.400	-10.80	21.085	-16.78	17.497	-15.09	6.51911	29
31	5.51	17.48	6.13	14.13	6.23	14.08	5.11	13.16	0.89	11.45	16.44	9.02	10.25	20.34	9.41	18.39	5.57	15.15		
	18.733	-23.06	17.128	-21.16	17.166	-22.18	16.135	-20.78	13.093	-5.58	7.794	21.12	22.404	-10.77	21.090	-16.76	17.502	-15.10	6.65053	31

Święta państwowe i kościelne w Polsce oraz inne ważniejsze dni w roku 2004

Nowy Rok	Czw	1 styczeń	Zesłania Ducha Świętego	Nie	30 maj
Najświętszej Maryi Panny Rodzicielki	Czw	1 styczeń	Dzień Dziecka	Wto	1 czerwiec
Objawienia Pańskiego (Trzech Króli)	Wto	6 styczeń	Trójcy Najświętszej	Nie	6 czerwiec
Juliański Nowy Rok	Śro	14 styczeń	Dzień Dziękczynienia	Nie	6 czerwiec
Dzień Babci	Śro	21 styczeń	Boże Ciało	Czw	10 czerwiec
Dzień Dziadka	Czw	22 styczeń	Najświętszego Serca Pana Jezusa	Pią	18 czerwiec
Ofiarowania Pańskiego	Pon	2 luty	Dzień Ojca	Śro	23 czerwiec
Matki Boskiej Gromnicznej	Pon	2 luty	Noc Świętojańska	Śro	23 czerwiec
Walentynki	Sob	14 luty	Św. Piotra i Pawła	Wto	29 czerwiec
Tłusty czwartek	Czw	19 luty	Wniebowzięcia N.M.P.	Nie	15 sierpień
Święto UMK	Czw	19 luty	Święto Wojska Polskiego	Nie	15 sierpień
Środa Popielcowa	Śro	25 luty	Dzień Solidarności i Wolności	Wto	31 sierpień
Dzień Kobiet	Pon	8 marzec	Dzień Programisty	Pon	13 wrzesień
Narodowy Dzień Życia	Śro	24 marzec	Dożynki – Święto Plonów	Czw	23 wrzesień
Niedziela Palmowa	Nie	4 kwiecień	Dzień Papieski	Nie	10 październik
Niedziela Wielkanocna	Nie	11 kwiecień	Dzień Edukacji Narodowej	Czw	14 październik
Niedziela Miłosierdzia Bożego	Nie	18 kwiecień	Dzień Papieża Jana Pawła II	Sob	16 październik
Święto Pracy	Sob	1 maj	Wszystkich Świętych	Pon	1 listopad
Dzień Flagi Rzeczypospolitej Polskiej	Nie	2 maj	Zaduszki	Wto	2 listopad
Najświętsza Maryja Królowa Polski	Pon	3 maj	Święto Niepodległości	Czw	11 listopad
Święto Konstytucji 3 Maja	Pon	3 maj	Pierwsza niedziela Adwentu	Nie	28 listopad
Dzień Polskiej Niezapominajki	Sob	15 maj	Niepokalane Poczęcie N.M.P.	Śro	8 grudzień
Wniebowstąpienia Pańskiego	Czw	20 maj	Boże Narodzenie	Sob	25 grudzień
Dzień Matki	Śro	26 maj	Sylwester	Pią	31 grudzień

Kalendarz astronomiczny 2005

PIWNICE, CA UMK

Współrzędne geograficzne: 18.5641°E 53.0955°N, Nr strefy czasowej (> 0 , gdy na wschód) = 1 (CSE)

Kalendarz jest gregoriańskim i jest oparty na efemerydach Układu Słonecznego obliczanych z dokładnością 1' (Słońce 2", Księżyc 10", Pluton 15'). Czas gwiazdowy ma dokładność około 0.1 s. Wschody i zachody obliczono z uwzględnieniem horyzontalnej refrakcji astronomicznej (34'), rozciągłości Słońca lub Księżyca i paralaksy horyzontalnej Księżyca. Dla dat odległych o więcej niż ok. 300 lat od roku 1950 dokładności położenia planet są gorsze niż 1'!
(Kalendarz ten opracowano [KMB] w Katedrze Radioastronomii CA UMK, Toruń—Piwnice. Oblicz. dnia 7.10.2010 r.)

Data Wielkanocy: **2005 MARZEC 27**

Dla całego roku przyjęto: TDT – UT = 65 s

Pory roku [miesiąc dzień, godz. mm] (czas zimowy): Wiosna **III 20, 13.33**, Lato **VI 21, 7.46**, Jesień **IX 22, 23.23**, Zima **XII 21, 19.35**

Dane w czasie letnim odróżniono kolorem brązowym; czas ten obowiązuje **od 27 marca do 30 października 2005 r.**

Oznaczenia:

Dr — dzień 2005 roku (1 stycznia Dr = 1)

Dm — dzień miesiąca

Dt — dzień tygodnia

JD — data juliańska modulo 1000 o 12^h UT
(po nagłówku: Entier(JD/1000) dla Dm = 1)

ST — prawdziwy czas gwiazdowy

$\Delta\alpha$ — różnica czasu (czas słoneczny prawdziwy minus średni)

α — rektascensja (Słońca lub Księżyca)

δ — deklinacja (Słońca lub Księżyca)

R — odległość (Słońca lub Księżyca)

j astr — jednostka astronomiczna

ρ_{\oplus} — promień Ziemi

Faza \leftarrow dni po kwadrze i % oświetlonej części tarczy Księżyca

Wsch — wschód (Słońca, Księżyca lub planety)

Gór — górowanie czyli tranzyt (Gal. = centrum Galaktyki)

Zach — zachód (Słońca, Księżyca lub planety)

STYCZEŃ 2005

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]									
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°/′	j astr	h.mmss	°/′	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2453																			
1	1	Sob	372	18.59021	-3.37	18.4825	-22.58	0.98330	11.0946	9.11	62.389	5.8	72	800	1149.4	1539	2151	357.2	1059	1047	1	
2	2	Nie	373	19.02587	-4.05	18.5250	-22.53	0.98330	11.5401	3.32	61.706	6.8	63	800	1149.8	1540	2306	438.7	1109	1043	2	
3	3	Pon	374	19.06552	-4.32	18.5714	-22.47	0.98330	12.3844	-2.23	60.892	7.8	53	759	1150.3	1542	****	520.4	1118	1039	3	
4	4	Wto	375	19.10518	-4.60	19.0138	-22.41	0.98331	13.2510	-8.22	59.978	0.7	43	759	1150.7	1543	024	603.6	1128	1035	4	
5	5	Śro	376	19.14483	-5.27	19.0601	-22.34	0.98333	14.1435	-14.12	59.011	1.7	32	759	1151.2	1544	145	649.7	1140	1031	5	
6	6	Czw	377	19.18449	-5.53	19.1025	-22.27	0.98335	15.0817	-19.31	58.055	2.7	22	758	1151.6	1545	312	740.2	1156	1027	6	
7	7	Pią	378	19.22414	-6.19	19.1447	-22.20	0.98337	16.0715	-23.54	57.190	3.7	13	758	1152.1	1547	444	836.5	1219	1023	7	
8	8	Sob	379	19.26380	-6.45	19.1909	-22.12	0.98340	17.1130	-26.52	56.498	4.7	6	757	1152.5	1548	617	938.8	1255	1020	8	
9	9	Nie	380	19.30346	-7.10	19.2331	-22.03	0.98343	18.1931	-27.56	56.052	5.7	2	757	1152.9	1550	738	1045.6	1353	1016	9	
10	10	Pon	381	19.34311	-7.34	19.2752	-21.54	0.98347	19.2821	-26.53	55.905	6.7	0	756	1153.3	1551	839	1153.6	1513	1012	10	
11	11	Wto	382	19.38277	-7.58	19.3212	-21.45	0.98351	20.3443	-23.49	56.075	1.0	1	755	1153.7	1553	919	1258.8	1649	1008	11	
12	12	Śro	383	19.42243	-8.21	19.3632	-21.35	0.98355	21.3631	-19.09	56.543	2.0	6	755	1154.1	1554	944	1358.7	1827	1004	12	
13	13	Czw	384	19.46208	-8.44	19.4051	-21.25	0.98359	22.3315	-13.24	57.256	3.0	13	754	1154.5	1556	1001	1453.0	2000	1000	13	
14	14	Pią	385	19.50174	-9.06	19.4510	-21.15	0.98364	23.2538	-7.06	58.139	4.0	21	753	1154.8	1557	1014	1542.5	2128	956	14	
15	15	Sob	386	19.54139	-9.27	19.4928	-21.04	0.98370	0.1452	-0.40	59.109	5.0	31	752	1155.2	1559	1025	1628.9	2251	952	15	
16	16	Nie	387	19.58105	-9.48	19.5345	-20.52	0.98376	1.0217	5.35	60.087	6.0	41	751	1155.5	1601	1034	1713.5	****	948	16	
17	17	Pon	388	20.02070	-10.08	19.5802	-20.40	0.98382	1.4908	11.25	61.007	0.2	52	750	1155.9	1602	1045	1757.7	012	944	17	
18	18	Wto	389	20.06036	-10.27	20.0217	-20.28	0.98389	2.3628	16.37	61.820	1.2	62	749	1156.2	1604	1057	1842.8	131	940	18	
19	19	Śro	390	20.10001	-10.46	20.0632	-20.16	0.98396	3.2504	21.01	62.495	2.2	71	748	1156.5	1606	1112	1929.4	249	936	19	
20	20	Czw	391	20.13567	-11.03	20.1047	-20.03	0.98404	4.1523	24.28	63.020	3.2	79	747	1156.8	1607	1133	2017.9	406	932	20	
21	21	Pią	392	20.17533	-11.20	20.1500	-19.49	0.98412	5.0725	26.48	63.393	4.2	86	745	1157.1	1609	1201	2108.2	519	928	21	
22	22	Sob	393	20.21498	-11.36	20.1913	-19.36	0.98421	6.0038	27.54	63.621	5.2	92	744	1157.4	1611	1242	2159.5	624	924	22	
23	23	Nie	394	20.25464	-11.52	20.2325	-19.22	0.98431	6.5407	27.42	63.719	6.2	97	743	1157.6	1613	1336	2250.5	717	921	23	
24	24	Pon	395	20.29429	-12.06	20.2736	-19.07	0.98441	7.4650	26.14	63.700	7.2	99	742	1157.9	1615	1441	2340.3	755	917	24	
25	25	Wto	396	20.33395	-12.20	20.3146	-18.53	0.98452	8.3752	23.36	63.579	0.0	100	740	1158.1	1617	1554	****	822	913	25	
26	26	Śro	397	20.37361	-12.33	20.3556	-18.38	0.98463	9.2648	19.56	63.363	1.0	99	739	1158.3	1618	1710	027.9	842	909	26	
27	27	Czw	398	20.41326	-12.45	20.4005	-18.22	0.98475	10.1337	15.26	63.057	2.0	96	737	1158.5	1620	1826	113.1	856	905	27	
28	28	Pią	399	20.45292	-12.57	20.4413	-18.06	0.98488	10.5845	10.18	62.659	3.0	92	736	1158.7	1622	1941	156.2	907	901	28	
29	29	Sob	400	20.49257	-13.07	20.4820	-17.50	0.98501	11.4254	4.43	62.168	4.0	86	734	1158.9	1624	2055	237.9	917	857	29	
30	30	Nie	401	20.53223	-13.17	20.5226	-17.34	0.98514	12.2701	-1.08	61.582	5.0	78	733	1159.0	1626	2211	319.1	926	853	30	
31	31	Pon	402	20.57188	-13.26	20.5632	-17.17	0.98529	13.1208	-7.02	60.903	6.0	69	731	1159.2	1628	2329	401.0	935	849	31	

Fazy Księżyca [Dm, h.mm]: 3kw 3, 18.46 Now 10, 13.03 1kw 17, 7.57 Pełn 25, 11.32

STYCZEŃ 2005 (c.d.)

Świty, zmiernicy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	5.51	17.49	6.16	14.12	6.25	14.09	5.11	13.14	0.35	11.41	16.39	8.58	10.21	20.30	9.38	18.36	5.53	15.11		
	18.807	-22.97	17.206	-21.40	17.256	-22.32	16.183	-20.92	13.099	-5.61	7.788	21.14	22.407	-10.76	21.092	-16.75	17.505	-15.10	6.71624	1
3	5.51	17.51	6.21	14.11	6.30	14.10	5.11	13.11	0.29	11.34	16.31	8.50	10.13	20.22	9.30	18.28	5.45	15.04		
	18.954	-22.79	17.373	-21.86	17.435	-22.57	16.280	-21.19	13.110	-5.67	7.777	21.17	22.412	-10.73	21.096	-16.73	17.510	-15.10	6.84766	3
5	5.51	17.53	6.27	14.11	6.35	14.11	5.11	13.07	0.22	11.26	16.22	8.41	10.05	20.15	9.22	18.21	5.38	14.56		
	19.100	-22.57	17.550	-22.29	17.616	-22.78	16.377	-21.44	13.121	-5.73	7.766	21.20	22.417	-10.70	21.101	-16.71	17.514	-15.11	6.97908	5
7	5.51	17.55	6.33	14.11	6.39	14.13	5.11	13.03	0.15	11.19	16.13	8.33	9.58	20.08	9.14	18.13	5.30	14.48		
	19.246	-22.33	17.736	-22.67	17.797	-22.94	16.474	-21.68	13.131	-5.78	7.755	21.24	22.423	-10.67	21.106	-16.69	17.519	-15.11	7.11050	7
9	5.50	17.57	6.39	14.13	6.43	14.15	5.10	12.59	0.08	11.11	16.04	8.25	9.50	20.00	9.07	18.06	5.23	14.41		
	19.392	-22.05	17.930	-22.99	17.978	-23.06	16.573	-21.91	13.140	-5.83	7.743	21.27	22.428	-10.63	21.110	-16.67	17.524	-15.11	7.24193	9
11	5.49	17.60	6.45	14.15	6.46	14.18	5.10	12.56	23.57	11.03	15.55	8.16	9.42	19.53	8.59	17.58	5.15	14.33		
	19.537	-21.75	18.129	-23.26	18.160	-23.13	16.671	-22.13	13.149	-5.88	7.732	21.30	22.434	-10.60	21.115	-16.65	17.529	-15.12	7.37335	11
13	5.48	18.02	6.51	14.18	6.49	14.20	5.09	12.52	23.50	10.56	15.47	8.08	9.34	19.46	8.51	17.51	5.07	14.26		
	19.681	-21.42	18.334	-23.45	18.341	-23.15	16.770	-22.34	13.157	-5.92	7.720	21.33	22.440	-10.56	21.120	-16.63	17.533	-15.12	7.50477	13
15	5.47	18.05	6.57	14.21	6.52	14.24	5.09	12.49	23.42	10.48	15.38	7.60	9.27	19.38	8.44	17.43	4.60	14.18		
	19.824	-21.06	18.543	-23.57	18.523	-23.12	16.869	-22.53	13.165	-5.95	7.709	21.36	22.446	-10.53	21.125	-16.61	17.538	-15.12	7.63619	15
17	5.46	18.08	7.02	14.26	6.55	14.27	5.08	12.46	23.35	10.41	15.29	7.51	9.19	19.31	8.36	17.36	4.52	14.10		
	19.967	-20.67	18.756	-23.61	18.705	-23.05	16.969	-22.71	13.171	-5.98	7.697	21.40	22.452	-10.49	21.130	-16.59	17.542	-15.12	7.76761	17
19	5.44	18.10	7.07	14.31	6.57	14.31	5.08	12.43	23.28	10.33	15.20	7.43	9.11	19.24	8.28	17.29	4.45	14.03		
	20.109	-20.26	18.972	-23.57	18.886	-22.93	17.069	-22.87	13.177	-6.01	7.685	21.43	22.458	-10.46	21.134	-16.57	17.547	-15.12	7.89903	19
21	5.43	18.13	7.11	14.38	6.58	14.35	5.07	12.40	23.20	10.25	15.11	7.35	9.04	19.17	8.21	17.21	4.37	13.55		
	20.250	-19.82	19.190	-23.44	19.067	-22.76	17.170	-23.02	13.182	-6.03	7.674	21.46	22.464	-10.42	21.139	-16.55	17.551	-15.12	8.03045	21
23	5.41	18.16	7.15	14.44	6.60	14.40	5.06	12.37	23.13	10.18	15.03	7.27	8.56	19.09	8.13	17.14	4.29	13.48		
	20.390	-19.36	19.411	-23.23	19.247	-22.54	17.271	-23.16	13.187	-6.05	7.663	21.49	22.470	-10.38	21.144	-16.52	17.555	-15.12	8.16188	23
25	5.39	18.19	7.18	14.52	7.01	14.45	5.05	12.34	23.05	10.10	14.54	7.18	8.48	19.02	8.05	17.06	4.22	13.40		
	20.530	-18.88	19.634	-22.93	19.427	-22.28	17.372	-23.28	13.190	-6.06	7.651	21.52	22.477	-10.34	21.149	-16.50	17.559	-15.12	8.29330	25
27	5.36	18.22	7.21	15.01	7.01	14.50	5.04	12.32	22.57	10.02	14.45	7.10	8.41	18.55	7.57	16.59	4.14	13.32		
	20.668	-18.37	19.859	-22.54	19.606	-21.98	17.473	-23.39	13.193	-6.07	7.640	21.55	22.483	-10.31	21.154	-16.48	17.564	-15.12	8.42472	27
29	5.34	18.25	7.23	15.10	7.02	14.55	5.03	12.29	22.50	9.54	14.36	7.02	8.33	18.47	7.50	16.51	4.07	13.25		
	20.805	-17.84	20.084	-22.06	19.785	-21.63	17.575	-23.49	13.195	-6.07	7.629	21.58	22.490	-10.27	21.159	-16.46	17.567	-15.12	8.55614	29
31	5.31	18.29	7.24	15.20	7.02	15.00	5.02	12.27	22.42	9.47	14.28	6.53	8.25	18.40	7.42	16.44	3.59	13.17		
	20.942	-17.29	20.312	-21.49	19.962	-21.24	17.677	-23.57	13.196	-6.07	7.619	21.61	22.497	-10.23	21.164	-16.44	17.571	-15.12	8.68755	31

LUTY 2005

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2453																			
32	1	Wto	403	21.01154	-13.34	21.0036	-17.00	0.98543	13.5926	-12.48	60.145	7.0	59	729	1159.3	1630	****	444.8	946	845	1	
33	2	Śro	404	21.05119	-13.42	21.0440	-16.43	0.98558	14.5009	-18.08	59.331	0.1	48	728	1159.4	1632	052	532.0	959	841	2	
34	3	Czw	405	21.09085	-13.48	21.0843	-16.25	0.98574	15.4521	-22.43	58.501	1.1	37	726	1159.6	1634	219	623.8	1018	837	3	
35	4	Pią	406	21.13050	-13.54	21.1246	-16.07	0.98590	16.4532	-26.06	57.711	2.1	27	724	1159.7	1636	349	721.2	1046	833	4	
36	5	Sob	407	21.17016	-13.59	21.1647	-15.49	0.98606	17.5010	-27.53	57.026	3.1	17	723	1159.7	1638	514	823.8	1131	829	5	
37	6	Nie	408	21.20582	-14.03	21.2048	-15.31	0.98623	18.5717	-27.44	56.518	4.1	9	721	1159.8	1640	623	929.7	1239	825	6	
38	7	Pon	409	21.24547	-14.07	21.2448	-15.12	0.98640	20.0400	-25.32	56.249	5.1	3	719	1159.9	1642	712	1035.5	1407	822	7	
39	8	Wto	410	21.28513	-14.10	21.2847	-14.53	0.98657	21.0746	-21.30	56.259	6.1	0	717	1159.9	1643	743	1138.2	1545	818	8	
40	9	Śro	411	21.32479	-14.11	21.3246	-14.34	0.98674	22.0715	-16.05	56.560	0.5	0	715	1159.9	1645	803	1235.8	1723	814	9	
41	10	Czw	412	21.36444	-14.12	21.3643	-14.14	0.98692	23.0227	-9.48	57.129	1.5	3	713	1160.0	1647	818	1328.8	1856	810	10	
42	11	Pią	413	21.40409	-14.13	21.4040	-13.55	0.98710	23.5413	-3.10	57.912	2.5	9	711	1160.0	1649	830	1418.0	2024	806	11	
43	12	Sob	414	21.44375	-14.12	21.4436	-13.35	0.98728	0.4344	3.26	58.837	3.5	16	709	1160.0	1651	840	1504.9	2149	802	12	
44	13	Nie	415	21.48341	-14.11	21.4832	-13.14	0.98747	1.3212	9.40	59.820	4.5	25	707	1159.9	1653	851	1550.8	2311	758	13	
45	14	Pon	416	21.52306	-14.09	21.5226	-12.54	0.98765	2.2040	15.16	60.783	5.5	35	705	1159.9	1655	902	1636.8	****	754	14	
46	15	Wto	417	21.56272	-14.06	21.5620	-12.34	0.98784	3.0960	20.03	61.661	6.5	45	703	1159.9	1657	916	1724.0	033	750	15	
47	16	Śro	418	22.00237	-14.03	22.0013	-12.13	0.98804	4.0041	23.51	62.403	0.4	54	701	1159.8	1659	935	1812.6	152	746	16	
48	17	Czw	419	22.04203	-13.59	22.0405	-11.52	0.98824	4.5250	26.30	62.978	1.4	64	659	1159.7	1701	1000	1902.9	309	742	17	
49	18	Pią	420	22.08168	-13.54	22.0757	-11.31	0.98844	5.4605	27.55	63.370	2.4	73	657	1159.6	1703	1037	1954.2	418	738	18	
50	19	Sob	421	22.12134	-13.48	22.1148	-11.09	0.98864	6.3941	28.03	63.580	3.4	81	655	1159.5	1705	1126	2045.5	514	734	19	
51	20	Nie	422	22.16100	-13.42	22.1538	-10.48	0.98885	7.3240	26.53	63.620	4.4	88	653	1159.4	1707	1229	2135.8	557	730	20	
52	21	Pon	423	22.20065	-13.35	22.1928	-10.26	0.98907	8.2412	24.30	63.512	5.4	93	651	1159.3	1709	1340	2224.1	627	727	21	
53	22	Wto	424	22.24031	-13.27	22.2317	-10.04	0.98929	9.1347	21.03	63.280	6.4	97	649	1159.2	1711	1456	2310.3	649	723	22	
54	23	Śro	425	22.27596	-13.19	22.2705	-9.42	0.98951	10.0119	16.41	62.952	7.4	99	646	1159.1	1713	1613	2354.3	704	719	23	
55	24	Czw	426	22.31562	-13.10	22.3053	-9.20	0.98974	10.4708	11.37	62.550	0.3	100	644	1158.9	1715	1729	*****	716	715	24	
56	25	Pią	427	22.35527	-13.01	22.3440	-8.58	0.98997	11.3151	6.02	62.094	1.3	98	642	1158.8	1716	1845	036.8	726	711	25	
57	26	Sob	428	22.39493	-12.51	22.3826	-8.35	0.99021	12.1615	0.08	61.597	2.3	95	640	1158.6	1718	2001	118.4	735	707	26	
58	27	Nie	429	22.43458	-12.40	22.4212	-8.13	0.99045	13.0118	-5.51	61.067	3.3	90	638	1158.4	1720	2119	200.3	744	703	27	
59	28	Pon	430	22.47424	-12.29	22.4558	-7.50	0.99069	13.4804	-11.42	60.507	4.3	83	635	1158.2	1722	2240	243.6	754	659	28	

Fazy Księżyca [Dm, h.mm]: 3kw 2, 8.27 Now 8, 23.28 1kw 16, 1.16 Pełn 24, 5.54

LUTY 2005 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	5.30	18.30	7.25	15.25	7.02	15.03	5.01	12.26	22.38	9.43	14.23	6.49	8.21	18.37	7.38	16.40	3.55	13.13		
	21.010	-17.00	20.425	-21.16	20.050	-21.02	17.728	-23.60	13.197	-6.07	7.613	21.62	22.500	-10.21	21.167	-16.43	17.573	-15.12	8.75326	1
3	5.27	18.34	7.26	15.36	7.01	15.09	5.00	12.23	22.30	9.35	14.15	6.41	8.14	18.29	7.30	16.33	3.48	13.06		
	21.145	-16.42	20.654	-20.45	20.226	-20.57	17.831	-23.66	13.197	-6.06	7.603	21.65	22.507	-10.17	21.172	-16.40	17.577	-15.12	8.88468	3
5	5.24	18.37	7.26	15.47	7.00	15.15	4.59	12.21	22.22	9.27	14.06	6.33	8.06	18.22	7.23	16.25	3.40	12.58		
	21.280	-15.82	20.883	-19.63	20.400	-20.07	17.933	-23.70	13.196	-6.05	7.593	21.68	22.514	-10.13	21.177	-16.38	17.580	-15.12	9.01611	5
7	5.21	18.40	7.26	15.59	6.59	15.21	4.57	12.19	22.14	9.19	13.57	6.24	7.58	18.15	7.15	16.18	3.32	12.50		
	21.413	-15.20	21.113	-18.72	20.574	-19.53	18.036	-23.73	13.194	-6.03	7.583	21.70	22.521	-10.08	21.182	-16.36	17.584	-15.12	9.14753	7
9	5.18	18.44	7.25	16.11	6.58	15.27	4.56	12.18	22.06	9.11	13.49	6.16	7.51	18.08	7.07	16.11	3.25	12.43		
	21.546	-14.56	21.344	-17.72	20.746	-18.96	18.139	-23.75	13.192	-6.00	7.574	21.73	22.528	-10.04	21.187	-16.34	17.587	-15.12	9.27895	9
11	5.15	18.47	7.24	16.24	6.56	15.34	4.54	12.16	21.58	9.03	13.40	6.08	7.43	18.01	6.60	16.03	3.17	12.35		
	21.678	-13.91	21.575	-16.62	20.917	-18.35	18.242	-23.75	13.189	-5.98	7.564	21.75	22.535	-10.00	21.192	-16.32	17.590	-15.11	9.41037	11
13	5.11	18.51	7.23	16.38	6.54	15.40	4.52	12.14	21.49	8.55	13.32	5.60	7.35	17.53	6.52	15.56	3.09	12.27		
	21.809	-13.24	21.806	-15.42	21.086	-17.70	18.345	-23.73	13.185	-5.94	7.556	21.77	22.542	-9.96	21.197	-16.30	17.594	-15.11	9.54178	13
15	5.08	18.54	7.21	16.51	6.52	15.47	4.50	12.13	21.41	8.48	13.23	5.51	7.28	17.46	6.44	15.48	3.01	12.20		
	21.939	-12.56	22.037	-14.12	21.255	-17.02	18.449	-23.70	13.180	-5.91	7.547	21.80	22.549	-9.92	21.202	-16.27	17.596	-15.11	9.67320	15
17	5.04	18.58	7.19	17.05	6.50	15.53	4.48	12.12	21.33	8.40	13.15	5.43	7.20	17.39	6.37	15.41	2.54	12.12		
	22.068	-11.86	22.269	-12.74	21.422	-16.31	18.552	-23.66	13.175	-5.86	7.539	21.82	22.556	-9.87	21.207	-16.25	17.599	-15.11	9.80462	17
19	4.60	19.01	7.17	17.20	6.47	15.60	4.46	12.10	21.24	8.32	13.06	5.35	7.12	17.32	6.29	15.33	2.46	12.04		
	22.197	-11.15	22.500	-11.26	21.587	-15.56	18.655	-23.59	13.169	-5.82	7.531	21.84	22.564	-9.83	21.212	-16.23	17.602	-15.10	9.93604	19
21	4.56	19.05	7.14	17.35	6.45	16.07	4.44	12.09	21.16	8.24	12.58	5.27	7.05	17.25	6.21	15.26	2.38	11.57		
	22.324	-10.43	22.730	-9.70	21.752	-14.79	18.759	-23.52	13.162	-5.77	7.524	21.86	22.571	-9.79	21.217	-16.21	17.605	-15.10	10.06747	21
23	4.52	19.09	7.10	17.49	6.42	16.13	4.41	12.08	21.07	8.16	12.49	5.19	6.57	17.17	6.13	15.19	2.31	11.49		
	22.451	-9.70	22.959	-8.07	21.915	-14.00	18.862	-23.43	13.154	-5.71	7.517	21.87	22.578	-9.75	21.222	-16.19	17.607	-15.10	10.19889	23
25	4.47	19.12	7.07	18.04	6.39	16.20	4.39	12.07	20.58	8.08	12.41	5.11	6.49	17.10	6.06	15.11	2.23	11.41		
	22.578	-8.96	23.185	-6.37	22.076	-13.17	18.966	-23.32	13.146	-5.66	7.511	21.89	22.585	-9.70	21.227	-16.17	17.609	-15.09	10.33030	25
27	4.43	19.16	7.03	18.19	6.35	16.27	4.36	12.07	20.50	7.59	12.33	5.03	6.42	17.03	5.58	15.04	2.15	11.34		
	22.703	-8.21	23.407	-4.63	22.237	-12.32	19.069	-23.20	13.137	-5.59	7.505	21.91	22.593	-9.66	21.231	-16.15	17.611	-15.09	10.46172	27

MARZEC 2005

Piwnice, CA UMK				← Dane na godz. 12 czasu strefowego (= 11 lub 10 ^h UT) →										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2453																			
60	1	Wto	431	22.51389	-12.17	22.4943	-7.27	0.99094	14.3736	-17.09	59.924	5.3	74	633	1158.0	1724	****	329.4	806	655	1	
61	2	Śro	432	22.55355	-12.05	22.5327	-7.05	0.99119	15.3053	-21.53	59.324	6.3	64	631	1157.8	1726	005	419.1	822	651	2	
62	3	Czw	433	22.59320	-11.53	22.5711	-6.42	0.99145	16.2829	-25.33	58.724	7.3	53	628	1157.6	1728	133	513.4	846	647	3	
63	4	Pią	434	23.03286	-11.40	23.0055	-6.18	0.99170	17.3008	-27.45	58.151	0.7	42	626	1157.4	1730	258	612.4	922	643	4	
64	5	Sob	435	23.07252	-11.26	23.0438	-5.55	0.99196	18.3432	-28.11	57.642	1.7	31	624	1157.2	1732	412	715.1	1019	639	5	
65	6	Nie	436	23.11217	-11.13	23.0821	-5.32	0.99222	19.3926	-26.43	57.243	2.7	20	621	1157.0	1733	506	818.8	1137	635	6	
66	7	Pon	437	23.15183	-10.58	23.1203	-5.09	0.99249	20.4231	-23.25	57.002	3.7	12	619	1156.7	1735	543	920.9	1309	631	7	
67	8	Wto	438	23.19148	-10.44	23.1545	-4.45	0.99275	21.4217	-18.36	56.960	4.7	5	617	1156.5	1737	606	1019.3	1446	628	8	
68	9	Śro	439	23.23114	-10.29	23.1927	-4.22	0.99301	22.3822	-12.40	57.144	5.7	1	614	1156.2	1739	623	1113.6	1620	624	9	
69	10	Czw	440	23.27079	-10.14	23.2308	-3.58	0.99328	23.3115	-6.07	57.556	0.1	0	612	1156.0	1741	636	1204.3	1751	620	10	
70	11	Pią	441	23.31045	-9.58	23.2649	-3.35	0.99354	0.2154	0.38	58.172	1.1	2	610	1155.7	1743	646	1252.5	1918	616	11	
71	12	Sob	442	23.35010	-9.42	23.3030	-3.11	0.99381	1.1125	7.12	58.945	2.1	6	607	1155.4	1745	657	1339.6	2043	612	12	
72	13	Nie	443	23.38576	-9.26	23.3410	-2.48	0.99407	2.0050	13.15	59.812	3.1	12	605	1155.2	1746	708	1426.6	2208	608	13	
73	14	Pon	444	23.42541	-9.09	23.3750	-2.24	0.99434	2.5059	18.31	60.701	4.1	19	603	1154.9	1748	720	1514.4	2331	604	14	
74	15	Wto	445	23.46507	-8.53	23.4130	-2.00	0.99461	3.4223	22.48	61.543	5.1	28	600	1154.6	1750	737	1603.7	****	600	15	
75	16	Śro	446	23.50472	-8.36	23.4509	-1.36	0.99487	4.3510	25.56	62.278	6.1	37	558	1154.3	1752	759	1654.5	051	556	16	
76	17	Czw	447	23.54438	-8.18	23.4849	-1.13	0.99514	5.2859	27.47	62.858	7.1	47	555	1154.1	1754	831	1746.3	205	552	17	
77	18	Pią	448	23.58404	-8.01	23.5228	-0.49	0.99541	6.2306	28.19	63.254	0.7	56	553	1153.8	1755	916	1838.3	308	548	18	
78	19	Sob	449	0.02369	-7.43	23.5607	-0.25	0.99569	7.1637	27.31	63.450	1.7	65	551	1153.5	1757	1015	1929.2	356	544	19	
79	20	Nie	450	0.06335	-7.26	23.5946	-0.02	0.99596	8.0841	25.29	63.450	2.7	74	548	1153.2	1759	1124	2018.4	431	540	20	
80	21	Pon	451	0.10300	-7.08	0.0324	0.22	0.99623	8.5848	22.19	63.270	3.7	82	546	1152.9	1801	1239	2105.3	455	536	21	
81	22	Wto	452	0.14266	-6.50	0.0703	0.46	0.99651	9.4653	18.12	62.936	4.7	89	543	1152.6	1803	1355	2150.0	512	532	22	
82	23	Śro	453	0.18231	-6.32	0.1041	1.09	0.99679	10.3313	13.17	62.485	5.7	94	541	1152.3	1805	1512	2233.1	524	529	23	
83	24	Czw	454	0.22197	-6.13	0.1420	1.33	0.99707	11.1824	7.47	61.955	6.7	98	539	1152.0	1806	1628	2315.2	535	525	24	
84	25	Pią	455	0.26162	-5.55	0.1758	1.57	0.99736	12.0313	1.52	61.384	7.7	100	536	1151.7	1808	1745	2357.5	544	521	25	
85	26	Sob	456	0.30128	-5.37	0.2136	2.20	0.99764	12.4835	-4.14	60.809	0.6	100	534	1151.4	1810	1904	*****	553	517	26	
86	27	Nie	457	0.34093	-5.19	0.2515	2.44	0.99793	13.3532	-10.16	60.255	1.6	97	531	1151.1	1812	2026	040.9	602	513	27	
86	27	Nie	457	23.33595	-5.19	0.2505	2.43	0.99792	13.3332	-10.01	60.278	1.5	97	632	1251.1	1912	2126	140.9	702	613	27	
87	28	Pon	458	23.37560	-5.01	0.2844	3.06	0.99821	14.2255	-15.44	59.763	2.5	93	629	1250.8	1914	2251	226.6	713	609	28	
88	29	Wto	459	23.41526	-4.43	0.3222	3.30	0.99850	15.1546	-20.47	59.298	3.5	86	627	1250.5	1915	****	315.7	728	605	29	
89	30	Śro	460	23.45491	-4.25	0.3601	3.53	0.99879	16.1236	-24.48	58.887	4.5	78	624	1250.2	1917	020	409.1	749	601	30	
90	31	Czw	461	23.49457	-4.07	0.3939	4.16	0.99908	17.1313	-27.26	58.530	5.5	68	622	1249.9	1919	147	506.9	821	557	31	

Fazy Księżycyca [Dm, h.mm]: 3kw 3, 18.36 Nów 10, 10.10 1kw 17, 20.19 Pełn 25, 21.59 Pełn 25, 22.59

MARZEC 2005 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE			MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST		Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0 ^h UT)	Dm		
1	4.39	19.20	6.59	18.34	6.32	16.33	4.34	12.06	20.41	7.51	12.24	4.54	6.34	16.56	5.50	14.56	2.07	11.26				
	22.829	-7.46	23.624	-2.86	22.397	-11.45	19.172	-23.07	13.127	-5.53	7.499	21.92	22.600	-9.62	21.236	-16.12	17.613	-15.08	10.59314	1		
3	4.34	19.24	6.54	18.48	6.29	16.40	4.31	12.05	20.32	7.43	12.16	4.46	6.26	16.49	5.43	14.49	1.59	11.18				
	22.953	-6.69	23.832	-1.09	22.555	-10.56	19.275	-22.92	13.117	-5.46	7.494	21.94	22.607	-9.58	21.241	-16.10	17.615	-15.08	10.72456	3		
5	4.29	19.27	6.48	19.01	6.25	16.47	4.28	12.05	20.23	7.35	12.08	4.38	6.19	16.41	5.35	14.41	1.52	11.10				
	23.077	-5.92	0.029	0.65	22.713	-9.65	19.378	-22.76	13.106	-5.38	7.490	21.95	22.614	-9.53	21.245	-16.08	17.617	-15.07	10.85598	5		
7	4.24	19.31	6.43	19.13	6.22	16.53	4.25	12.04	20.14	7.27	11.60	4.30	6.11	16.34	5.27	14.34	1.44	11.03				
	23.201	-5.15	0.211	2.31	22.869	-8.73	19.481	-22.58	13.095	-5.31	7.486	21.96	22.621	-9.49	21.250	-16.06	17.619	-15.07	10.98740	7		
9	4.19	19.35	6.36	19.23	6.18	16.60	4.22	12.04	20.05	7.19	11.51	4.22	6.03	16.27	5.19	14.26	1.36	10.55				
	23.324	-4.36	0.373	3.85	23.025	-7.79	19.584	-22.39	13.083	-5.23	7.482	21.97	22.628	-9.45	21.254	-16.04	17.620	-15.06	11.11882	9		
11	4.14	19.39	6.29	19.31	6.14	17.06	4.19	12.04	19.56	7.11	11.43	4.14	5.56	16.20	5.12	14.19	1.28	10.47				
	23.447	-3.58	0.513	5.24	23.180	-6.83	19.687	-22.18	13.070	-5.14	7.479	21.98	22.636	-9.41	21.259	-16.03	17.621	-15.06	11.25023	11		
13	4.09	19.43	6.22	19.36	6.10	17.13	4.15	12.04	19.47	7.03	11.35	4.06	5.48	16.13	5.04	14.11	1.20	10.39				
	23.569	-2.79	0.626	6.43	23.334	-5.86	19.789	-21.96	13.057	-5.06	7.477	21.99	22.643	-9.37	21.263	-16.01	17.622	-15.05	11.38165	13		
15	4.04	19.48	6.13	19.39	6.06	17.20	4.12	12.04	19.38	6.54	11.27	3.58	5.40	16.05	4.56	14.04	1.13	10.32				
	23.692	-2.00	0.709	7.39	23.487	-4.89	19.891	-21.73	13.043	-4.97	7.475	22.00	22.650	-9.32	21.267	-15.99	17.623	-15.05	11.51307	15		
17	3.59	19.52	6.05	19.38	6.02	17.26	4.08	12.04	19.29	6.46	11.19	3.51	5.33	15.58	4.49	13.56	1.05	10.24				
	23.814	-1.21	0.760	8.09	23.640	-3.90	19.993	-21.48	13.029	-4.88	7.473	22.00	22.657	-9.28	21.271	-15.97	17.624	-15.04	11.64449	17		
19	3.54	19.56	5.56	19.33	5.58	17.33	4.05	12.04	19.19	6.38	11.11	3.43	5.25	15.51	4.41	13.49	0.57	10.16				
	23.935	-0.42	0.780	8.51	23.793	-2.90	20.094	-21.22	13.015	-4.78	7.472	22.01	22.663	-9.24	21.275	-15.95	17.625	-15.04	11.77591	19		
21	3.48	20.00	5.47	19.25	5.54	17.39	4.01	12.04	19.10	6.30	11.03	3.35	5.17	15.44	4.33	13.41	0.49	10.08				
	0.057	0.37	0.767	8.63	23.945	-1.90	20.196	-20.94	13.000	-4.69	7.472	22.01	22.670	-9.20	21.279	-15.93	17.625	-15.03	11.90733	21		
23	3.42	20.05	5.37	19.14	5.50	17.46	3.57	12.04	19.01	6.21	10.55	3.27	5.10	15.36	4.25	13.34	0.41	10.00				
	0.178	1.16	0.726	8.46	0.097	-0.90	20.297	-20.66	12.986	-4.59	7.472	22.01	22.677	-9.16	21.283	-15.92	17.626	-15.03	12.03875	23		
25	3.37	20.09	5.28	18.60	5.46	17.52	3.53	12.04	18.52	6.13	10.48	3.19	5.02	15.29	4.18	13.26	0.33	9.53				
	0.299	1.94	0.661	8.01	0.248	0.10	20.397	-20.36	12.970	-4.50	7.473	22.02	22.684	-9.12	21.287	-15.90	17.626	-15.02	12.17016	25		
27	3.31	20.14	5.19	18.43	5.42	17.59	3.49	12.04	18.42	6.05	10.40	3.11	4.54	15.22	4.10	13.19	0.25	9.45				
	0.421	2.73	0.579	7.31	0.400	1.11	20.498	-20.05	12.955	-4.40	7.474	22.02	22.690	-9.09	21.290	-15.88	17.626	-15.01	12.30158	27		
27	4.31	21.14	6.19	19.43	6.42	18.59	4.49	13.04	19.42	7.05	11.40	4.11	5.54	16.22	5.10	14.19	1.25	10.45				
	0.418	2.71	0.580	7.33	0.397	1.09	20.496	-20.05	12.955	-4.40	7.474	22.02	22.690	-9.09	21.290	-15.88	17.626	-15.01	12.30158	27		
29	4.25	21.19	6.10	19.25	6.37	19.05	4.45	13.05	19.33	6.57	11.32	4.04	5.47	16.15	5.02	14.11	1.17	10.37				
	0.539	3.49	0.488	6.44	0.548	2.10	20.596	-19.73	12.940	-4.30	7.476	22.02	22.697	-9.05	21.294	-15.87	17.626	-15.01	12.43300	29		
31	4.19	21.23	6.02	19.06	6.33	19.12	4.41	13.05	19.24	6.48	11.24	3.56	5.39	16.07	4.54	14.04	1.10	10.29				
	0.661	4.27	0.394	5.43	0.700	3.10	20.695	-19.39	12.924	-4.20	7.478	22.01	22.703	-9.01	21.297	-15.85	17.626	-15.00	12.56442	31		

KWIECIEŃ 2005

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)											Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2453																			
91	1	Pią	462	23.53423	-3.49	0.4318	4.39	0.99938	18.1626	-28.22	58.231	6.5	57	620	1249.6	1921	305	608.1	910	553	1	
92	2	Sob	463	23.57388	-3.31	0.4657	5.02	0.99967	19.2014	-27.28	57.995	0.4	46	617	1249.3	1923	405	710.7	1021	549	2	
93	3	Nie	464	0.01354	-3.14	0.5035	5.25	0.99996	20.2226	-24.46	57.836	1.4	34	615	1249.0	1924	445	811.8	1147	545	3	
94	4	Pon	465	0.05319	-2.56	0.5415	5.48	1.00026	21.2136	-20.32	57.775	2.4	24	612	1248.7	1926	511	909.8	1320	541	4	
95	5	Wto	466	0.09285	-2.39	0.5754	6.11	1.00055	22.1715	-15.06	57.832	3.4	15	610	1248.4	1928	529	1003.8	1453	537	5	
96	6	Śro	467	0.13250	-2.22	1.0133	6.34	1.00084	23.0949	-8.54	58.028	4.4	7	608	1248.1	1930	543	1054.3	1622	534	6	
97	7	Czw	468	0.17216	-2.05	1.0513	6.56	1.00113	0.0012	-2.17	58.373	5.4	3	605	1247.8	1931	554	1142.3	1749	530	7	
98	8	Pią	469	0.21181	-1.48	1.0853	7.19	1.00142	0.4927	4.20	58.863	6.4	0	603	1247.6	1933	604	1229.1	1915	526	8	
99	9	Sob	470	0.25147	-1.32	1.1233	7.41	1.00170	1.3837	10.39	59.479	0.6	0	601	1247.3	1935	614	1315.8	2039	522	9	
100	10	Nie	471	0.29112	-1.16	1.1614	8.03	1.00199	2.2835	16.20	60.182	1.6	3	558	1247.0	1937	626	1403.4	2204	518	10	
101	11	Pon	472	0.33078	-0.60	1.1954	8.26	1.00227	3.1958	21.08	60.925	2.6	7	556	1246.7	1939	640	1452.7	2327	514	11	
102	12	Wto	473	0.37043	-0.44	1.2335	8.47	1.00255	4.1258	24.50	61.651	3.6	14	554	1246.5	1940	700	1543.7	****	510	12	
103	13	Śro	474	0.41009	-0.29	1.2717	9.09	1.00283	5.0716	27.16	62.304	4.6	21	551	1246.2	1942	728	1636.0	046	506	13	
104	14	Czw	475	0.44574	-0.14	1.3058	9.31	1.00311	6.0207	28.20	62.834	5.6	30	549	1246.0	1944	807	1728.8	156	502	14	
105	15	Pią	476	0.48540	0.01	1.3440	9.52	1.00338	6.5629	28.02	63.200	6.6	39	547	1245.7	1946	901	1820.7	251	458	15	
106	16	Sob	477	0.52506	0.15	1.3822	10.14	1.00365	7.4924	26.26	63.375	7.6	48	545	1245.5	1948	1006	1910.8	331	454	16	
107	17	Nie	478	0.56471	0.29	1.4205	10.35	1.00393	8.4015	23.40	63.347	0.8	58	542	1245.3	1949	1119	1958.6	358	450	17	
108	18	Pon	479	1.00437	0.42	1.4548	10.56	1.00420	9.2851	19.54	63.120	1.8	67	540	1245.0	1951	1235	2043.9	418	446	18	
109	19	Wto	480	1.04402	0.55	1.4931	11.17	1.00447	10.1531	15.18	62.711	2.8	76	538	1244.8	1953	1352	2127.3	432	442	19	
110	20	Śro	481	1.08368	1.08	1.5315	11.37	1.00474	11.0048	10.01	62.156	3.8	84	536	1244.6	1955	1508	2209.5	443	438	20	
111	21	Czw	482	1.12333	1.21	1.5659	11.58	1.00501	11.4533	4.15	61.496	4.8	90	533	1244.4	1957	1624	2251.5	452	435	21	
112	22	Pią	483	1.16299	1.33	2.0044	12.18	1.00528	12.3043	-1.49	60.784	5.8	95	531	1244.2	1958	1743	2334.6	501	431	22	
113	23	Sob	484	1.20264	1.44	2.0429	12.38	1.00555	13.1720	-7.58	60.073	6.8	99	529	1244.0	2000	1904	*****	510	427	23	
114	24	Nie	485	1.24230	1.55	2.0814	12.58	1.00582	14.0632	-13.56	59.414	7.8	100	527	1243.8	2002	2029	019.8	521	423	24	
115	25	Pon	486	1.28195	2.06	2.1200	13.17	1.00608	14.5916	-19.20	58.847	1.0	99	525	1243.7	2004	2159	108.4	534	419	25	
116	26	Wto	487	1.32161	2.16	2.1547	13.37	1.00635	15.5613	-23.48	58.403	2.0	95	523	1243.5	2005	2330	201.4	553	415	26	
117	27	Śro	488	1.36127	2.25	2.1934	13.56	1.00662	16.5716	-26.54	58.092	3.0	89	521	1243.3	2007	****	259.2	621	411	27	
118	28	Czw	489	1.40092	2.34	2.2322	14.15	1.00688	18.0111	-28.18	57.914	4.0	81	519	1243.2	2009	054	400.9	705	407	28	
119	29	Pią	490	1.44058	2.43	2.2710	14.33	1.00715	19.0548	-27.49	57.858	5.0	71	517	1243.0	2011	201	504.3	810	403	29	
120	30	Sob	491	1.48023	2.51	2.3058	14.52	1.00741	20.0843	-25.30	57.906	6.0	60	514	1242.9	2013	247	606.5	933	359	30	

Fazy Księżyca [Dm, h.mm]: 3kw 2, 2.50 Now 8, 22.32 1kw 16, 16.37 Pełn 24, 12.07

MAJ 2005

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2453																					
121	1	Nie	492	1.51589	2.58	2.3447	15.10	1.00767	21.0816	-21.36	58.042	0.1	48	512	1242.8	2014	317	705.3	1104	355	1
122	2	Pon	493	1.55554	3.05	2.3837	15.28	1.00793	22.0355	-16.30	58.252	1.1	37	510	1242.7	2016	337	759.7	1236	351	2
123	3	Wto	494	1.59520	3.11	2.4227	15.46	1.00819	22.5607	-10.34	58.532	2.1	26	509	1242.6	2018	351	850.1	1405	347	3
124	4	Śro	495	2.03486	3.17	2.4618	16.03	1.00844	23.4548	-4.12	58.878	3.1	17	507	1242.5	2020	402	937.6	1530	343	4
125	5	Czw	496	2.07451	3.22	2.5009	16.20	1.00869	0.3408	2.18	59.291	4.1	10	505	1242.4	2021	412	1023.4	1654	339	5
126	6	Pią	497	2.11417	3.27	2.5401	16.37	1.00894	1.2214	8.36	59.770	5.1	4	503	1242.3	2023	422	1109.0	1817	336	6
127	7	Sob	498	2.15382	3.31	2.5754	16.54	1.00918	2.1108	14.26	60.308	6.1	1	501	1242.2	2025	433	1155.4	1940	332	7
128	8	Nie	499	2.19348	3.34	3.0147	17.10	1.00942	3.0134	19.32	60.890	0.1	0	459	1242.2	2026	446	1243.5	2104	328	8
129	9	Pon	500	2.23313	3.37	3.0541	17.26	1.00965	3.5354	23.37	61.488	1.1	1	457	1242.1	2028	503	1333.6	2225	324	9
130	10	Wto	501	2.27279	3.39	3.0935	17.42	1.00988	4.4759	26.31	62.069	2.1	4	456	1242.1	2030	527	1425.7	2339	320	10
131	11	Śro	502	2.31244	3.41	3.1330	17.57	1.01011	5.4304	28.03	62.594	3.1	9	454	1242.1	2031	602	1518.8	****	316	11
132	12	Czw	503	2.35210	3.42	3.1725	18.13	1.01033	6.3805	28.13	63.021	4.1	16	452	1242.0	2033	650	1611.6	041	312	12
133	13	Pią	504	2.39176	3.43	3.2121	18.28	1.01055	7.3150	27.02	63.311	5.1	23	450	1242.0	2035	751	1702.8	127	308	13
134	14	Sob	505	2.43141	3.43	3.2518	18.42	1.01076	8.2328	24.38	63.433	6.1	32	449	1242.0	2036	902	1751.5	200	304	14
135	15	Nie	506	2.47107	3.42	3.2915	18.56	1.01097	9.1239	21.11	63.365	7.1	41	447	1242.0	2038	1017	1837.6	222	300	15
136	16	Pon	507	2.51072	3.41	3.3312	19.10	1.01118	9.5933	16.53	63.099	0.0	50	446	1242.1	2040	1133	1921.2	238	256	16
137	17	Wto	508	2.55038	3.40	3.3711	19.24	1.01138	10.4443	11.53	62.640	1.0	60	444	1242.1	2041	1248	2003.3	250	252	17
138	18	Śro	509	2.59003	3.38	3.4109	19.37	1.01158	11.2859	6.21	62.012	2.0	69	442	1242.1	2043	1403	2044.7	300	248	18
139	19	Czw	510	3.02569	3.35	3.4508	19.50	1.01178	12.1321	0.27	61.253	3.0	78	441	1242.2	2044	1519	2126.6	309	244	19
140	20	Pią	511	3.06534	3.32	3.4908	20.03	1.01197	12.5855	-5.39	60.414	4.0	86	440	1242.2	2046	1638	2210.3	318	241	20
141	21	Sob	512	3.10500	3.28	3.5309	20.15	1.01216	13.4652	-11.40	59.559	5.0	93	438	1242.3	2047	1801	2257.3	327	237	21
142	22	Nie	513	3.14466	3.24	3.5709	20.27	1.01236	14.3823	-17.20	58.754	6.0	97	437	1242.3	2049	1929	2348.7	339	233	22
143	23	Pon	514	3.18431	3.19	4.0111	20.38	1.01254	15.3427	-22.15	58.064	7.0	100	436	1242.4	2050	2102	*****	356	229	23
144	24	Wto	515	3.22397	3.14	4.0512	20.49	1.01273	16.3519	-25.56	57.540	0.6	100	434	1242.5	2052	2232	045.5	420	225	24
145	25	Śro	516	3.26362	3.08	4.0915	21.00	1.01291	17.4007	-27.58	57.218	1.6	97	433	1242.6	2053	2349	147.3	458	221	25
146	26	Czw	517	3.30328	3.02	4.1318	21.11	1.01309	18.4637	-28.04	57.108	2.6	91	432	1242.7	2054	****	252.3	556	217	26
147	27	Pią	518	3.34294	2.55	4.1721	21.21	1.01327	19.5156	-26.10	57.198	3.6	83	431	1242.8	2056	044	357.2	716	213	27
148	28	Sob	519	3.38259	2.48	4.2125	21.31	1.01345	20.5348	-22.34	57.460	4.6	73	430	1243.0	2057	120	458.9	848	209	28
149	29	Nie	520	3.42225	2.40	4.2529	21.40	1.01362	21.5113	-17.38	57.854	5.6	62	429	1243.1	2058	143	555.8	1022	205	29
150	30	Pon	521	3.46190	2.32	4.2934	21.49	1.01379	22.4428	-11.49	58.338	6.6	51	428	1243.2	2100	159	647.8	1152	201	30
151	31	Wto	522	3.50156	2.23	4.3339	21.57	1.01395	23.3432	-5.32	58.875	0.9	40	427	1243.4	2101	211	736.0	1318	157	31

Fazy Księżyca [Dm, h.mm]: 3kw 1, 8.24 Now 8, 10.45 1kw 16, 10.56 Pełn 23, 22.18 3kw 30, 13.47

MAJ 2005 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT) Dm
1	2.31	22.59	4.48	17.26	5.36	20.56	3.29	13.13	17.01	4.40	9.30	1.59	3.39	14.13	2.54	12.05	23.02	8.26	
	2.580	15.17	0.974	3.07	3.125	17.15	22.192	-12.91	12.696	-2.81	7.575	21.84	22.787	-8.52	21.334	-15.69	17.604	-14.92	14.60142 1
3	2.23	23.08	4.44	17.32	5.33	21.03	3.23	13.13	16.52	4.32	9.22	1.51	3.31	14.06	2.46	11.57	22.54	8.18	
	2.708	15.76	1.127	3.99	3.290	17.87	22.286	-12.43	12.684	-2.74	7.585	21.82	22.791	-8.50	21.335	-15.69	17.602	-14.91	14.73284 3
5	2.13	23.17	4.41	17.40	5.30	21.09	3.18	13.14	16.43	4.24	9.15	1.44	3.24	13.58	2.38	11.49	22.46	8.10	
	2.836	16.34	1.289	4.99	3.456	18.57	22.379	-11.94	12.673	-2.67	7.596	21.80	22.795	-8.47	21.337	-15.68	17.599	-14.91	14.86426 5
7	2.03	23.27	4.37	17.48	5.28	21.16	3.13	13.14	16.34	4.16	9.08	1.36	3.16	13.51	2.30	11.42	22.38	8.02	
	2.965	16.90	1.460	6.07	3.623	19.24	22.471	-11.44	12.662	-2.61	7.606	21.78	22.799	-8.45	21.338	-15.68	17.597	-14.91	14.99567 7
9	1.52	23.39	4.34	17.57	5.26	21.23	3.08	13.15	16.25	4.08	9.01	1.29	3.08	13.43	2.22	11.34	22.30	7.54	
	3.095	17.44	1.639	7.22	3.791	19.87	22.564	-10.94	12.652	-2.56	7.617	21.76	22.803	-8.43	21.338	-15.67	17.594	-14.90	15.12709 9
11	1.40	23.52	4.31	18.07	5.24	21.29	3.03	13.15	16.17	3.59	8.54	1.22	3.00	13.36	2.15	11.26	22.22	7.46	
	3.225	17.96	1.828	8.43	3.961	20.47	22.655	-10.44	12.643	-2.50	7.629	21.73	22.806	-8.41	21.339	-15.67	17.591	-14.90	15.25852 11
13	1.24	0.21	4.27	18.18	5.22	21.35	2.57	13.16	16.08	3.51	8.47	1.14	2.53	13.28	2.07	11.18	22.14	7.38	
	3.356	18.46	2.026	9.70	4.132	21.03	22.747	-9.93	12.634	-2.45	7.641	21.71	22.809	-8.39	21.340	-15.67	17.589	-14.90	15.38994 13
15	****	****	4.25	18.30	5.21	21.42	2.52	13.16	15.59	3.43	8.40	1.07	2.45	13.21	1.59	11.10	22.06	7.30	
	3.487	18.94	2.234	11.01	4.304	21.55	22.838	-9.41	12.626	-2.41	7.653	21.68	22.813	-8.37	21.340	-15.67	17.586	-14.89	15.52136 15
17	****	****	4.22	18.43	5.20	21.48	2.47	13.17	15.51	3.35	8.33	0.60	2.37	13.13	1.51	11.02	21.58	7.22	
	3.620	19.40	2.452	12.36	4.477	22.03	22.928	-8.90	12.619	-2.37	7.666	21.65	22.816	-8.36	21.340	-15.67	17.583	-14.89	15.65278 17
19	****	****	4.20	18.57	5.19	21.54	2.42	13.17	15.42	3.27	8.27	0.52	2.29	13.05	1.43	10.55	21.49	7.14	
	3.752	19.83	2.681	13.73	4.651	22.47	23.019	-8.38	12.612	-2.34	7.679	21.63	22.818	-8.34	21.340	-15.67	17.579	-14.89	15.78420 19
21	****	****	4.18	19.12	5.19	21.59	2.36	13.17	15.34	3.19	8.20	0.45	2.22	12.58	1.35	10.47	21.41	7.06	
	3.886	20.25	2.921	15.11	4.826	22.86	23.108	-7.85	12.606	-2.31	7.692	21.60	22.821	-8.33	21.340	-15.67	17.576	-14.88	15.91562 21
23	****	****	4.16	19.28	5.19	22.05	2.31	13.18	15.26	3.11	8.13	0.38	2.14	12.50	1.27	10.39	21.33	6.58	
	4.020	20.64	3.173	16.49	5.002	23.22	23.198	-7.33	12.601	-2.28	7.705	21.57	22.823	-8.31	21.340	-15.67	17.573	-14.88	16.04704 23
25	****	****	4.15	19.45	5.19	22.10	2.25	13.18	15.17	3.03	8.06	0.31	2.06	12.42	1.20	10.31	21.25	6.50	
	4.154	21.00	3.437	17.85	5.179	23.53	23.287	-6.80	12.596	-2.26	7.719	21.53	22.825	-8.30	21.340	-15.67	17.570	-14.88	16.17846 25
27	****	****	4.15	20.02	5.20	22.15	2.20	13.19	15.09	2.55	7.59	0.23	1.58	12.35	1.12	10.23	21.17	6.42	
	4.289	21.35	3.714	19.16	5.356	23.79	23.376	-6.27	12.592	-2.25	7.733	21.50	22.827	-8.29	21.339	-15.67	17.566	-14.88	16.30989 27
29	****	****	4.16	20.20	5.21	22.19	2.15	13.19	15.01	2.47	7.53	0.16	1.50	12.27	1.04	10.15	21.09	6.34	
	4.425	21.66	4.002	20.40	5.534	24.01	23.465	-5.74	12.589	-2.24	7.748	21.47	22.829	-8.28	21.339	-15.68	17.563	-14.88	16.44131 29
31	****	****	4.18	20.39	5.22	22.23	2.09	13.19	14.53	2.39	7.46	0.09	1.43	12.19	0.56	10.07	21.01	6.26	
	4.561	21.96	4.300	21.55	5.712	24.18	23.553	-5.21	12.587	-2.23	7.762	21.44	22.831	-8.27	21.338	-15.68	17.560	-14.87	16.57273 31

CZERWIEC 2005

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]									
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2453																			
152	1	Śro	523	3.54122	2.14	4.3745	22.06	1.01411	0.2239	0.53	59.438	1.9	29	426	1243.5	2102	221	821.9	1441	153	1	
153	2	Czw	524	3.58087	2.05	4.4151	22.14	1.01427	1.1004	7.09	60.007	2.9	20	425	1243.7	2103	231	906.7	1603	149	2	
154	3	Pią	525	4.02053	1.55	4.4557	22.21	1.01442	1.5756	13.01	60.571	3.9	12	424	1243.8	2104	241	951.9	1724	145	3	
155	4	Sob	526	4.06018	1.45	4.5004	22.28	1.01457	2.4709	18.13	61.123	4.9	6	423	1244.0	2105	253	1038.5	1846	142	4	
156	5	Nie	527	4.09584	1.34	4.5411	22.35	1.01471	3.3818	22.32	61.656	5.9	2	423	1244.2	2106	308	1127.3	2007	138	5	
157	6	Pon	528	4.13549	1.23	4.5818	22.41	1.01484	4.3126	25.45	62.159	6.9	0	422	1244.4	2107	330	1218.2	2124	134	6	
158	7	Wto	529	4.17515	1.12	5.0226	22.47	1.01497	5.2602	27.40	62.620	0.5	0	421	1244.5	2108	400	1310.7	2231	130	7	
159	8	Śro	530	4.21481	1.00	5.0634	22.52	1.01510	6.2106	28.13	63.018	1.5	2	421	1244.7	2109	443	1403.7	2323	126	8	
160	9	Czw	531	4.25446	0.49	5.1043	22.57	1.01521	7.1522	27.24	63.328	2.5	6	420	1244.9	2110	540	1455.7	****	122	9	
161	10	Pią	532	4.29412	0.37	5.1451	23.02	1.01533	8.0743	25.20	63.523	3.5	11	420	1245.1	2111	648	1545.4	000	118	10	
162	11	Sob	533	4.33378	0.24	5.1860	23.06	1.01543	8.5734	22.11	63.576	4.5	18	420	1245.3	2111	801	1632.4	025	114	11	
163	12	Nie	534	4.37343	0.12	5.2309	23.10	1.01554	9.4454	18.08	63.464	5.5	26	419	1245.5	2112	917	1716.6	043	110	12	
164	13	Pon	535	4.41309	-0.01	5.2718	23.14	1.01563	10.3006	13.22	63.173	6.5	34	419	1245.8	2113	1031	1758.6	057	106	13	
165	14	Wto	536	4.45274	-0.13	5.3127	23.17	1.01572	11.1357	8.03	62.697	7.5	44	419	1246.0	2113	1145	1839.5	107	102	14	
166	15	Śro	537	4.49240	-0.26	5.3536	23.19	1.01581	11.5724	2.22	62.046	0.4	54	419	1246.2	2114	1259	1920.2	116	058	15	
167	16	Czw	538	4.53205	-0.39	5.3946	23.22	1.01589	12.4131	-3.33	61.247	1.4	63	419	1246.4	2114	1415	2002.0	125	054	16	
168	17	Pią	539	4.57171	-0.52	5.4355	23.23	1.01597	13.2732	-9.29	60.341	2.4	73	419	1246.6	2115	1534	2046.4	134	050	17	
169	18	Sob	540	5.01136	-1.05	5.4805	23.25	1.01605	14.1643	-15.13	59.388	3.4	82	419	1246.8	2115	1658	2134.7	144	046	18	
170	19	Nie	541	5.05102	-1.18	5.5214	23.26	1.01612	15.1018	-20.24	58.459	4.4	90	419	1247.0	2116	1828	2228.4	158	043	19	
171	20	Pon	542	5.09068	-1.31	5.5624	23.26	1.01619	16.0905	-24.36	57.629	5.4	96	419	1247.3	2116	2000	2328.0	218	039	20	
172	21	Wto	543	5.13033	-1.44	6.0033	23.26	1.01625	17.1254	-27.21	56.973	6.4	99	419	1247.5	2116	2126	*****	248	035	21	
173	22	Śro	544	5.16599	-1.57	6.0443	23.26	1.01631	18.2008	-28.12	56.550	0.2	100	419	1247.7	2116	2233	032.7	337	031	22	
174	23	Czw	545	5.20565	-2.09	6.0852	23.26	1.01637	19.2750	-26.59	56.392	1.2	98	419	1247.9	2116	2317	139.6	450	027	23	
175	24	Pią	546	5.24530	-2.22	6.1302	23.24	1.01643	20.3257	-23.49	56.504	2.2	93	420	1248.1	2116	2346	245.0	621	023	24	
176	25	Sob	547	5.28496	-2.35	6.1711	23.23	1.01648	21.3341	-19.06	56.861	3.2	85	420	1248.3	2116	****	346.0	759	019	25	
177	26	Nie	548	5.32461	-2.48	6.2120	23.21	1.01653	22.2940	-13.19	57.412	4.2	76	421	1248.5	2116	004	441.6	934	015	26	
178	27	Pon	549	5.36427	-2.60	6.2529	23.19	1.01657	23.2143	-6.57	58.098	5.2	65	421	1248.7	2116	018	532.4	1103	011	27	
179	28	Wto	550	5.40392	-3.12	6.2938	23.16	1.01661	0.1102	-0.25	58.857	6.2	54	422	1249.0	2116	029	619.9	1229	007	28	
180	29	Śro	551	5.44358	-3.24	6.3347	23.13	1.01664	0.5859	5.57	59.634	0.6	43	422	1249.2	2116	039	705.5	1351	003	29	
181	30	Czw	552	5.48323	-3.36	6.3755	23.09	1.01667	1.4646	11.55	60.387	1.6	33	423	1249.4	2115	049	750.6	1513	2355	30	

Fazy Księżyca [Dm, h.mm]: Now 6, 23.55 1kw 15, 3.22 Pełn 22, 6.14 3kw 28, 20.23

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Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	
Dm	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT) Dm	
1	*****	*****	4.19	20.48	5.23	22.25	2.06	13.19	14.49	2.35	7.42	0.05	1.39	12.15	0.52	10.03	20.57	6.22		
	4.629	22.10	4.453	22.08	5.802	24.25	23.597	-4.94	12.586	-2.23	7.770	21.42	22.832	-8.27	21.338	-15.68	17.558	-14.87	16.63844	1
3	*****	*****	4.22	21.06	5.25	22.29	2.01	13.19	14.41	2.27	7.36	23.54	1.31	12.08	0.44	9.55	20.49	6.14		
	4.766	22.35	4.763	23.04	5.981	24.35	23.684	-4.41	12.585	-2.23	7.785	21.38	22.833	-8.26	21.337	-15.69	17.554	-14.87	16.76986	3
5	*****	*****	4.27	21.23	5.27	22.32	1.55	13.20	14.33	2.19	7.29	23.47	1.23	11.60	0.36	9.47	20.41	6.06		
	4.903	22.58	5.079	23.83	6.160	24.40	23.772	-3.88	12.584	-2.24	7.800	21.35	22.834	-8.26	21.336	-15.69	17.551	-14.87	16.90128	5
7	*****	*****	4.33	21.39	5.30	22.35	1.50	13.20	14.25	2.11	7.22	23.40	1.15	11.52	0.28	9.39	20.33	5.58		
	5.041	22.78	5.395	24.46	6.339	24.40	23.859	-3.34	12.584	-2.25	7.816	21.31	22.835	-8.25	21.334	-15.70	17.547	-14.87	17.03270	7
9	*****	*****	4.41	21.54	5.33	22.38	1.44	13.20	14.18	2.03	7.16	23.32	1.07	11.44	0.20	9.31	20.25	5.50		
	5.178	22.96	5.710	24.89	6.518	24.36	23.945	-2.81	12.585	-2.26	7.831	21.27	22.835	-8.25	21.333	-15.71	17.544	-14.87	17.16413	9
11	*****	*****	4.49	22.07	5.37	22.40	1.39	13.20	14.10	1.55	7.09	23.25	0.59	11.36	0.13	9.23	20.17	5.42		
	5.317	23.11	6.019	25.15	6.696	24.27	0.031	-2.28	12.587	-2.28	7.847	21.23	22.836	-8.25	21.332	-15.71	17.540	-14.87	17.29555	11
13	*****	*****	4.59	22.17	5.41	22.41	1.33	13.20	14.03	1.48	7.03	23.18	0.52	11.29	0.05	9.15	20.09	5.34		
	5.455	23.23	6.321	25.22	6.874	24.13	0.117	-1.76	12.589	-2.31	7.863	21.19	22.836	-8.25	21.330	-15.72	17.537	-14.87	17.42697	13
15	*****	*****	5.09	22.26	5.45	22.43	1.28	13.20	13.55	1.40	6.56	23.11	0.44	11.21	23.53	9.07	20.00	5.25		
	5.593	23.32	6.613	25.12	7.052	23.94	0.203	-1.23	12.592	-2.34	7.880	21.15	22.836	-8.25	21.328	-15.73	17.533	-14.87	17.55839	15
17	*****	*****	5.20	22.33	5.50	22.43	1.22	13.20	13.48	1.32	6.49	23.04	0.36	11.13	23.45	8.59	19.52	5.17		
	5.732	23.39	6.893	24.87	7.229	23.71	0.288	-0.71	12.596	-2.37	7.896	21.11	22.836	-8.25	21.327	-15.74	17.529	-14.87	17.68981	17
19	*****	*****	5.31	22.38	5.55	22.44	1.17	13.20	13.40	1.24	6.43	22.56	0.28	11.05	23.37	8.51	19.44	5.09		
	5.871	23.43	7.160	24.48	7.405	23.43	0.373	-0.19	12.601	-2.41	7.913	21.06	22.836	-8.26	21.325	-15.75	17.526	-14.88	17.82123	19
21	*****	*****	5.43	22.41	5.60	22.44	1.11	13.20	13.33	1.16	6.36	22.49	0.20	10.57	23.29	8.43	19.36	5.01		
	6.009	23.44	7.414	23.97	7.580	23.11	0.457	0.33	12.606	-2.45	7.930	21.02	22.835	-8.26	21.323	-15.76	17.522	-14.88	17.95265	21
23	*****	*****	5.54	22.42	6.05	22.44	1.06	13.20	13.26	1.09	6.30	22.42	0.12	10.49	23.21	8.35	19.28	4.53		
	6.148	23.43	7.654	23.35	7.754	22.74	0.541	0.84	12.612	-2.50	7.947	20.98	22.835	-8.27	21.320	-15.77	17.519	-14.88	18.08408	23
25	*****	*****	6.05	22.43	6.11	22.43	0.60	13.20	13.18	1.01	6.23	22.35	0.04	10.41	23.13	8.27	19.20	4.45		
	6.286	23.38	7.880	22.64	7.927	22.33	0.625	1.35	12.619	-2.55	7.964	20.93	22.834	-8.27	21.318	-15.78	17.515	-14.88	18.21550	25
27	*****	*****	6.16	22.42	6.17	22.42	0.54	13.20	13.11	0.53	6.17	22.28	23.53	10.33	23.05	8.19	19.12	4.37		
	6.425	23.31	8.091	21.87	8.099	21.87	0.708	1.86	12.626	-2.61	7.981	20.89	22.833	-8.28	21.316	-15.79	17.512	-14.88	18.34692	27
29	*****	*****	6.26	22.39	6.23	22.41	0.49	13.20	13.04	0.45	6.10	22.21	23.45	10.25	22.57	8.11	19.04	4.29		
	6.563	23.21	8.289	21.03	8.269	21.38	0.791	2.36	12.634	-2.67	7.998	20.84	22.831	-8.29	21.313	-15.80	17.508	-14.89	18.47834	29

LIPIEC 2005

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2453																			
182	1	Pią	553	5.52289	-3.48	6.4203	23.05	1.01670	2.3527	17.15	61.085	2.6	23	424	1249.5	2115	100	836.6	1635	2351	1	
183	2	Sob	554	5.56255	-3.59	6.4611	23.01	1.01672	3.2546	21.43	61.713	3.6	15	424	1249.7	2115	115	924.3	1755	2348	2	
184	3	Nie	555	6.00220	-4.11	6.5019	22.56	1.01673	4.1758	25.09	62.262	4.6	9	425	1249.9	2114	134	1014.0	1913	2344	3	
185	4	Pon	556	6.04186	-4.22	6.5427	22.51	1.01674	5.1150	27.20	62.729	5.6	4	426	1250.1	2114	201	1105.7	2023	2340	4	
186	5	Wto	557	6.08152	-4.32	6.5834	22.46	1.01674	6.0632	28.12	63.112	6.6	1	427	1250.3	2113	239	1158.2	2119	2336	5	
187	6	Śro	558	6.12117	-4.42	7.0241	22.40	1.01674	7.0051	27.42	63.408	7.6	0	428	1250.5	2113	331	1250.4	2200	2332	6	
188	7	Czw	559	6.16083	-4.52	7.0647	22.33	1.01673	7.5339	25.55	63.609	0.9	1	429	1250.6	2112	436	1340.9	2229	2328	7	
189	8	Pią	560	6.20048	-5.02	7.1053	22.26	1.01671	8.4407	23.00	63.705	1.9	3	430	1250.8	2111	549	1428.7	2249	2324	8	
190	9	Sob	561	6.24014	-5.11	7.1459	22.19	1.01669	9.3200	19.09	63.682	2.9	8	431	1250.9	2110	704	1513.7	2303	2320	9	
191	10	Nie	562	6.27580	-5.19	7.1904	22.12	1.01666	10.1733	14.32	63.523	3.9	13	432	1251.1	2110	819	1556.2	2315	2316	10	
192	11	Pon	563	6.31545	-5.28	7.2309	22.04	1.01663	11.0122	9.23	63.215	4.9	20	433	1251.2	2109	932	1637.0	2324	2312	11	
193	12	Wto	564	6.35511	-5.35	7.2713	21.56	1.01659	11.4417	3.50	62.749	5.9	29	434	1251.3	2108	1045	1717.0	2332	2308	12	
194	13	Śro	565	6.39476	-5.43	7.3117	21.47	1.01654	12.2720	-1.56	62.124	6.9	38	435	1251.5	2107	1158	1757.4	2341	2304	13	
195	14	Czw	566	6.43442	-5.49	7.3520	21.38	1.01649	13.1137	-7.46	61.353	7.9	48	437	1251.6	2106	1314	1839.5	2350	2300	14	
196	15	Pią	567	6.47407	-5.56	7.3923	21.29	1.01644	13.5823	-13.26	60.464	0.8	58	438	1251.7	2105	1434	1924.7	****	2256	15	
197	16	Sob	568	6.51373	-6.01	7.4325	21.19	1.01638	14.4854	-18.42	59.502	1.8	68	439	1251.8	2104	1559	2014.4	002	2252	16	
198	17	Nie	569	6.55338	-6.07	7.4727	21.09	1.01632	15.4416	-23.12	58.527	2.8	78	440	1251.9	2102	1729	2109.8	018	2249	17	
199	18	Pon	570	6.59304	-6.11	7.5128	20.58	1.01625	16.4458	-26.30	57.616	3.8	87	442	1251.9	2101	1857	2211.1	042	2245	18	
200	19	Wto	571	7.03270	-6.15	7.5529	20.48	1.01618	17.5020	-28.09	56.848	4.8	94	443	1252.0	2100	2013	2316.8	120	2241	19	
201	20	Śro	572	7.07235	-6.19	7.5929	20.36	1.01611	18.5808	-27.48	56.298	5.8	98	445	1252.1	2059	2109	*****	221	2237	20	
202	21	Czw	573	7.11201	-6.22	8.0328	20.25	1.01603	20.0516	-25.21	56.024	6.8	100	446	1252.1	2057	2144	023.7	345	2233	21	
203	22	Pią	574	7.15167	-6.24	8.0727	20.13	1.01595	21.0907	-21.05	56.051	1.0	99	447	1252.1	2056	2207	128.1	523	2229	22	
204	23	Sob	575	7.19132	-6.26	8.1125	20.01	1.01587	22.0827	-15.28	56.375	2.0	94	449	1252.2	2054	2223	227.8	703	2225	23	
205	24	Nie	576	7.23098	-6.27	8.1523	19.48	1.01578	23.0329	-9.02	56.953	3.0	87	450	1252.2	2053	2235	322.4	838	2221	24	
206	25	Pon	577	7.27063	-6.28	8.1920	19.35	1.01569	23.5511	-2.17	57.723	4.0	78	452	1252.2	2052	2246	412.9	1009	2217	25	
207	26	Wto	578	7.31029	-6.28	8.2317	19.22	1.01560	0.4451	4.23	58.609	5.0	68	453	1252.2	2050	2256	500.7	1135	2213	26	
208	27	Śro	579	7.34594	-6.27	8.2713	19.09	1.01550	1.3346	10.38	59.536	6.0	58	455	1252.2	2048	2307	547.2	1259	2209	27	
209	28	Czw	580	7.38560	-6.26	8.3109	18.55	1.01540	2.2301	16.14	60.440	0.3	47	456	1252.2	2047	2320	633.8	1422	2205	28	
210	29	Pią	581	7.42525	-6.25	8.3503	18.41	1.01529	3.1327	20.58	61.271	1.3	37	458	1252.2	2045	2338	721.5	1544	2201	29	
211	30	Sob	582	7.46491	-6.22	8.3858	18.26	1.01518	4.0528	24.38	61.996	2.3	27	500	1252.1	2044	****	810.9	1704	2157	30	
212	31	Nie	583	7.50457	-6.19	8.4251	18.12	1.01507	4.5900	27.06	62.597	3.3	19	501	1252.1	2042	002	902.1	1816	2153	31	

Fazy Księżyca [Dm, h.mm]: Nów 6, 14.02 1kw 14, 17.20 Pełn 21, 13.00 3kw 28, 5.19

LIPIEC 2005 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	*****	*****	6.36	22.36	6.29	22.39	0.43	13.19	12.57	0.38	6.04	22.13	23.37	10.17	22.49	8.03	18.56	4.21		
	6.701	23.09	8.472	20.15	8.438	20.84	0.873	2.86	12.642	-2.73	8.016	20.79	22.830	-8.30	21.311	-15.82	17.505	-14.89	18.60976	1
3	*****	*****	6.44	22.32	6.35	22.37	0.38	13.19	12.50	0.30	5.57	22.06	23.29	10.09	22.41	7.55	18.48	4.13		
	6.839	22.94	8.642	19.23	8.606	20.27	0.955	3.35	12.652	-2.80	8.033	20.75	22.828	-8.31	21.308	-15.83	17.501	-14.89	18.74118	3
5	*****	*****	6.52	22.27	6.41	22.35	0.32	13.19	12.43	0.22	5.51	21.59	23.21	10.01	22.33	7.47	18.40	4.05		
	6.976	22.76	8.796	18.30	8.773	19.66	1.037	3.83	12.662	-2.87	8.051	20.70	22.826	-8.32	21.305	-15.84	17.498	-14.90	18.87260	5
7	*****	*****	6.59	22.22	6.48	22.33	0.26	13.18	12.37	0.15	5.44	21.52	23.13	9.53	22.25	7.39	18.32	3.57		
	7.113	22.55	8.936	17.37	8.938	19.02	1.118	4.31	12.672	-2.95	8.069	20.65	22.824	-8.34	21.302	-15.86	17.495	-14.90	19.00403	7
9	*****	*****	7.04	22.15	6.54	22.30	0.21	13.18	12.30	0.07	5.38	21.45	23.05	9.45	22.18	7.30	18.24	3.48		
	7.250	22.32	9.061	16.44	9.101	18.34	1.198	4.79	12.683	-3.02	8.087	20.60	22.822	-8.35	21.299	-15.87	17.492	-14.91	19.13545	9
11	*****	*****	7.08	22.08	7.01	22.27	0.15	13.17	12.23	23.56	5.31	21.38	22.57	9.37	22.10	7.22	18.16	3.40		
	7.386	22.07	9.170	15.54	9.263	17.62	1.278	5.25	12.695	-3.11	8.104	20.55	22.820	-8.37	21.296	-15.88	17.488	-14.91	19.26687	11
13	*****	*****	7.11	22.01	7.07	22.24	0.10	13.16	12.16	23.48	5.25	21.31	22.49	9.29	22.02	7.14	18.08	3.32		
	7.521	21.78	9.262	14.67	9.424	16.88	1.358	5.71	12.707	-3.19	8.122	20.50	22.817	-8.39	21.293	-15.90	17.485	-14.92	19.39829	13
15	*****	*****	7.13	21.52	7.14	22.21	0.04	13.16	12.10	23.40	5.19	21.23	22.41	9.21	21.54	7.06	17.60	3.24		
	7.656	21.48	9.338	13.85	9.583	16.11	1.436	6.17	12.720	-3.28	8.140	20.44	22.814	-8.40	21.290	-15.91	17.482	-14.92	19.52971	15
17	*****	*****	7.13	21.43	7.20	22.17	23.54	13.15	12.03	23.33	5.12	21.16	22.33	9.12	21.46	6.58	17.52	3.16		
	7.791	21.15	9.395	13.10	9.741	15.31	1.515	6.61	12.734	-3.38	8.158	20.39	22.811	-8.42	21.287	-15.93	17.479	-14.93	19.66113	17
19	*****	*****	7.11	21.34	7.27	22.14	23.49	13.14	11.57	23.25	5.06	21.09	22.26	9.04	21.38	6.50	17.44	3.08		
	7.925	20.79	9.433	12.43	9.897	14.48	1.592	7.05	12.748	-3.48	8.176	20.34	22.808	-8.44	21.284	-15.94	17.477	-14.94	19.79255	19
21	*****	*****	7.08	21.24	7.34	22.10	23.43	13.13	11.50	23.18	4.59	21.02	22.18	8.56	21.30	6.42	17.36	2.60		
	8.058	20.41	9.452	11.85	10.052	13.63	1.669	7.48	12.762	-3.58	8.194	20.29	22.805	-8.46	21.280	-15.96	17.474	-14.94	19.92398	21
23	*****	*****	7.03	21.13	7.40	22.06	23.38	13.12	11.44	23.10	4.53	20.55	22.10	8.48	21.22	6.33	17.28	2.52		
	8.190	20.01	9.450	11.39	10.206	12.76	1.746	7.90	12.777	-3.68	8.212	20.23	22.802	-8.48	21.277	-15.98	17.471	-14.95	20.05540	23
25	*****	*****	6.55	21.02	7.47	22.02	23.32	13.11	11.37	23.03	4.47	20.48	22.02	8.40	21.14	6.25	17.20	2.44		
	8.322	19.59	9.427	11.06	10.358	11.86	1.821	8.32	12.793	-3.79	8.230	20.18	22.798	-8.51	21.273	-15.99	17.469	-14.96	20.18682	25
27	*****	*****	6.46	20.50	7.53	21.58	23.26	13.10	11.31	22.55	4.40	20.40	21.54	8.32	21.06	6.17	17.12	2.36		
	8.454	19.15	9.384	10.88	10.509	10.95	1.896	8.72	12.809	-3.89	8.248	20.13	22.795	-8.53	21.270	-16.01	17.466	-14.96	20.31823	27
29	1.13	0.05	6.35	20.39	7.59	21.54	23.21	13.09	11.25	22.48	4.34	20.33	21.46	8.23	20.58	6.09	17.04	2.28		
	8.584	18.68	9.322	10.84	10.659	10.01	1.970	9.12	12.825	-4.01	8.266	20.07	22.791	-8.55	21.266	-16.02	17.464	-14.97	20.44965	29
31	1.36	-0.07	6.21	20.27	8.06	21.50	23.15	13.08	11.19	22.40	4.27	20.26	21.38	8.15	20.50	6.01	16.56	2.20		
	8.714	18.19	9.243	10.97	10.808	9.06	2.043	9.50	12.843	-4.12	8.284	20.02	22.787	-8.58	21.263	-16.04	17.461	-14.98	20.58108	31

SIERPIEŃ 2005

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)											Czas strefowy [hhmm.]							
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
2453																					
213	1	Pon	584	7.54422	-6.16	8.4645	17.57	1.01495	5.5326	28.14	63.068	4.3	12	503	1252.0	2040	037	954.4	1916	2150	1
214	2	Wto	585	7.58388	-6.12	8.5037	17.41	1.01482	6.4744	28.01	63.411	5.3	7	504	1251.9	2038	125	1046.6	2002	2146	2
215	3	Śro	586	8.02353	-6.07	8.5429	17.26	1.01469	7.4047	26.30	63.633	6.3	3	506	1251.9	2037	227	1137.4	2034	2142	3
216	4	Czw	587	8.06319	-6.02	8.5820	17.10	1.01455	8.3145	23.48	63.740	7.3	0	508	1251.8	2035	337	1226.2	2056	2138	4
217	5	Pią	588	8.10285	-5.56	9.0211	16.53	1.01441	9.2013	20.07	63.740	0.3	0	509	1251.7	2033	452	1311.9	2111	2134	5
218	6	Sob	589	8.14250	-5.50	9.0601	16.37	1.01426	10.0617	15.38	63.632	1.3	1	511	1251.6	2031	608	1355.2	2123	2130	6
219	7	Nie	590	8.18216	-5.43	9.0951	16.20	1.01411	10.5027	10.33	63.416	2.3	5	513	1251.5	2029	722	1436.4	2132	2126	7
220	8	Pon	591	8.22181	-5.35	9.1340	16.03	1.01395	11.3325	5.04	63.087	3.3	10	514	1251.3	2027	835	1516.4	2141	2122	8
221	9	Wto	592	8.26147	-5.27	9.1728	15.46	1.01379	12.1606	-0.40	62.638	4.3	16	516	1251.2	2025	948	1556.3	2149	2118	9
222	10	Śro	593	8.30112	-5.18	9.2116	15.29	1.01362	12.5929	-6.27	62.067	5.3	24	518	1251.1	2023	1102	1637.1	2158	2114	10
223	11	Czw	594	8.34078	-5.09	9.2503	15.11	1.01345	13.4442	-12.07	61.378	6.3	33	519	1250.9	2021	1219	1720.1	2208	2110	11
224	12	Pią	595	8.38043	-4.59	9.2850	14.53	1.01327	14.3254	-17.24	60.583	7.3	43	521	1250.7	2019	1340	1806.7	2221	2106	12
225	13	Sob	596	8.42009	-4.48	9.3236	14.35	1.01309	15.2511	-22.03	59.711	0.3	53	523	1250.6	2017	1506	1858.1	2241	2102	13
226	14	Nie	597	8.45574	-4.37	9.3621	14.16	1.01290	16.2219	-25.41	58.804	1.3	64	525	1250.4	2015	1633	1955.0	2311	2058	14
227	15	Pon	598	8.49540	-4.25	9.4006	13.57	1.01272	17.2414	-27.54	57.922	2.3	75	526	1250.2	2013	1753	2057.0	****	2054	15
228	16	Wto	599	8.53506	-4.13	9.4350	13.39	1.01252	18.2939	-28.20	57.134	3.3	84	528	1250.0	2011	1857	2202.0	000	2051	16
229	17	Śro	600	8.57471	-4.01	9.4734	13.19	1.01233	19.3605	-26.45	56.516	4.3	92	530	1249.8	2009	1940	2306.9	111	2047	17
230	18	Czw	601	9.01437	-3.47	9.5117	13.00	1.01214	20.4054	-23.14	56.136	5.3	97	531	1249.5	2007	2008	*****	242	2043	18
231	19	Pią	602	9.05402	-3.33	9.5500	12.41	1.01194	21.4217	-18.06	56.040	6.3	100	533	1249.3	2004	2027	008.8	422	2039	19
232	20	Sob	603	9.09368	-3.19	9.5842	12.21	1.01174	22.3943	-11.50	56.246	0.7	99	535	1249.1	2002	2041	106.3	601	2035	20
233	21	Nie	604	9.13333	-3.04	10.0224	12.01	1.01154	23.3345	-4.59	56.737	1.7	96	536	1248.8	2000	2052	159.7	737	2031	21
234	22	Pon	605	9.17299	-2.49	10.0606	11.41	1.01133	0.2527	1.59	57.462	2.7	90	538	1248.6	1958	2102	249.9	907	2027	22
235	23	Wto	606	9.21264	-2.34	10.0946	11.21	1.01112	1.1602	8.40	58.351	3.7	82	540	1248.3	1956	2113	338.4	1036	2023	23
236	24	Śro	607	9.25230	-2.18	10.1327	11.00	1.01092	2.0635	14.43	59.323	4.7	73	542	1248.0	1953	2125	426.5	1202	2019	24
237	25	Czw	608	9.29195	-2.01	10.1707	10.39	1.01070	2.5759	19.52	60.300	5.7	63	543	1247.8	1951	2141	515.2	1328	2015	25
238	26	Pią	609	9.33161	-1.44	10.2047	10.19	1.01049	3.5041	23.57	61.213	6.7	52	545	1247.5	1949	2203	605.3	1451	2011	26
239	27	Sob	610	9.37127	-1.27	10.2426	9.58	1.01027	4.4442	26.46	62.014	0.8	42	547	1247.2	1946	2234	656.9	1607	2007	27
240	28	Nie	611	9.41092	-1.10	10.2805	9.36	1.01006	5.3930	28.15	62.669	1.8	33	548	1246.9	1944	2318	749.5	1713	2003	28
241	29	Pon	612	9.45058	-0.52	10.3144	9.15	1.00983	6.3411	28.21	63.161	2.8	24	550	1246.6	1942	****	842.2	1803	1959	29
242	30	Wto	613	9.49023	-0.33	10.3522	8.54	1.00961	7.2740	27.07	63.487	3.8	16	552	1246.3	1940	016	933.7	1838	1956	30
243	31	Śro	614	9.52589	-0.15	10.3900	8.32	1.00938	8.1909	24.41	63.656	4.8	10	554	1246.0	1937	125	1023.1	1902	1952	31

Fazy Księżyca [Dm, h.mm]: Nów 5, 5.05 1kw 13, 4.38 Pełn 19, 19.53 3kw 26, 17.18

SIERPIEŃ 2005 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST (0^h UT) Dm	
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach		
1	1.44	23.55	6.14	20.21	8.09	21.47	23.12	13.07	11.16	22.37	4.24	20.22	21.34	8.11	20.46	5.57	16.52	2.16		
	8.779	17.94	9.199	11.09	10.882	8.58	2.079	9.69	12.851	-4.18	8.293	19.99	22.785	-8.59	21.261	-16.05	17.460	-14.98	20.64679	1
3	1.57	23.42	5.59	20.09	8.15	21.43	23.06	13.05	11.09	22.29	4.18	20.15	21.26	8.03	20.38	5.48	16.44	2.08		
	8.908	17.43	9.104	11.45	11.029	7.61	2.151	10.07	12.869	-4.30	8.310	19.94	22.781	-8.62	21.257	-16.07	17.458	-14.99	20.77821	3
5	2.08	23.31	5.42	19.58	8.22	21.38	23.01	13.04	11.03	22.22	4.11	20.08	21.18	7.54	20.30	5.40	16.36	1.60		
	9.036	16.89	9.005	11.93	11.176	6.63	2.222	10.43	12.887	-4.42	8.328	19.88	22.777	-8.64	21.254	-16.08	17.456	-15.00	20.90963	5
7	2.18	23.21	5.25	19.48	8.28	21.34	22.55	13.02	10.57	22.14	4.05	20.01	21.10	7.46	20.22	5.32	16.28	1.52		
	9.164	16.34	8.909	12.51	11.322	5.63	2.291	10.79	12.906	-4.54	8.346	19.82	22.772	-8.67	21.250	-16.10	17.454	-15.01	21.04105	7
9	2.27	23.12	5.08	19.39	8.34	21.29	22.49	13.00	10.51	22.07	3.58	19.54	21.02	7.38	20.14	5.24	16.20	1.44		
	9.291	15.77	8.823	13.16	11.467	4.62	2.359	11.13	12.925	-4.67	8.363	19.77	22.768	-8.70	21.247	-16.12	17.453	-15.02	21.17247	9
11	2.36	23.03	4.52	19.31	8.40	21.25	22.44	12.58	10.45	21.60	3.52	19.47	20.54	7.30	20.06	5.16	16.12	1.36		
	9.417	15.18	8.754	13.83	11.611	3.61	2.427	11.46	12.944	-4.80	8.381	19.71	22.763	-8.72	21.243	-16.13	17.451	-15.03	21.30388	11
13	2.44	22.55	4.37	19.25	8.47	21.20	22.38	12.56	10.39	21.52	3.46	19.39	20.46	7.21	19.58	5.08	16.04	1.28		
	9.543	14.58	8.709	14.50	11.755	2.59	2.492	11.79	12.964	-4.93	8.398	19.66	22.759	-8.75	21.239	-16.15	17.450	-15.04	21.43530	13
15	2.51	22.47	4.25	19.19	8.53	21.15	22.32	12.54	10.33	21.45	3.39	19.32	20.38	7.13	19.50	4.59	15.57	1.19		
	9.668	13.96	8.692	15.12	11.898	1.56	2.557	12.10	12.985	-5.06	8.416	19.60	22.754	-8.78	21.236	-16.17	17.448	-15.05	21.56673	15
17	2.58	22.39	4.15	19.16	8.59	21.10	22.26	12.52	10.27	21.37	3.33	19.25	20.30	7.05	19.42	4.51	15.49	1.11		
	9.793	13.32	8.706	15.65	12.041	0.53	2.620	12.40	13.005	-5.20	8.433	19.55	22.749	-8.81	21.232	-16.18	17.447	-15.06	21.69815	17
19	3.05	22.31	4.07	19.13	9.05	21.05	22.20	12.49	10.21	21.30	3.26	19.18	20.22	6.56	19.34	4.43	15.41	1.04		
	9.917	12.68	8.754	16.07	12.183	-0.50	2.682	12.70	13.026	-5.33	8.450	19.49	22.745	-8.84	21.229	-16.20	17.446	-15.07	21.82957	19
21	3.12	22.24	4.02	19.12	9.11	21.01	22.14	12.47	10.16	21.23	3.20	19.10	20.14	6.48	19.26	4.35	15.33	0.56		
	10.040	12.02	8.836	16.35	12.325	-1.53	2.742	12.98	13.048	-5.47	8.467	19.44	22.740	-8.87	21.225	-16.21	17.445	-15.08	21.96099	21
23	3.18	22.17	4.00	19.12	9.17	20.56	22.08	12.44	10.10	21.15	3.13	19.03	20.06	6.40	19.18	4.27	15.25	0.48		
	10.163	11.34	8.949	16.46	12.467	-2.56	2.800	13.25	13.070	-5.61	8.483	19.38	22.735	-8.90	21.222	-16.23	17.444	-15.09	22.09240	23
25	3.24	22.10	4.02	19.12	9.24	20.51	22.02	12.41	10.04	21.08	3.07	18.56	19.58	6.31	19.10	4.18	15.17	0.40		
	10.285	10.66	9.094	16.40	12.609	-3.59	2.857	13.51	13.092	-5.75	8.500	19.33	22.730	-8.93	21.218	-16.25	17.443	-15.10	22.22382	25
27	3.30	22.03	4.06	19.13	9.30	20.46	21.56	12.38	9.58	21.01	3.00	18.49	19.50	6.23	19.02	4.10	15.09	0.32		
	10.407	9.96	9.265	16.13	12.751	-4.62	2.911	13.77	13.114	-5.89	8.516	19.27	22.725	-8.96	21.215	-16.26	17.443	-15.11	22.35524	27
29	3.36	21.56	4.12	19.14	9.36	20.41	21.50	12.35	9.53	20.54	2.54	18.41	19.42	6.15	18.54	4.02	15.02	0.24		
	10.529	9.25	9.460	15.67	12.893	-5.64	2.964	14.01	13.137	-6.04	8.533	19.22	22.720	-8.99	21.212	-16.28	17.443	-15.13	22.48666	29
31	3.41	21.50	4.21	19.15	9.42	20.36	21.44	12.31	9.47	20.46	2.47	18.34	19.34	6.06	18.46	3.54	14.54	0.16		
	10.650	8.53	9.674	15.00	13.036	-6.65	3.015	14.24	13.160	-6.19	8.549	19.16	22.715	-9.02	21.208	-16.29	17.442	-15.14	22.61808	31

WRZESIEŃ 2005

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)											Czas strefowy [hhmm.]							
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2453																		
244	1	Czw	615	9.56554	0.04	10.4238	8.10	1.00914	9.0812	21.11	63.682	5.8	5	555	1245.7	1935	240	1109.8	1919	1948	1
245	2	Pią	616	10.00520	0.23	10.4615	7.48	1.00890	9.5452	16.51	63.584	6.8	2	557	1245.4	1933	355	1153.8	1932	1944	2
246	3	Sob	617	10.04486	0.42	10.4952	7.26	1.00866	10.3933	11.51	63.379	7.8	0	559	1245.0	1930	510	1235.8	1942	1940	3
247	4	Nie	618	10.08451	1.02	10.5329	7.04	1.00842	11.2255	6.23	63.082	0.6	0	600	1244.7	1928	624	1316.2	1950	1936	4
248	5	Pon	619	10.12416	1.22	10.5706	6.42	1.00817	12.0546	0.38	62.705	1.6	2	602	1244.4	1925	738	1356.2	1958	1932	5
249	6	Wto	620	10.16382	1.42	11.0042	6.20	1.00792	12.4903	-5.13	62.253	2.6	6	604	1244.0	1923	852	1436.8	2007	1928	6
250	7	Śro	621	10.20347	2.02	11.0419	5.57	1.00766	13.3346	-10.57	61.729	3.6	12	606	1243.7	1921	1008	1519.0	2016	1924	7
251	8	Czw	622	10.24313	2.23	11.0755	5.35	1.00740	14.2057	-16.21	61.137	4.6	20	607	1243.4	1918	1128	1604.1	2028	1920	8
252	9	Pią	623	10.28279	2.44	11.1130	5.12	1.00714	15.1135	-21.08	60.481	5.6	28	609	1243.0	1916	1251	1653.1	2045	1916	9
253	10	Sob	624	10.32244	3.05	11.1506	4.49	1.00687	16.0623	-25.00	59.774	6.6	38	611	1242.7	1913	1416	1746.9	2110	1912	10
254	11	Nie	625	10.36210	3.26	11.1842	4.27	1.00660	17.0529	-27.35	59.037	7.6	49	612	1242.3	1911	1538	1845.4	2149	1908	11
255	12	Pon	626	10.40175	3.47	11.2217	4.04	1.00633	18.0804	-28.33	58.307	0.9	60	614	1242.0	1909	1647	1947.3	2249	1904	12
256	13	Wto	627	10.44141	4.08	11.2552	3.41	1.00606	19.1217	-27.41	57.632	1.9	71	616	1241.6	1906	1737	2050.2	****	1900	13
257	14	Śro	628	10.48106	4.29	11.2928	3.18	1.00579	20.1554	-24.56	57.069	2.9	81	618	1241.3	1904	1809	2151.6	010	1857	14
258	15	Czw	629	10.52072	4.51	11.3303	2.55	1.00551	21.1704	-20.29	56.678	3.9	90	619	1240.9	1901	1831	2249.7	145	1853	15
259	16	Pią	630	10.56038	5.12	11.3638	2.32	1.00524	22.1460	-14.43	56.510	4.9	96	621	1240.5	1859	1846	2344.2	323	1849	16
260	17	Sob	631	11.00003	5.34	11.4013	2.08	1.00497	23.0953	-8.05	56.600	5.9	99	623	1240.2	1857	1858	*****	459	1845	17
261	18	Nie	632	11.03568	5.55	11.4348	1.45	1.00469	0.0234	-1.04	56.953	0.3	100	624	1239.8	1854	1908	035.7	632	1841	18
262	19	Pon	633	11.07534	6.17	11.4723	1.22	1.00442	0.5406	5.54	57.546	1.3	98	626	1239.5	1852	1919	125.3	803	1837	19
263	20	Wto	634	11.11499	6.38	11.5058	0.59	1.00414	1.4536	12.24	58.328	2.3	93	628	1239.1	1849	1930	214.4	932	1833	20
264	21	Śro	635	11.15465	6.60	11.5433	0.35	1.00387	2.3754	18.07	59.231	3.3	86	630	1238.8	1847	1945	304.0	1101	1829	21
265	22	Czw	636	11.19430	7.21	11.5809	0.12	1.00359	3.3132	22.45	60.176	4.3	78	631	1238.4	1844	2004	354.9	1228	1825	22
266	23	Pią	637	11.23396	7.42	12.0144	-0.11	1.00332	4.2631	26.06	61.091	5.3	68	633	1238.0	1842	2032	447.4	1350	1821	23
267	24	Sob	638	11.27362	8.03	12.0520	-0.35	1.00304	5.2221	28.04	61.913	6.3	58	635	1237.7	1840	2111	541.1	1503	1817	24
268	25	Nie	639	11.31327	8.24	12.0856	-0.58	1.00277	6.1802	28.35	62.592	0.1	49	636	1237.4	1837	2205	634.9	1559	1813	25
269	26	Pon	640	11.35293	8.44	12.1232	-1.21	1.00249	7.1230	27.42	63.097	1.1	39	638	1237.0	1835	2311	727.6	1640	1809	26
270	27	Wto	641	11.39258	9.05	12.1608	-1.45	1.00221	8.0451	25.34	63.413	2.1	30	640	1236.7	1832	****	818.2	1708	1805	27
271	28	Śro	642	11.43224	9.25	12.1944	-2.08	1.00194	8.5439	22.21	63.542	3.1	22	642	1236.3	1830	025	905.9	1727	1801	28
272	29	Czw	643	11.47190	9.45	12.2321	-2.31	1.00166	9.4156	18.12	63.497	4.1	14	643	1236.0	1828	140	950.9	1741	1758	29
273	30	Pią	644	11.51155	10.04	12.2658	-2.55	1.00137	10.2707	13.21	63.301	5.1	8	645	1235.7	1825	256	1033.5	1751	1754	30

Fazy Księżyca [Dm, h.mm]: Nów 3, 20.45 1kw 11, 13.37 Pełn 18, 4.01 3kw 25, 8.41

WRZESIEŃ 2005 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE			MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)		
1	3.44	21.46	4.27	19.15	9.45	20.34	21.41	12.30	9.44	20.43	2.44	18.31	19.30	6.02	18.42	3.50	14.50	0.12			
	10.711	8.17	9.786	14.59	13.107	-7.15	3.039	14.35	13.172	-6.26	8.557	19.14	22.712	-9.03	21.207	-16.30	17.442	-15.14	22.68379	1	
3	3.49	21.40	4.38	19.15	9.51	20.29	21.34	12.26	9.38	20.35	2.37	18.23	19.22	5.54	18.34	3.42	14.42	0.04			
	10.831	7.44	10.018	13.64	13.249	-8.15	3.086	14.56	13.195	-6.41	8.572	19.08	22.707	-9.06	21.204	-16.31	17.442	-15.16	22.81521	3	
5	3.54	21.33	4.52	19.15	9.57	20.24	21.28	12.22	9.33	20.28	2.31	18.16	19.14	5.46	18.26	3.34	14.34	23.52			
	10.952	6.70	10.258	12.52	13.393	-9.15	3.131	14.77	13.219	-6.56	8.588	19.03	22.702	-9.09	21.200	-16.33	17.442	-15.17	22.94663	5	
7	3.59	21.27	5.05	19.14	10.03	20.20	21.21	12.18	9.27	20.21	2.24	18.09	19.06	5.37	18.18	3.25	14.27	23.44			
	11.072	5.96	10.500	11.27	13.536	-10.12	3.173	14.96	13.243	-6.71	8.603	18.98	22.697	-9.12	21.197	-16.34	17.443	-15.18	23.07804	7	
9	4.04	21.21	5.20	19.13	10.10	20.15	21.15	12.13	9.22	20.14	2.18	18.01	18.58	5.29	18.10	3.17	14.19	23.36			
	11.192	5.20	10.742	9.91	13.680	-11.09	3.213	15.14	13.267	-6.86	8.618	18.93	22.693	-9.15	21.194	-16.36	17.443	-15.19	23.20946	9	
11	4.09	21.15	5.34	19.11	10.16	20.10	21.08	12.09	9.16	20.06	2.11	17.54	18.50	5.21	18.02	3.09	14.11	23.28			
	11.312	4.44	10.982	8.46	13.824	-12.04	3.250	15.31	13.292	-7.01	8.633	18.88	22.688	-9.18	21.192	-16.37	17.444	-15.21	23.34089	11	
13	4.13	21.09	5.49	19.09	10.22	20.06	21.01	12.04	9.10	19.59	2.04	17.47	18.42	5.12	17.55	3.01	14.03	23.20			
	11.431	3.68	11.218	6.96	13.970	-12.97	3.283	15.48	13.317	-7.16	8.648	18.83	22.683	-9.21	21.189	-16.38	17.444	-15.22	23.47231	13	
15	4.18	21.03	6.04	19.07	10.28	20.01	20.54	11.59	9.05	19.52	1.58	17.39	18.34	5.04	17.47	2.53	13.56	23.12			
	11.551	2.91	11.449	5.41	14.115	-13.89	3.314	15.63	13.342	-7.32	8.662	18.78	22.678	-9.24	21.186	-16.39	17.445	-15.23	23.60373	15	
17	4.22	20.57	6.18	19.04	10.35	19.57	20.47	11.54	8.59	19.45	1.51	17.32	18.26	4.56	17.39	2.45	13.48	23.05			
	11.670	2.14	11.676	3.83	14.262	-14.79	3.342	15.77	13.367	-7.47	8.676	18.73	22.673	-9.27	21.183	-16.41	17.446	-15.24	23.73514	17	
19	4.27	20.52	6.32	19.01	10.41	19.52	20.40	11.48	8.54	19.38	1.44	17.25	18.18	4.47	17.31	2.37	13.40	22.57			
	11.790	1.37	11.897	2.25	14.409	-15.66	3.366	15.90	13.392	-7.63	8.690	18.68	22.668	-9.29	21.181	-16.42	17.447	-15.26	23.86656	19	
21	4.31	20.46	6.45	18.58	10.47	19.48	20.32	11.42	8.48	19.30	1.37	17.17	18.10	4.39	17.23	2.29	13.32	22.49			
	11.909	0.59	12.114	0.66	14.557	-16.52	3.387	16.02	13.418	-7.78	8.703	18.63	22.664	-9.32	21.178	-16.43	17.449	-15.27	23.99797	21	
23	4.35	20.40	6.58	18.54	10.53	19.44	20.25	11.36	8.43	19.23	1.31	17.10	18.02	4.31	17.15	2.21	13.25	22.41			
	12.029	-0.19	12.327	-0.91	14.705	-17.35	3.405	16.13	13.444	-7.94	8.716	18.59	22.659	-9.35	21.176	-16.44	17.450	-15.28	0.12940	23	
25	4.39	20.35	7.11	18.51	10.60	19.40	20.17	11.30	8.38	19.16	1.24	17.02	17.54	4.23	17.07	2.13	13.17	22.33			
	12.149	-0.97	12.535	-2.47	14.855	-18.15	3.419	16.23	13.470	-8.10	8.729	18.54	22.655	-9.37	21.174	-16.45	17.452	-15.30	0.26082	25	
27	4.43	20.30	7.24	18.47	11.06	19.36	20.09	11.23	8.32	19.09	1.17	16.55	17.46	4.14	16.59	2.05	13.09	22.25			
	12.269	-1.75	12.740	-4.00	15.005	-18.93	3.429	16.32	13.496	-8.25	8.742	18.50	22.650	-9.40	21.172	-16.46	17.453	-15.31	0.39224	27	
29	4.47	20.24	7.36	18.43	11.12	19.32	20.01	11.16	8.27	19.02	1.10	16.48	17.38	4.06	16.51	1.57	13.02	22.17			
	12.389	-2.52	12.941	-5.51	15.156	-19.68	3.435	16.40	13.523	-8.41	8.754	18.45	22.646	-9.42	21.170	-16.47	17.455	-15.32	0.52366	29	

PAŹDZIERNIK 2005

Piwnice, CA UMK ← Dane na godz. 12 czasu strefowego (= 10 lub 11 ^b UT) →													Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2453																					
274	1	Sob	645	11.55120	10.24	12.3035	-3.18	1.00109	11.1053	7.58	62.983	6.1	4	647	1235.4	1823	410	1114.5	1800	1750	1
275	2	Nie	646	11.59086	10.43	12.3412	-3.41	1.00081	11.5402	2.13	62.574	7.1	1	649	1235.0	1820	524	1154.8	1808	1746	2
276	3	Pon	647	12.03051	11.01	12.3750	-4.05	1.00052	12.3730	-3.41	62.103	8.1	0	650	1234.7	1818	639	1235.4	1816	1742	3
277	4	Wto	648	12.07017	11.20	12.4128	-4.28	1.00023	13.2215	-9.33	61.596	1.0	1	652	1234.4	1816	755	1317.5	1825	1738	4
278	5	Śro	649	12.10582	11.38	12.4507	-4.51	0.99994	14.0917	-15.08	61.072	2.0	4	654	1234.1	1813	915	1402.1	1836	1734	5
279	6	Czw	650	12.14548	11.56	12.4846	-5.14	0.99965	14.5930	-20.09	60.541	3.0	9	656	1233.8	1811	1038	1450.3	1851	1730	6
280	7	Pią	651	12.18514	12.13	12.5225	-5.37	0.99936	15.5335	-24.17	60.012	4.0	16	658	1233.5	1809	1204	1542.9	1913	1726	7
281	8	Sob	652	12.22479	12.30	12.5605	-5.60	0.99907	16.5138	-27.11	59.489	5.0	25	659	1233.2	1806	1327	1639.8	1947	1722	8
282	9	Nie	653	12.26445	12.46	12.5945	-6.23	0.99877	17.5252	-28.32	58.978	6.0	35	701	1233.0	1804	1440	1740.0	2040	1718	9
283	10	Pon	654	12.30410	13.02	13.0325	-6.45	0.99848	18.5539	-28.08	58.490	7.0	46	703	1232.7	1802	1535	1841.4	2153	1714	10
284	11	Wto	655	12.34376	13.18	13.0706	-7.08	0.99819	19.5756	-25.56	58.047	0.6	57	705	1232.4	1759	1611	1941.6	2321	1710	11
285	12	Śro	656	12.38342	13.33	13.1047	-7.31	0.99789	20.5800	-22.05	57.676	1.6	68	707	1232.2	1757	1635	2039.0	****	1706	12
286	13	Czw	657	12.42307	13.48	13.1429	-7.53	0.99760	21.5504	-16.53	57.415	2.6	79	708	1232.0	1755	1652	2132.9	055	1703	13
287	14	Pią	658	12.46273	14.02	13.1812	-8.15	0.99731	22.4917	-10.42	57.300	3.6	87	710	1231.7	1752	1705	2223.9	229	1659	14
288	15	Sob	659	12.50238	14.15	13.2155	-8.38	0.99703	23.4122	-3.56	57.363	4.6	94	712	1231.5	1750	1715	2313.1	401	1655	15
289	16	Nie	660	12.54204	14.29	13.2538	-8.60	0.99674	0.3224	2.59	57.623	5.6	98	714	1231.3	1748	1725	*****	530	1651	16
290	17	Pon	661	12.58169	14.41	13.2922	-9.22	0.99646	1.2328	9.42	58.079	6.6	100	716	1231.1	1746	1736	001.6	659	1647	17
291	18	Wto	662	13.02135	14.53	13.3307	-9.43	0.99617	2.1531	15.48	58.706	0.9	99	717	1230.9	1743	1749	050.8	828	1643	18
292	19	Śro	663	13.06100	15.04	13.3652	-10.05	0.99590	3.0912	20.58	59.461	1.9	95	719	1230.7	1741	1806	141.5	958	1639	19
293	20	Czw	664	13.10066	15.15	13.4038	-10.27	0.99562	4.0439	24.56	60.285	2.9	90	721	1230.5	1739	1830	234.1	1124	1635	20
294	21	Pią	665	13.14031	15.25	13.4425	-10.48	0.99534	5.0123	27.30	61.113	3.9	83	723	1230.3	1737	1904	328.5	1244	1631	21
295	22	Sob	666	13.17597	15.34	13.4812	-11.09	0.99507	5.5821	28.33	61.880	4.9	75	725	1230.2	1735	1953	423.6	1349	1627	22
296	23	Nie	667	13.21562	15.43	13.5200	-11.30	0.99480	6.5415	28.08	62.531	5.9	66	727	1230.0	1733	2055	518.0	1437	1623	23
297	24	Pon	668	13.25528	15.50	13.5549	-11.51	0.99454	7.4759	26.23	63.021	6.9	56	729	1229.9	1730	2207	610.3	1510	1619	24
298	25	Wto	669	13.29494	15.58	13.5938	-12.12	0.99427	8.3855	23.28	63.321	0.4	47	730	1229.8	1728	2323	659.6	1532	1615	25
299	26	Śro	670	13.33459	16.04	14.0328	-12.33	0.99401	9.2702	19.36	63.419	1.4	37	732	1229.7	1726	****	745.7	1548	1611	26
300	27	Czw	671	13.37425	16.10	14.0719	-12.53	0.99374	10.1244	14.58	63.318	2.4	28	734	1229.6	1724	039	829.1	1559	1607	27
301	28	Pią	672	13.41390	16.15	14.1111	-13.13	0.99348	10.5644	9.45	63.036	3.4	20	736	1229.5	1722	153	910.4	1609	1604	28
302	29	Sob	673	13.45356	16.19	14.1503	-13.33	0.99322	11.3954	4.07	62.604	4.4	13	738	1229.4	1720	307	950.8	1617	1600	29
303	30	Nie	674	13.49321	16.22	14.1857	-13.53	0.99296	12.2314	-1.46	62.062	5.4	7	740	1229.4	1718	421	1031.3	1625	1556	30
303	30	Nie	674	14.49420	16.22	14.1906	-13.53	0.99295	12.2503	-2.00	62.037	5.4	7	640	1129.4	1618	321	931.3	1525	1456	30
304	31	Pon	675	14.53385	16.25	14.2300	-14.13	0.99269	13.0939	-7.56	61.428	6.4	3	642	1129.3	1616	437	1012.9	1534	1452	31

Fazy Księżyca [Dm, h.mm]: Nów 3, 12.28 1kw 10, 21.01 Pełn 17, 14.14 3kw 25, 3.17 3kw 25, 2.17

PAŹDZIERNIK 2005 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach		
1	4.51	20.19	7.48	18.39	11.18	19.28	19.53	11.09	8.21	18.55	1.03	16.40	17.30	3.58	16.43	1.49	12.54	22.10		
	12.510	-3.30	13.140	-6.98	15.308	-20.40	3.437	16.46	13.549	-8.57	8.766	18.41	22.642	-9.45	21.168	-16.48	17.457	-15.34	0.65508	1
3	4.55	20.14	7.60	18.35	11.24	19.25	19.45	11.01	8.16	18.48	0.56	16.33	17.22	3.50	16.35	1.41	12.46	22.02		
	12.631	-4.08	13.336	-8.42	15.461	-21.09	3.435	16.52	13.576	-8.73	8.777	18.37	22.638	-9.47	21.166	-16.48	17.459	-15.35	0.78649	3
5	4.59	20.09	8.11	18.31	11.30	19.22	19.36	10.53	8.10	18.40	0.49	16.25	17.14	3.41	16.27	1.33	12.39	21.54		
	12.752	-4.85	13.530	-9.82	15.615	-21.75	3.429	16.56	13.603	-8.88	8.788	18.33	22.634	-9.49	21.165	-16.49	17.462	-15.36	0.91791	5
7	5.03	20.04	8.23	18.27	11.36	19.18	19.28	10.45	8.05	18.33	0.43	16.18	17.06	3.33	16.19	1.25	12.31	21.46		
	12.874	-5.61	13.723	-11.17	15.769	-22.37	3.418	16.60	13.630	-9.04	8.799	18.29	22.630	-9.51	21.163	-16.50	17.464	-15.37	1.04933	7
9	5.06	19.59	8.34	18.23	11.42	19.16	19.19	10.36	7.60	18.26	0.36	16.10	16.58	3.25	16.11	1.17	12.23	21.38		
	12.996	-6.38	13.913	-12.48	15.924	-22.96	3.404	16.62	13.657	-9.20	8.810	18.26	22.627	-9.54	21.162	-16.50	17.467	-15.39	1.18075	9
11	5.10	19.55	8.45	18.19	11.47	19.13	19.10	10.27	7.54	18.19	0.28	16.03	16.50	3.17	16.04	1.09	12.16	21.31		
	13.118	-7.13	14.103	-13.75	16.079	-23.51	3.386	16.64	13.684	-9.36	8.820	18.22	22.623	-9.56	21.161	-16.51	17.469	-15.40	1.31217	11
13	5.14	19.50	8.55	18.15	11.53	19.10	19.01	10.18	7.49	18.12	0.21	15.55	16.42	3.09	15.56	1.01	12.08	21.23		
	13.241	-7.88	14.291	-14.96	16.234	-24.03	3.363	16.64	13.711	-9.51	8.829	18.19	22.620	-9.57	21.160	-16.51	17.472	-15.41	1.44359	13
15	5.17	19.46	9.06	18.11	11.58	19.08	18.51	10.09	7.44	18.05	0.14	15.48	16.34	3.00	15.48	0.53	12.01	21.15		
	13.365	-8.63	14.478	-16.12	16.390	-24.51	3.337	16.63	13.739	-9.67	8.839	18.16	22.617	-9.59	21.159	-16.52	17.475	-15.43	1.57501	15
17	5.21	19.41	9.16	18.08	12.03	19.06	18.42	9.59	7.38	17.58	0.07	15.40	16.27	2.52	15.40	0.45	11.53	21.07		
	13.490	-9.36	14.664	-17.22	16.546	-24.95	3.307	16.61	13.766	-9.82	8.847	18.13	22.614	-9.61	21.158	-16.52	17.478	-15.44	1.70642	17
19	5.24	19.37	9.26	18.04	12.08	19.04	18.32	9.49	7.33	17.51	23.56	15.33	16.19	2.44	15.32	0.37	11.45	20.60		
	13.615	-10.09	14.848	-18.26	16.702	-25.35	3.274	16.58	13.793	-9.98	8.856	18.10	22.611	-9.62	21.157	-16.52	17.481	-15.45	1.83784	19
21	5.28	19.33	9.35	18.01	12.12	19.03	18.22	9.39	7.28	17.44	23.49	15.25	16.11	2.36	15.24	0.29	11.38	20.52		
	13.740	-10.80	15.031	-19.25	16.858	-25.70	3.238	16.54	13.821	-10.14	8.864	18.07	22.608	-9.64	21.157	-16.53	17.485	-15.47	1.96926	21
23	5.31	19.29	9.44	17.58	12.16	19.02	18.12	9.28	7.22	17.37	23.42	15.18	16.03	2.28	15.16	0.21	11.30	20.44		
	13.867	-11.51	15.212	-20.16	17.014	-26.02	3.198	16.50	13.849	-10.29	8.871	18.05	22.606	-9.65	21.157	-16.53	17.488	-15.48	2.10069	23
25	5.35	19.25	9.53	17.55	12.20	19.01	18.02	9.17	7.17	17.29	23.34	15.10	15.55	2.20	15.08	0.13	11.23	20.36		
	13.994	-12.20	15.390	-21.00	17.169	-26.30	3.156	16.44	13.876	-10.44	8.879	18.02	22.603	-9.66	21.157	-16.53	17.492	-15.49	2.23211	25
27	5.38	19.21	10.01	17.52	12.23	18.60	17.52	9.06	7.12	17.22	23.27	15.02	15.47	2.12	15.01	0.05	11.15	20.29		
	14.122	-12.88	15.565	-21.77	17.324	-26.53	3.111	16.37	13.904	-10.60	8.885	18.00	22.601	-9.68	21.157	-16.53	17.495	-15.50	2.36353	27
29	5.41	19.18	10.08	17.49	12.26	18.60	17.42	8.55	7.06	17.15	23.20	14.55	15.39	2.04	14.53	23.54	11.08	20.21		
	14.251	-13.55	15.734	-22.46	17.477	-26.73	3.065	16.30	13.931	-10.75	8.891	17.98	22.599	-9.69	21.157	-16.53	17.499	-15.51	2.49494	29
31	4.45	18.14	9.15	16.47	11.29	17.60	16.32	7.44	6.01	16.08	22.12	13.47	14.31	0.56	13.45	22.46	10.00	19.13		
	14.383	-14.22	15.901	-23.08	17.633	-26.88	3.016	16.21	13.960	-10.90	8.897	17.96	22.598	-9.70	21.157	-16.53	17.503	-15.53	2.62636	31

LISTOPAD 2005

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2453																			
305	1	Wto	676	14.57351	16.26	14.2655	-14.32	0.99244	13.5631	-13.41	60.800	7.4	0	644	1129.3	1614	556	1057.0	1544	1448	1	
306	2	Śro	677	15.01316	16.27	14.3051	-14.51	0.99218	14.4641	-18.56	60.195	0.4	0	646	1129.3	1612	719	1144.6	1558	1444	2	
307	3	Czw	678	15.05282	16.27	14.3447	-15.10	0.99192	15.4051	-23.23	59.645	1.4	2	647	1129.3	1610	846	1236.7	1618	1440	3	
308	4	Pią	679	15.09248	16.27	14.3845	-15.29	0.99167	16.3910	-26.38	59.171	2.4	7	649	1129.3	1609	1013	1333.4	1648	1436	4	
309	5	Sob	680	15.13213	16.25	14.4243	-15.47	0.99142	17.4050	-28.20	58.782	3.4	13	651	1129.3	1607	1131	1433.8	1735	1432	5	
310	6	Nie	681	15.17179	16.23	14.4642	-16.05	0.99116	18.4405	-28.16	58.478	4.4	22	653	1129.4	1605	1232	1535.7	1842	1428	6	
311	7	Pon	682	15.21144	16.20	14.5041	-16.23	0.99091	19.4639	-26.23	58.254	5.4	32	655	1129.4	1603	1314	1636.4	2007	1424	7	
312	8	Wto	683	15.25110	16.16	14.5442	-16.40	0.99067	20.4641	-22.51	58.103	6.4	43	657	1129.5	1601	1341	1734.1	2139	1420	8	
313	9	Śro	684	15.29076	16.11	14.5843	-16.57	0.99042	21.4322	-17.59	58.024	0.4	54	659	1129.6	1600	1359	1827.9	2311	1416	9	
314	10	Czw	685	15.33041	16.05	15.0245	-17.14	0.99018	22.3649	-12.08	58.020	1.4	66	701	1129.7	1558	1412	1918.3	****	1412	10	
315	11	Pią	686	15.37007	15.59	15.0648	-17.31	0.98994	23.2751	-5.40	58.101	2.4	76	702	1129.8	1556	1423	2006.4	040	1408	11	
316	12	Sob	687	15.40572	15.51	15.1052	-17.47	0.98970	0.1736	1.02	58.279	3.4	85	704	1129.9	1555	1433	2053.6	208	1405	12	
317	13	Nie	688	15.44538	15.43	15.1457	-18.03	0.98947	1.0716	7.40	58.569	4.4	92	706	1130.0	1553	1443	2141.1	334	1401	13	
318	14	Pon	689	15.48503	15.34	15.1902	-18.19	0.98924	1.5755	13.51	58.974	5.4	97	708	1130.2	1552	1455	2230.1	501	1357	14	
319	15	Wto	690	15.52469	15.24	15.2309	-18.34	0.98902	2.5023	19.17	59.490	6.4	100	710	1130.3	1550	1510	2321.4	629	1353	15	
320	16	Śro	691	15.56434	15.14	15.2716	-18.49	0.98880	3.4502	23.39	60.097	0.4	100	712	1130.5	1549	1530	*****	756	1349	16	
321	17	Czw	692	16.00400	15.02	15.3124	-19.04	0.98859	4.4137	26.42	60.764	1.4	98	713	1130.7	1547	1600	015.0	920	1345	17	
322	18	Pią	693	16.04366	14.50	15.3533	-19.18	0.98838	5.3908	28.16	61.444	2.4	94	715	1130.9	1546	1642	110.4	1032	1341	18	
323	19	Sob	694	16.08331	14.37	15.3943	-19.32	0.98818	6.3610	28.19	62.090	3.4	88	717	1131.1	1545	1740	205.9	1129	1337	19	
324	20	Nie	695	16.12297	14.23	15.4353	-19.46	0.98798	7.3117	26.56	62.649	4.4	81	719	1131.4	1543	1849	259.9	1208	1333	20	
325	21	Pon	696	16.16262	14.08	15.4805	-19.59	0.98778	8.2333	24.19	63.076	5.4	73	721	1131.6	1542	2004	351.1	1235	1329	21	
326	22	Wto	697	16.20228	13.52	15.5217	-20.12	0.98759	9.1242	20.42	63.334	6.4	64	722	1131.9	1541	2120	438.8	1253	1325	22	
327	23	Śro	698	16.24194	13.36	15.5630	-20.25	0.98740	9.5901	16.17	63.396	7.4	54	724	1132.1	1540	2235	523.3	1306	1321	23	
328	24	Czw	699	16.28159	13.19	16.0044	-20.37	0.98722	10.4313	11.15	63.252	0.5	45	726	1132.4	1539	2348	605.2	1316	1317	24	
329	25	Pią	700	16.32125	13.01	16.0458	-20.49	0.98704	11.2611	5.47	62.908	1.5	36	727	1132.7	1538	****	645.5	1325	1313	25	
330	26	Sob	701	16.36090	12.42	16.0913	-21.00	0.98687	12.0857	0.02	62.386	2.5	27	729	1133.0	1537	101	725.4	1333	1310	26	
331	27	Nie	702	16.40056	12.22	16.1329	-21.11	0.98670	12.5238	-5.50	61.724	3.5	18	731	1133.4	1536	215	806.0	1341	1306	27	
332	28	Pon	703	16.44021	12.02	16.1746	-21.22	0.98653	13.3823	-11.37	60.969	4.5	11	732	1133.7	1535	332	848.7	1351	1302	28	
333	29	Wto	704	16.47587	11.41	16.2204	-21.32	0.98636	14.2721	-17.05	60.182	5.5	6	734	1134.1	1534	453	934.7	1403	1258	29	
334	30	Śro	705	16.51552	11.20	16.2622	-21.42	0.98620	15.2031	-21.52	59.424	6.5	2	735	1134.4	1533	619	1025.2	1420	1254	30	

Fazy Księżyca [Dm, h.mm]: Now 2, 2.25 1kw 9, 2.57 Pełn 16, 1.58 3kw 23, 23.11

LISTOPAD 2005 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.46	18.12	9.17	16.46	11.30	17.60	16.27	7.38	5.58	16.05	22.09	13.43	14.27	0.52	13.41	22.42	9.56	19.09		
	14.449	-14.54	15.980	-23.34	17.709	-26.94	2.991	16.17	13.973	-10.98	8.900	17.95	22.597	-9.70	21.157	-16.53	17.505	-15.53	2.69207	1
3	4.50	18.09	9.22	16.43	11.32	18.00	16.16	7.27	5.53	15.58	22.01	13.36	14.19	0.44	13.33	22.34	9.49	19.02		
	14.580	-15.17	16.130	-23.80	17.860	-27.03	2.942	16.08	14.001	-11.13	8.905	17.94	22.595	-9.71	21.158	-16.53	17.509	-15.54	2.82349	3
5	4.53	18.06	9.25	16.41	11.34	18.01	16.06	7.15	5.48	15.51	21.54	13.28	14.11	0.36	13.25	22.26	9.41	18.54		
	14.712	-15.78	16.267	-24.16	18.009	-27.08	2.893	15.99	14.029	-11.28	8.910	17.92	22.594	-9.71	21.158	-16.52	17.513	-15.56	2.95491	5
7	4.56	18.03	9.26	16.38	11.35	18.02	15.56	7.04	5.42	15.44	21.46	13.20	14.03	0.28	13.17	22.18	9.34	18.46		
	14.845	-16.38	16.387	-24.40	18.156	-27.08	2.843	15.89	14.056	-11.42	8.914	17.91	22.593	-9.72	21.159	-16.52	17.517	-15.57	3.08634	7
9	4.59	18.00	9.25	16.35	11.35	18.03	15.46	6.53	5.37	15.37	21.38	13.13	13.55	0.20	13.10	22.11	9.26	18.39		
	14.979	-16.96	16.487	-24.53	18.300	-27.05	2.795	15.80	14.084	-11.57	8.917	17.90	22.592	-9.72	21.160	-16.51	17.521	-15.58	3.21776	9
11	5.02	17.57	9.22	16.32	11.35	18.04	15.36	6.41	5.31	15.29	21.31	13.05	13.48	0.12	13.02	22.03	9.19	18.31		
	15.113	-17.51	16.559	-24.51	18.443	-26.98	2.747	15.70	14.111	-11.72	8.920	17.90	22.592	-9.72	21.161	-16.51	17.526	-15.59	3.34918	11
13	5.06	17.55	9.15	16.28	11.35	18.05	15.25	6.30	5.26	15.22	21.23	12.57	13.40	0.04	12.54	21.55	9.11	18.23		
	15.249	-18.05	16.597	-24.33	18.582	-26.87	2.701	15.61	14.139	-11.86	8.923	17.89	22.591	-9.72	21.162	-16.50	17.530	-15.60	3.48059	13
15	5.09	17.52	9.04	16.22	11.34	18.07	15.16	6.19	5.21	15.15	21.15	12.49	13.32	23.52	12.46	21.47	9.03	18.16		
	15.386	-18.57	16.595	-23.98	18.718	-26.72	2.657	15.53	14.166	-12.00	8.925	17.89	22.591	-9.72	21.164	-16.50	17.535	-15.61	3.61201	15
17	5.12	17.50	8.49	16.16	11.32	18.09	15.06	6.08	5.15	15.08	21.08	12.42	13.24	23.45	12.38	21.40	8.56	18.08		
	15.523	-19.06	16.548	-23.44	18.851	-26.54	2.616	15.45	14.193	-12.14	8.926	17.89	22.591	-9.72	21.165	-16.49	17.539	-15.62	3.74343	17
19	5.14	17.48	8.30	16.08	11.30	18.10	14.56	5.58	5.10	15.01	20.60	12.34	13.16	23.37	12.30	21.32	8.48	18.00		
	15.662	-19.54	16.453	-22.68	18.980	-26.33	2.577	15.37	14.220	-12.28	8.928	17.89	22.591	-9.72	21.167	-16.48	17.544	-15.63	3.87486	19
21	5.17	17.46	8.07	15.59	11.28	18.12	14.46	5.47	5.04	14.54	20.52	12.26	13.08	23.29	12.23	21.24	8.41	17.53		
	15.801	-19.99	16.314	-21.71	19.106	-26.08	2.540	15.31	14.247	-12.42	8.928	17.89	22.592	-9.72	21.169	-16.48	17.549	-15.64	4.00628	21
23	5.20	17.45	7.41	15.49	11.25	18.14	14.37	5.37	4.59	14.47	20.44	12.18	13.00	23.21	12.15	21.16	8.33	17.45		
	15.942	-20.41	16.144	-20.59	19.227	-25.80	2.507	15.25	14.274	-12.56	8.928	17.89	22.592	-9.71	21.171	-16.47	17.554	-15.65	4.13770	23
25	5.23	17.43	7.14	15.38	11.21	18.15	14.27	5.27	4.53	14.40	20.36	12.10	12.52	23.13	12.07	21.09	8.26	17.37		
	16.083	-20.81	15.964	-19.41	19.343	-25.50	2.477	15.21	14.301	-12.69	8.928	17.90	22.593	-9.70	21.173	-16.46	17.558	-15.66	4.26912	25
27	5.25	17.42	6.49	15.28	11.17	18.17	14.18	5.17	4.48	14.33	20.28	12.02	12.45	23.06	11.59	21.01	8.18	17.30		
	16.225	-21.19	15.797	-18.30	19.454	-25.17	2.451	15.17	14.327	-12.82	8.927	17.91	22.594	-9.70	21.175	-16.45	17.563	-15.67	4.40054	27
29	5.28	17.41	6.27	15.18	11.13	18.18	14.09	5.08	4.42	14.26	20.20	11.55	12.37	22.58	11.51	20.53	8.11	17.22		
	16.368	-21.53	15.663	-17.38	19.560	-24.81	2.428	15.15	14.354	-12.96	8.925	17.92	22.596	-9.69	21.178	-16.44	17.568	-15.68	4.53196	29

GRUDZIEŃ 2005

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°/′	j astr	h.mmss	°/′	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2453																		
335	1	Czw	706	16.55518	10.57	16.3041	-21.51	0.98604	16.1823	-25.37	58.753	7.5	0	737	1134.8	1533	748	1121.0	1446	1250	1
336	2	Pią	707	16.59484	10.34	16.3500	-22.00	0.98588	17.2030	-27.53	58.215	0.8	1	738	1135.2	1532	913	1221.6	1527	1246	2
337	3	Sob	708	17.03449	10.11	16.3921	-22.09	0.98573	18.2509	-28.21	57.841	1.8	4	740	1135.6	1531	1023	1325.1	1629	1242	3
338	4	Nie	709	17.07415	9.46	16.4341	-22.17	0.98557	19.2947	-26.54	57.640	2.8	10	741	1136.0	1531	1113	1428.3	1751	1238	4
339	5	Pon	710	17.11381	9.22	16.4803	-22.25	0.98543	20.3158	-23.41	57.603	3.8	19	742	1136.4	1530	1144	1528.5	1923	1234	5
340	6	Wto	711	17.15346	8.57	16.5224	-22.32	0.98528	21.3021	-19.00	57.709	4.8	28	744	1136.8	1530	1205	1624.4	2057	1230	6
341	7	Śro	712	17.19312	8.31	16.5647	-22.39	0.98514	22.2450	-13.18	57.927	5.8	39	745	1137.2	1529	1220	1716.0	2228	1226	7
342	8	Czw	713	17.23277	8.05	17.0110	-22.45	0.98500	23.1611	-6.58	58.229	0.1	51	746	1137.7	1529	1232	1804.4	2355	1222	8
343	9	Pią	714	17.27243	7.38	17.0533	-22.51	0.98487	0.0534	-0.23	58.590	1.1	62	747	1138.1	1529	1241	1851.0	****	1218	9
344	10	Sob	715	17.31208	7.11	17.0956	-22.57	0.98474	0.5416	6.09	58.993	2.1	72	748	1138.6	1528	1251	1937.2	120	1214	10
345	11	Nie	716	17.35174	6.43	17.1420	-23.02	0.98462	1.4331	12.19	59.432	3.1	81	750	1139.0	1528	1302	2024.4	244	1211	11
346	12	Pon	717	17.39140	6.16	17.1845	-23.06	0.98450	2.3418	17.50	59.902	4.1	89	751	1139.5	1528	1315	2113.7	409	1207	12
347	13	Wto	718	17.43105	5.47	17.2309	-23.10	0.98439	3.2717	22.26	60.402	5.1	95	752	1140.0	1528	1333	2205.4	535	1203	13
348	14	Śro	719	17.47071	5.19	17.2735	-23.14	0.98429	4.2231	25.50	60.927	6.1	98	753	1140.4	1528	1358	2259.5	659	1159	14
349	15	Czw	720	17.51036	4.50	17.3160	-23.17	0.98419	5.1922	27.51	61.465	7.1	100	753	1140.9	1528	1435	2354.8	816	1155	15
350	16	Pią	721	17.55002	4.21	17.3625	-23.20	0.98410	6.1632	28.22	61.998	0.8	99	754	1141.4	1528	1527	*****	918	1151	16
351	17	Sob	722	17.58568	3.52	17.4051	-23.22	0.98401	7.1229	27.25	62.499	1.8	97	755	1141.9	1529	1633	049.6	1004	1147	17
352	18	Nie	723	18.02533	3.23	17.4517	-23.24	0.98393	8.0558	25.10	62.933	2.8	93	756	1142.4	1529	1746	142.2	1036	1143	18
353	19	Pon	724	18.06499	2.53	17.4943	-23.25	0.98385	8.5620	21.48	63.266	3.8	87	756	1142.9	1529	1903	231.6	1057	1139	19
354	20	Wto	725	18.10464	2.23	17.5409	-23.26	0.98379	9.4337	17.36	63.462	4.8	80	757	1143.4	1530	2018	317.5	1112	1135	20
355	21	Śro	726	18.14430	1.54	17.5836	-23.26	0.98372	10.2820	12.45	63.490	5.8	72	758	1143.9	1530	2132	400.3	1123	1131	21
356	22	Czw	727	18.18396	1.24	18.0302	-23.26	0.98367	11.1118	7.26	63.329	6.8	63	758	1144.3	1531	2244	440.9	1132	1127	22
357	23	Pią	728	18.22361	0.54	18.0728	-23.26	0.98361	11.5331	1.50	62.972	7.8	53	759	1144.8	1531	2356	520.3	1140	1123	23
358	24	Sob	729	18.26327	0.24	18.1155	-23.25	0.98357	12.3604	-3.54	62.423	0.6	44	759	1145.3	1532	****	559.8	1148	1119	24
359	25	Nie	730	18.30292	-0.06	18.1621	-23.23	0.98352	13.2007	-9.37	61.707	1.6	34	759	1145.8	1533	110	640.6	1157	1115	25
360	26	Pon	731	18.34258	-0.35	18.2047	-23.21	0.98349	14.0654	-15.07	60.863	2.6	25	759	1146.3	1533	227	724.0	1207	1112	26
361	27	Wto	732	18.38223	-1.05	18.2514	-23.19	0.98345	14.5735	-20.07	59.948	3.6	17	800	1146.8	1534	350	811.5	1222	1108	27
362	28	Śro	733	18.42189	-1.35	18.2940	-23.16	0.98342	15.5308	-24.17	59.031	4.6	9	800	1147.3	1535	517	904.3	1243	1104	28
363	29	Czw	734	18.46155	-2.04	18.3406	-23.13	0.98340	16.5343	-27.10	58.187	5.6	4	800	1147.8	1536	644	1002.7	1316	1100	29
364	30	Pią	735	18.50120	-2.33	18.3831	-23.09	0.98338	17.5821	-28.22	57.490	6.6	1	800	1148.3	1537	803	1105.9	1408	1056	30
365	31	Sob	736	18.54086	-3.02	18.4257	-23.04	0.98336	19.0439	-27.37	56.997	0.3	0	800	1148.8	1538	903	1211.0	1523	1052	31

Fazy Księżyca [Dm, h.mm]: Nów 1, 16.01 1kw 8, 10.36 Pełn 15, 17.15 3kw 23, 20.36 Nów 31, 4.12

GRUDZIEŃ 2005 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	5.30	17.40	6.10	15.08	11.08	18.19	14.00	4.59	4.37	14.19	20.12	11.47	12.29	22.50	11.44	20.46	8.03	17.15		
	16.511	-21.85	15.576	-16.75	19.660	-24.43	2.409	15.15	14.380	-13.08	8.923	17.94	22.597	-9.68	21.180	-16.43	17.573	-15.69	4.66338	1
3	5.33	17.39	5.58	15.00	11.03	18.20	13.51	4.50	4.31	14.12	20.04	11.39	12.21	22.42	11.36	20.38	7.56	17.07		
	16.656	-22.15	15.538	-16.42	19.754	-24.03	2.393	15.15	14.406	-13.21	8.921	17.95	22.599	-9.66	21.183	-16.42	17.578	-15.70	4.79481	3
5	5.35	17.38	5.51	14.53	10.57	18.21	13.43	4.42	4.26	14.05	19.56	11.31	12.13	22.35	11.28	20.31	7.48	16.59		
	16.801	-22.41	15.548	-16.39	19.841	-23.62	2.381	15.17	14.432	-13.34	8.918	17.97	22.601	-9.65	21.186	-16.40	17.583	-15.70	4.92623	5
7	5.37	17.38	5.47	14.47	10.51	18.21	13.34	4.34	4.20	13.58	19.48	11.23	12.06	22.27	11.20	20.23	7.41	16.52		
	16.946	-22.65	15.598	-16.60	19.921	-23.19	2.373	15.20	14.457	-13.46	8.915	17.99	22.603	-9.64	21.189	-16.39	17.588	-15.71	5.05765	7
9	5.39	17.38	5.47	14.42	10.44	18.21	13.26	4.26	4.14	13.51	19.39	11.15	11.58	22.19	11.13	20.15	7.33	16.44		
	17.092	-22.85	15.682	-17.00	19.993	-22.75	2.369	15.25	14.482	-13.58	8.911	18.01	22.605	-9.62	21.192	-16.38	17.593	-15.72	5.18907	9
11	5.41	17.38	5.49	14.37	10.36	18.20	13.17	4.18	4.09	13.44	19.31	11.07	11.50	22.12	11.05	20.08	7.26	16.36		
	17.239	-23.03	15.794	-17.53	20.057	-22.30	2.368	15.31	14.507	-13.70	8.906	18.03	22.608	-9.61	21.195	-16.36	17.599	-15.73	5.32049	11
13	5.43	17.38	5.53	14.33	10.29	18.19	13.09	4.11	4.03	13.37	19.23	10.59	11.42	22.04	10.57	20.00	7.18	16.29		
	17.386	-23.17	15.928	-18.14	20.113	-21.84	2.370	15.39	14.532	-13.82	8.901	18.06	22.611	-9.59	21.198	-16.35	17.604	-15.73	5.45191	13
15	5.44	17.38	5.59	14.30	10.20	18.17	13.01	4.04	3.57	13.30	19.14	10.51	11.34	21.57	10.49	19.53	7.11	16.21		
	17.533	-23.28	16.079	-18.81	20.159	-21.38	2.376	15.47	14.557	-13.93	8.896	18.08	22.614	-9.57	21.202	-16.33	17.609	-15.74	5.58333	15
17	5.46	17.39	6.05	14.28	10.11	18.14	12.53	3.57	3.51	13.22	19.06	10.43	11.27	21.49	10.42	19.45	7.03	16.14		
	17.681	-23.37	16.244	-19.50	20.195	-20.92	2.386	15.57	14.581	-14.04	8.890	18.11	22.617	-9.55	21.205	-16.32	17.614	-15.75	5.71476	17
19	5.47	17.40	6.13	14.26	10.02	18.11	12.45	3.51	3.46	13.15	18.58	10.35	11.19	21.42	10.34	19.38	6.56	16.06		
	17.829	-23.42	16.421	-20.19	20.221	-20.47	2.398	15.68	14.605	-14.15	8.884	18.14	22.620	-9.53	21.209	-16.30	17.619	-15.75	5.84618	19
21	5.48	17.41	6.20	14.25	9.52	18.07	12.38	3.45	3.40	13.08	18.49	10.27	11.11	21.34	10.26	19.30	6.48	15.59		
	17.977	-23.44	16.606	-20.85	20.237	-20.02	2.414	15.81	14.628	-14.26	8.878	18.18	22.624	-9.50	21.213	-16.29	17.624	-15.76	5.97760	21
23	5.49	17.42	6.28	14.24	9.41	18.03	12.30	3.39	3.34	13.01	18.41	10.19	11.03	21.27	10.18	19.22	6.41	15.51		
	18.125	-23.43	16.800	-21.48	20.241	-19.57	2.433	15.94	14.651	-14.37	8.870	18.21	22.628	-9.48	21.217	-16.27	17.629	-15.76	6.10902	23
25	5.50	17.43	6.37	14.24	9.30	17.57	12.23	3.33	3.28	12.54	18.32	10.11	10.55	21.19	10.11	19.15	6.33	15.43		
	18.273	-23.39	16.999	-22.06	20.234	-19.14	2.454	16.09	14.674	-14.47	8.863	18.24	22.632	-9.46	21.220	-16.25	17.634	-15.77	6.24044	25
27	5.50	17.44	6.45	14.24	9.18	17.51	12.15	3.28	3.22	12.47	18.24	10.03	10.48	21.12	10.03	19.07	6.26	15.36		
	18.420	-23.31	17.203	-22.58	20.215	-18.72	2.478	16.24	14.697	-14.57	8.855	18.28	22.636	-9.43	21.225	-16.23	17.640	-15.77	6.37186	27
29	5.51	17.46	6.53	14.26	9.06	17.44	12.08	3.23	3.16	12.40	18.15	9.54	10.40	21.04	9.55	18.60	6.18	15.28		
	18.568	-23.21	17.413	-23.05	20.184	-18.31	2.506	16.40	14.719	-14.67	8.847	18.32	22.640	-9.40	21.229	-16.22	17.645	-15.78	6.50328	29
31	5.51	17.48	7.01	14.27	8.53	17.36	12.01	3.18	3.10	12.33	18.06	9.46	10.32	20.57	9.47	18.52	6.10	15.21		
	18.716	-23.07	17.626	-23.44	20.143	-17.92	2.535	16.58	14.740	-14.76	8.839	18.36	22.644	-9.38	21.233	-16.20	17.650	-15.78	6.63471	31

Święta państwowe i kościelne w Polsce oraz inne ważniejsze dni w roku 2005

Nowy Rok	Sob	1 styczeń	Trójcy Najświętszej	Nie	22 maj
Najświętszej Maryi Panny Rodzicielki	Sob	1 styczeń	Boże Ciało	Czw	26 maj
Objawienia Pańskiego (Trzech Króli)	Czw	6 styczeń	Dzień Matki	Czw	26 maj
Juliański Nowy Rok	Pią	14 styczeń	Dzień Dziecka	Śro	1 czerwiec
Dzień Babci	Pią	21 styczeń	Najświętszego Serca Pana Jezusa	Pią	3 czerwiec
Dzień Dziadka	Sob	22 styczeń	Dzień Dzięczynienia	Nie	5 czerwiec
Ofiarowania Pańskiego	Śro	2 luty	Dzień Ojca	Czw	23 czerwiec
Matki Boskiej Gromnicznej	Śro	2 luty	Noc Świętojańska	Czw	23 czerwiec
Tłusty czwartek	Czw	3 luty	Św. Piotra i Pawła	Śro	29 czerwiec
Środa Popielcowa	Śro	9 luty	Wniebowzięcia N.M.P.	Pon	15 sierpień
Walentynki	Pon	14 luty	Święto Wojska Polskiego	Pon	15 sierpień
Święto UMK	Sob	19 luty	Dzień Solidarności i Wolności	Śro	31 sierpień
Dzień Kobiet	Wto	8 marzec	Dzień Programisty	Wto	13 wrzesień
Niedziela Palmowa	Nie	20 marzec	Dożynki – Święto Plonów	Pią	23 wrzesień
Narodowy Dzień Życia	Czw	24 marzec	Dzień Edukacji Narodowej	Pią	14 październik
Niedziela Wielkanocna	Nie	27 marzec	Dzień Papieski	Nie	16 październik
Niedziela Miłosierdzia Bożego	Nie	3 kwiecień	Dzień Papieża Jana Pawła II	Nie	16 październik
Święto Pracy	Nie	1 maj	Wszystkich Świętych	Wto	1 listopad
Dzień Flagi Rzeczypospolitej Polskiej	Pon	2 maj	Zaduszki	Śro	2 listopad
Najświętsza Maryja Królowa Polski	Wto	3 maj	Święto Niepodległości	Pią	11 listopad
Święto Konstytucji 3 Maja	Wto	3 maj	Pierwsza niedziela Adwentu	Nie	27 listopad
Wniebowstąpienia Pańskiego	Czw	5 maj	Niepokalane Poczęcie N.M.P.	Czw	8 grudzień
Zesłania Ducha Świętego	Nie	15 maj	Boże Narodzenie	Nie	25 grudzień
Dzień Polskiej Niezapominajki	Nie	15 maj	Sylwester	Sob	31 grudzień

Kalendarz astronomiczny 2006

PIWNICE, CA UMK

Współrzędne geograficzne: 18.5641°E 53.0955°N, Nr strefy czasowej (> 0 , gdy na wschód) = 1 (CSE)

Kalendarz jest gregoriańskim i jest oparty na efemerydach Układu Słonecznego obliczanych z dokładnością 1' (Słońce 2'', Księżyc 10'', Pluton 15'). Czas gwiazdowy ma dokładność około 0.1 s. Wschody i zachody obliczono z uwzględnieniem horyzontalnej refrakcji astronomicznej (34'), rozciągłości Słońca lub Księżyca i paralaksy horyzontalnej Księżyca. Dla dat odległych o więcej niż ok. 300 lat od roku 1950 dokładności położenia planet są gorsze niż 1'!
(Kalendarz ten opracowano [KMB] w Katedrze Radioastronomii CA UMK, Toruń—Piwnice. Oblicz. dnia 7.10.2010 r.)

Data Wielkanocy: **2006 KWIECIEŃ 16**

Dla całego roku przyjęto: TDT – UT = 65 s

Pory roku [miesiąc dzień, godz. mm] (czas zimowy): Wiosna **III 20, 19.25**, Lato **VI 21, 13.26**, Jesień **IX 23, 5.04**, Zima **XII 22, 1.22**

Dane w czasie letnim odróżniono kolorem brązowym; czas ten obowiązuje **od 26 marca do 29 października 2006 r.**

Oznaczenia:

Dr — dzień 2006 roku (1 stycznia Dr = 1)

Dm — dzień miesiąca

Dt — dzień tygodnia

JD — data juliańska modulo 1000 o 12^h UT

(po nagłówku: Entier(JD/1000) dla Dm = 1)

ST — prawdziwy czas gwiazdowy

$\Delta\alpha$ — różnica czasu (czas słoneczny prawdziwy minus średni)

α — rektascensja (Słońca lub Księżyca)

δ — deklinacja (Słońca lub Księżyca)

R — odległość (Słońca lub Księżyca)

j astr — jednostka astronomiczna

ρ_{\oplus} — promień Ziemi

Faza \leftarrow dni po kwadrze i % oświetlonej części tarczy Księżyca

Wsch — wschód (Słońca, Księżyca lub planety)

Gór — górowanie czyli tranzyt (Gal. = centrum Galaktyki)

Zach — zachód (Słońca, Księżyca lub planety)

STYCZEŃ 2006

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)											Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°/′	j astr	h.mmss	°/′	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2453																			
1	1	Nie	737	18.58051	-3.30	18.4722	-22.60	0.98334	20.0944	-24.54	56.747	1.3	3	800	1149.3	1539	943	1314.8	1656	1048	1	
2	2	Pon	738	19.02017	-3.59	18.5147	-22.54	0.98333	21.1125	-20.29	56.748	2.3	8	800	1149.7	1540	1009	1414.6	1834	1044	2	
3	3	Wto	739	19.05583	-4.26	18.5611	-22.49	0.98333	22.0853	-14.50	56.980	3.3	15	759	1150.2	1541	1026	1509.7	2009	1040	3	
4	4	Śro	740	19.09548	-4.54	19.0035	-22.43	0.98332	23.0230	-8.26	57.401	4.3	25	759	1150.6	1542	1039	1600.6	2140	1036	4	
5	5	Czw	741	19.13514	-5.21	19.0459	-22.36	0.98333	23.5322	-1.43	57.958	5.3	35	759	1151.1	1544	1049	1648.7	2307	1032	5	
6	6	Pią	742	19.17479	-5.47	19.0922	-22.29	0.98333	0.4247	4.56	58.595	6.3	46	758	1151.5	1545	1059	1735.5	****	1028	6	
7	7	Sob	743	19.21445	-6.14	19.1344	-22.22	0.98334	1.3201	11.13	59.264	0.7	57	758	1152.0	1546	1110	1822.5	032	1024	7	
8	8	Nie	744	19.25410	-6.39	19.1806	-22.14	0.98336	2.2212	16.51	59.927	1.7	68	757	1152.4	1548	1122	1910.7	157	1020	8	
9	9	Pon	745	19.29376	-7.04	19.2228	-22.05	0.98338	3.1407	21.36	60.561	2.7	77	757	1152.8	1549	1138	2001.0	322	1017	9	
10	10	Wto	746	19.33342	-7.29	19.2649	-21.57	0.98341	4.0807	25.14	61.151	3.7	85	756	1153.2	1551	1200	2053.6	446	1013	10	
11	11	Śro	747	19.37307	-7.52	19.3109	-21.47	0.98344	5.0351	27.32	61.693	4.7	92	755	1153.6	1552	1232	2147.8	604	1009	11	
12	12	Czw	748	19.41273	-8.16	19.3529	-21.38	0.98348	6.0021	28.24	62.183	5.7	96	755	1154.0	1554	1319	2242.3	711	1005	12	
13	13	Pią	749	19.45238	-8.38	19.3948	-21.28	0.98353	6.5615	27.49	62.620	6.7	99	754	1154.4	1555	1420	2335.3	802	1001	13	
14	14	Sob	750	19.49204	-9.00	19.4407	-21.17	0.98358	7.5013	25.54	62.997	0.0	100	753	1154.8	1557	1531	****	837	957	14	
15	15	Nie	751	19.53170	-9.22	19.4825	-21.06	0.98364	8.4123	22.48	63.303	1.0	99	752	1155.1	1558	1647	025.8	901	953	15	
16	16	Pon	752	19.57135	-9.42	19.5242	-20.55	0.98370	9.2931	18.47	63.520	2.0	96	751	1155.5	1600	1804	112.8	918	949	16	
17	17	Wto	753	20.01101	-10.02	19.5659	-20.43	0.98377	10.1454	14.03	63.629	3.0	92	750	1155.8	1602	1918	156.7	930	945	17	
18	18	Śro	754	20.05066	-10.22	20.0115	-20.31	0.98385	10.5813	8.51	63.605	4.0	86	749	1156.1	1604	2030	238.0	939	941	18	
19	19	Czw	755	20.09032	-10.40	20.0530	-20.19	0.98393	11.4019	3.19	63.428	5.0	79	748	1156.4	1605	2142	317.5	948	937	19	
20	20	Pią	756	20.12597	-10.58	20.0944	-20.06	0.98402	12.2212	-2.21	63.082	6.0	71	747	1156.7	1607	2254	356.5	955	933	20	
21	21	Sob	757	20.16563	-11.15	20.1358	-19.53	0.98412	13.0456	-8.00	62.560	7.0	61	746	1157.0	1609	****	435.9	1003	929	21	
22	22	Nie	758	20.20529	-11.32	20.1811	-19.39	0.98422	13.4941	-13.29	61.869	8.0	52	744	1157.3	1611	008	517.2	1013	925	22	
23	23	Pon	759	20.24494	-11.48	20.2223	-19.25	0.98432	14.3737	-18.33	61.032	0.8	42	743	1157.5	1612	126	601.5	1025	922	23	
24	24	Wto	760	20.28460	-12.02	20.2635	-19.11	0.98443	15.2949	-22.57	60.089	1.8	32	742	1157.8	1614	249	650.3	1042	918	24	
25	25	Śro	761	20.32425	-12.17	20.3045	-18.56	0.98454	16.2659	-26.18	59.099	2.8	22	741	1158.0	1616	414	744.5	1107	914	25	
26	26	Czw	762	20.36391	-12.30	20.3455	-18.41	0.98465	17.2855	-28.12	58.135	3.8	14	739	1158.2	1618	537	844.2	1148	910	26	
27	27	Pią	763	20.40356	-12.42	20.3904	-18.26	0.98477	18.3409	-28.18	57.281	4.8	7	738	1158.5	1620	646	947.9	1251	906	27	
28	28	Sob	764	20.44322	-12.54	20.4313	-18.10	0.98490	19.4009	-26.24	56.617	5.8	2	736	1158.7	1622	736	1052.8	1417	902	28	
29	29	Nie	765	20.48288	-13.05	20.4720	-17.54	0.98502	20.4417	-22.36	56.209	6.8	0	735	1158.8	1624	808	1155.7	1555	858	29	
30	30	Pon	766	20.52253	-13.15	20.5127	-17.38	0.98515	21.4455	-17.15	56.097	0.9	1	733	1159.0	1626	829	1254.6	1735	854	30	
31	31	Wto	767	20.56219	-13.25	20.5533	-17.21	0.98528	22.4142	-10.51	56.283	1.9	5	731	1159.2	1627	844	1349.2	1912	850	31	

Fazy Księżyca [Dm, h.mm]: Nów 0, 4.12 1kw 6, 19.57 Pełn 14, 10.48 3kw 22, 16.14 Nów 29, 15.15

STYCZEŃ 2006 (c.d.)

Świty, zmierny astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach		
1	5.51	17.48	7.05	14.29	8.46	17.32	11.57	3.15	3.07	12.29	18.02	9.42	10.28	20.53	9.44	18.49	6.07	15.17		
	18.789	-22.99	17.734	-23.61	20.118	-17.74	2.551	16.67	14.751	-14.81	8.834	18.38	22.647	-9.36	21.235	-16.19	17.652	-15.78	6.70042	1
3	5.51	17.50	7.12	14.32	8.33	17.23	11.50	3.11	3.01	12.22	17.53	9.34	10.21	20.46	9.36	18.41	5.59	15.09		
	18.936	-22.81	17.953	-23.89	20.060	-17.38	2.585	16.85	14.772	-14.90	8.825	18.42	22.651	-9.33	21.239	-16.17	17.657	-15.78	6.83184	3
5	5.51	17.52	7.19	14.36	8.19	17.13	11.43	3.06	2.55	12.15	17.45	9.26	10.13	20.38	9.28	18.34	5.52	15.02		
	19.083	-22.60	18.174	-24.09	19.992	-17.05	2.620	17.05	14.792	-14.99	8.816	18.46	22.656	-9.30	21.244	-16.15	17.662	-15.79	6.96326	5
7	5.51	17.55	7.25	14.40	8.05	17.03	11.36	3.02	2.49	12.08	17.36	9.18	10.05	20.31	9.20	18.26	5.44	14.54		
	19.229	-22.36	18.398	-24.21	19.917	-16.74	2.658	17.25	14.812	-15.07	8.806	18.50	22.661	-9.27	21.248	-16.13	17.667	-15.79	7.09468	7
9	5.50	17.57	7.31	14.46	7.50	16.52	11.30	2.58	2.43	12.00	17.27	9.10	9.57	20.23	9.13	18.19	5.37	14.46		
	19.374	-22.09	18.624	-24.25	19.835	-16.46	2.699	17.45	14.832	-15.16	8.796	18.54	22.666	-9.24	21.253	-16.11	17.672	-15.79	7.22610	9
11	5.49	17.59	7.37	14.52	7.36	16.40	11.23	2.54	2.36	11.53	17.18	9.02	9.50	20.16	9.05	18.11	5.29	14.39		
	19.519	-21.79	18.852	-24.19	19.749	-16.21	2.741	17.66	14.851	-15.24	8.786	18.59	22.672	-9.21	21.257	-16.09	17.676	-15.80	7.35752	11
13	5.48	18.02	7.41	14.59	7.21	16.28	11.16	2.50	2.30	11.46	17.10	8.53	9.42	20.09	8.57	18.04	5.21	14.31		
	19.663	-21.46	19.081	-24.05	19.660	-15.99	2.785	17.88	14.870	-15.31	8.776	18.63	22.677	-9.17	21.262	-16.07	17.681	-15.80	7.48895	13
15	5.47	18.04	7.46	15.07	7.07	16.16	11.10	2.46	2.24	11.39	17.01	8.45	9.34	20.01	8.50	17.56	5.14	14.24		
	19.807	-21.11	19.312	-23.81	19.572	-15.80	2.832	18.10	14.888	-15.39	8.766	18.68	22.683	-9.14	21.267	-16.05	17.686	-15.80	7.62037	15
17	5.46	18.07	7.49	15.15	6.53	16.04	11.03	2.43	2.17	11.31	16.52	8.37	9.26	19.54	8.42	17.49	5.06	14.16		
	19.950	-20.72	19.545	-23.48	19.487	-15.65	2.880	18.32	14.905	-15.46	8.755	18.72	22.689	-9.10	21.272	-16.02	17.690	-15.80	7.75179	17
19	5.44	18.10	7.52	15.24	6.39	15.53	10.57	2.39	2.11	11.24	16.43	8.29	9.19	19.47	8.34	17.42	4.59	14.08		
	20.092	-20.31	19.778	-23.05	19.406	-15.52	2.929	18.55	14.922	-15.53	8.744	18.77	22.694	-9.07	21.276	-16.00	17.695	-15.80	7.88321	19
21	5.43	18.13	7.54	15.34	6.26	15.41	10.50	2.36	2.05	11.17	16.34	8.21	9.11	19.39	8.26	17.34	4.51	14.01		
	20.233	-19.88	20.012	-22.52	19.332	-15.43	2.981	18.78	14.938	-15.59	8.733	18.81	22.700	-9.03	21.281	-15.98	17.699	-15.80	8.01463	21
23	5.41	18.16	7.56	15.45	6.14	15.29	10.44	2.33	1.58	11.10	16.26	8.12	9.03	19.32	8.19	17.27	4.43	13.53		
	20.373	-19.42	20.246	-21.90	19.267	-15.37	3.034	19.01	14.954	-15.65	8.722	18.86	22.707	-8.99	21.286	-15.96	17.704	-15.80	8.14605	23
25	5.39	18.19	7.57	15.57	6.03	15.18	10.38	2.30	1.51	11.02	16.17	8.04	8.56	19.25	8.11	17.19	4.36	13.46		
	20.513	-18.94	20.481	-21.17	19.212	-15.33	3.088	19.24	14.969	-15.71	8.711	18.91	22.713	-8.96	21.291	-15.94	17.708	-15.80	8.27747	25
27	5.37	18.22	7.57	16.08	5.52	15.08	10.32	2.27	1.45	10.55	16.08	7.56	8.48	19.18	8.03	17.12	4.28	13.38		
	20.651	-18.43	20.716	-20.34	19.167	-15.33	3.144	19.47	14.983	-15.77	8.700	18.95	22.719	-8.92	21.296	-15.91	17.712	-15.80	8.40889	27
29	5.34	18.25	7.57	16.21	5.43	14.58	10.26	2.24	1.38	10.48	15.59	7.48	8.40	19.10	7.56	17.04	4.21	13.30		
	20.789	-17.90	20.951	-19.41	19.134	-15.35	3.202	19.71	14.997	-15.82	8.689	19.00	22.725	-8.88	21.301	-15.89	17.716	-15.80	8.54032	29
31	5.32	18.28	7.57	16.34	5.34	14.49	10.20	2.22	1.31	10.40	15.50	7.40	8.33	19.03	7.48	16.57	4.13	13.23		
	20.926	-17.35	21.185	-18.38	19.112	-15.39	3.261	19.94	15.010	-15.87	8.678	19.04	22.732	-8.84	21.306	-15.87	17.720	-15.80	8.67174	31

LUTY 2006

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]									
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2453																			
32	1	Śro	768	21.00184	-13.33	20.5938	-17.04	0.98542	23.3518	-3.55	56.739	2.9	12	730	1159.3	1629	856	1440.4	2044	846	1	
33	2	Czw	769	21.04150	-13.41	21.0342	-16.47	0.98556	0.2653	3.05	57.407	3.9	21	728	1159.4	1631	906	1529.5	2214	842	2	
34	3	Pią	770	21.08115	-13.48	21.0745	-16.29	0.98570	1.1741	9.44	58.214	4.9	31	726	1159.5	1633	917	1617.9	2342	838	3	
35	4	Sob	771	21.12081	-13.54	21.1148	-16.12	0.98585	2.0851	15.44	59.087	5.9	41	725	1159.6	1635	928	1707.0	****	834	4	
36	5	Nie	772	21.16047	-13.59	21.1550	-15.54	0.98600	3.0114	20.48	59.960	0.2	52	723	1159.7	1637	943	1757.5	109	830	5	
37	6	Pon	773	21.20012	-14.03	21.1951	-15.35	0.98615	3.5515	24.43	60.782	1.2	62	721	1159.8	1639	1003	1849.8	235	826	6	
38	7	Wto	774	21.23578	-14.07	21.2351	-15.16	0.98631	4.5045	27.19	61.518	2.2	72	719	1159.9	1641	1032	1943.6	356	823	7	
39	8	Śro	775	21.27543	-14.09	21.2750	-14.58	0.98647	5.4658	28.29	62.150	3.2	80	718	1159.9	1643	1114	2037.8	506	819	8	
40	9	Czw	776	21.31509	-14.11	21.3148	-14.38	0.98664	6.4243	28.13	62.670	4.2	88	716	1159.9	1645	1210	2131.0	601	815	9	
41	10	Pią	777	21.35475	-14.12	21.3546	-14.19	0.98681	7.3648	26.34	63.080	5.2	93	714	1160.0	1647	1319	2221.9	641	811	10	
42	11	Sob	778	21.39440	-14.13	21.3943	-13.59	0.98699	8.2820	23.44	63.384	6.2	97	712	1160.0	1649	1434	2309.8	707	807	11	
43	12	Nie	779	21.43406	-14.12	21.4339	-13.40	0.98717	9.1659	19.55	63.588	7.2	100	710	1160.0	1651	1550	2354.5	725	803	12	
44	13	Pon	780	21.47371	-14.11	21.4734	-13.19	0.98736	10.0256	15.19	63.694	0.3	100	708	1159.9	1653	1705	*****	738	759	13	
45	14	Wto	781	21.51337	-14.09	21.5129	-12.59	0.98755	10.4642	10.11	63.702	1.3	99	706	1159.9	1655	1819	036.5	748	755	14	
46	15	Śro	782	21.55302	-14.06	21.5523	-12.39	0.98775	11.2902	4.41	63.603	2.3	96	704	1159.9	1657	1931	116.5	757	751	15	
47	16	Czw	783	21.59268	-14.03	21.5916	-12.18	0.98796	12.1051	-0.60	63.389	3.3	91	702	1159.8	1659	2042	155.6	804	747	16	
48	17	Pią	784	22.03233	-13.59	22.0308	-11.57	0.98816	12.5305	-6.41	63.047	4.3	85	700	1159.7	1701	2155	234.6	812	743	17	
49	18	Sob	785	22.07199	-13.54	22.0700	-11.36	0.98838	13.3645	-12.11	62.569	5.3	77	658	1159.6	1702	2311	314.7	820	739	18	
50	19	Nie	786	22.11164	-13.49	22.1051	-11.15	0.98859	14.2256	-17.20	61.952	6.3	68	656	1159.6	1704	****	357.2	831	735	19	
51	20	Pon	787	22.15130	-13.43	22.1442	-10.53	0.98881	15.1237	-21.52	61.203	7.3	59	653	1159.5	1706	030	443.1	845	731	20	
52	21	Wto	788	22.19095	-13.36	22.1832	-10.31	0.98904	16.0635	-25.29	60.344	0.2	48	651	1159.3	1708	153	533.6	906	727	21	
53	22	Śro	789	22.23061	-13.29	22.2221	-10.10	0.98926	17.0501	-27.52	59.411	1.2	38	649	1159.2	1710	315	629.1	938	724	22	
54	23	Czw	790	22.27027	-13.21	22.2609	-9.48	0.98949	18.0710	-28.39	58.461	2.2	27	647	1159.1	1712	429	729.0	1028	720	23	
55	24	Pią	791	22.30592	-13.12	22.2957	-9.26	0.98972	19.1117	-27.36	57.565	3.2	18	645	1158.9	1714	526	831.6	1141	716	24	
56	25	Sob	792	22.34558	-13.03	22.3345	-9.03	0.98996	20.1504	-24.39	56.803	4.2	10	643	1158.8	1716	605	934.2	1313	712	25	
57	26	Nie	793	22.38523	-12.53	22.3732	-8.41	0.99019	21.1639	-19.59	56.253	5.2	4	640	1158.6	1718	631	1034.5	1452	708	26	
58	27	Pon	794	22.42489	-12.43	22.4118	-8.18	0.99043	22.1510	-13.58	55.978	6.2	0	638	1158.5	1720	648	1131.4	1631	704	27	
59	28	Wto	795	22.46454	-12.32	22.4504	-7.56	0.99067	23.1047	-7.05	56.012	0.4	0	636	1158.3	1722	701	1224.9	1808	700	28	

Fazy Księżyca [Dm, h.mm]: 1kw 5, 7.29 Pełn 13, 5.44 3kw 21, 8.17 Now 28, 1.31

LUTY 2006 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	5.30	18.30	7.56	16.40	5.30	14.44	10.17	2.20	1.28	10.36	15.46	7.35	8.29	18.59	7.44	16.53	4.09	13.19		
	20.994	-17.07	21.302	-17.83	19.105	-15.42	3.291	20.06	15.016	-15.90	8.672	19.07	22.735	-8.82	21.309	-15.86	17.722	-15.80	8.73745	1
3	5.28	18.33	7.55	16.54	5.22	14.35	10.11	2.18	1.21	10.29	15.37	7.27	8.21	18.52	7.36	16.46	4.01	13.11		
	21.129	-16.49	21.535	-16.65	19.101	-15.49	3.352	20.29	15.028	-15.94	8.661	19.11	22.742	-8.78	21.314	-15.83	17.726	-15.80	8.86886	3
5	5.25	18.37	7.53	17.08	5.15	14.28	10.05	2.15	1.14	10.22	15.28	7.19	8.13	18.45	7.29	16.38	3.54	13.04		
	21.264	-15.89	21.766	-15.38	19.107	-15.57	3.414	20.52	15.040	-15.98	8.650	19.15	22.749	-8.74	21.319	-15.81	17.729	-15.80	9.00028	5
7	5.22	18.40	7.50	17.22	5.09	14.20	9.60	2.13	1.07	10.14	15.19	7.11	8.06	18.38	7.21	16.31	3.46	12.56		
	21.397	-15.27	21.995	-14.02	19.125	-15.67	3.477	20.75	15.050	-16.02	8.640	19.20	22.755	-8.70	21.324	-15.79	17.733	-15.80	9.13170	7
9	5.18	18.43	7.48	17.36	5.03	14.13	9.54	2.10	0.60	10.07	15.11	7.03	7.58	18.30	7.13	16.24	3.38	12.48		
	21.530	-14.64	22.221	-12.57	19.152	-15.76	3.542	20.98	15.060	-16.06	8.629	19.24	22.762	-8.66	21.329	-15.77	17.736	-15.79	9.26313	9
11	5.15	18.47	7.44	17.50	4.58	14.07	9.48	2.08	0.53	9.59	15.02	6.54	7.50	18.23	7.06	16.16	3.31	12.41		
	21.662	-13.99	22.442	-11.05	19.190	-15.86	3.607	21.20	15.069	-16.09	8.618	19.28	22.769	-8.61	21.334	-15.74	17.740	-15.79	9.39455	11
13	5.12	18.50	7.40	18.04	4.54	14.01	9.43	2.06	0.46	9.52	14.53	6.46	7.43	18.16	6.58	16.09	3.23	12.33		
	21.793	-13.32	22.656	-9.48	19.237	-15.96	3.674	21.43	15.078	-16.12	8.608	19.32	22.776	-8.57	21.339	-15.72	17.743	-15.79	9.52597	13
15	5.08	18.54	7.36	18.17	4.50	13.56	9.37	2.04	0.38	9.44	14.44	6.38	7.35	18.09	6.50	16.01	3.15	12.25		
	21.923	-12.64	22.861	-7.87	19.292	-16.05	3.742	21.65	15.085	-16.14	8.598	19.36	22.783	-8.53	21.344	-15.70	17.746	-15.79	9.65738	15
17	5.04	18.57	7.31	18.30	4.46	13.52	9.32	2.01	0.31	9.36	14.36	6.30	7.27	18.02	6.42	15.54	3.08	12.18		
	22.052	-11.95	23.055	-6.26	19.356	-16.13	3.811	21.86	15.092	-16.17	8.588	19.40	22.790	-8.49	21.349	-15.68	17.749	-15.78	9.78880	17
19	5.00	19.01	7.25	18.41	4.43	13.48	9.27	1.59	0.24	9.29	14.27	6.22	7.20	17.54	6.35	15.46	3.00	12.10		
	22.181	-11.24	23.233	-4.67	19.427	-16.20	3.880	22.07	15.098	-16.18	8.578	19.44	22.797	-8.44	21.354	-15.65	17.752	-15.78	9.92022	19
21	4.56	19.04	7.19	18.51	4.40	13.44	9.22	1.57	0.16	9.21	14.18	6.13	7.12	17.47	6.27	15.39	2.52	12.02		
	22.309	-10.52	23.391	-3.16	19.505	-16.26	3.951	22.28	15.103	-16.20	8.569	19.48	22.804	-8.40	21.359	-15.63	17.755	-15.78	10.05164	21
23	4.52	19.08	7.11	18.58	4.37	13.41	9.17	1.55	0.09	9.14	14.09	6.05	7.04	17.40	6.19	15.32	2.45	11.55		
	22.436	-9.79	23.524	-1.78	19.590	-16.29	4.022	22.48	15.108	-16.21	8.559	19.51	22.811	-8.36	21.363	-15.61	17.757	-15.77	10.18306	23
25	4.48	19.12	7.03	19.03	4.35	13.39	9.12	1.53	23.57	9.06	14.01	5.57	6.56	17.33	6.12	15.24	2.37	11.47		
	22.562	-9.05	23.628	-0.57	19.680	-16.31	4.095	22.67	15.111	-16.22	8.550	19.55	22.818	-8.31	21.368	-15.59	17.760	-15.77	10.31448	25
27	4.44	19.16	6.54	19.04	4.33	13.37	9.07	1.51	23.50	8.58	13.52	5.49	6.49	17.26	6.04	15.17	2.29	11.39		
	22.688	-8.31	23.698	0.42	19.776	-16.31	4.168	22.86	15.114	-16.23	8.542	19.58	22.826	-8.27	21.373	-15.56	17.762	-15.77	10.44590	27

MARZEC 2006

Piwnice, CA UMK			← Dane na godz. 12 czasu strefowego (= 11 lub 10 ^h UT) →											Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2453																			
60	1	Śro	796	22.50420	-12.21	22.4849	-7.33	0.99091	0.0420	0.08	56.353	1.4	3	634	1158.1	1724	712	1316.3	1941	656	1	
61	2	Czw	797	22.54385	-12.09	22.5234	-7.10	0.99115	0.5657	7.13	56.963	2.4	9	631	1157.9	1725	723	1406.6	2113	652	2	
62	3	Pią	798	22.58351	-11.57	22.5618	-6.47	0.99139	1.4943	13.45	57.778	3.4	16	629	1157.7	1727	734	1457.2	2245	648	3	
63	4	Sob	799	23.02316	-11.44	23.0002	-6.24	0.99163	2.4329	19.23	58.717	4.4	26	627	1157.5	1729	747	1549.1	****	644	4	
64	5	Nie	800	23.06282	-11.31	23.0345	-6.01	0.99188	3.3843	23.50	59.697	5.4	36	624	1157.3	1731	806	1642.5	015	640	5	
65	6	Pon	801	23.10247	-11.17	23.0728	-5.38	0.99213	4.3517	26.54	60.647	6.4	46	622	1157.0	1733	832	1737.4	141	636	6	
66	7	Wto	802	23.14213	-11.03	23.1110	-5.14	0.99238	5.3225	28.28	61.508	0.6	56	620	1156.8	1735	909	1832.5	258	632	7	
67	8	Śro	803	23.18179	-10.48	23.1452	-4.51	0.99263	6.2858	28.33	62.243	1.6	66	617	1156.5	1737	1001	1926.7	359	629	8	
68	9	Czw	804	23.22144	-10.33	23.1834	-4.27	0.99288	7.2344	27.12	62.829	2.6	75	615	1156.3	1739	1107	2018.5	443	625	9	
69	10	Pią	805	23.26110	-10.18	23.2215	-4.04	0.99314	8.1552	24.38	63.259	3.6	83	613	1156.0	1740	1221	2107.2	513	621	10	
70	11	Sob	806	23.30075	-10.02	23.2556	-3.40	0.99340	9.0503	21.01	63.538	4.6	89	610	1155.8	1742	1338	2152.7	533	617	11	
71	12	Nie	807	23.34041	-9.46	23.2936	-3.17	0.99366	9.5127	16.36	63.676	5.6	94	608	1155.5	1744	1453	2235.4	547	613	12	
72	13	Pon	808	23.38006	-9.30	23.3317	-2.53	0.99393	10.3537	11.33	63.690	6.6	98	606	1155.2	1746	1607	2315.9	558	609	13	
73	14	Wto	809	23.41572	-9.13	23.3657	-2.30	0.99420	11.1816	6.06	63.594	7.6	100	603	1155.0	1748	1719	2355.2	607	605	14	
74	15	Śro	810	23.45537	-8.57	23.4036	-2.06	0.99447	12.0014	0.25	63.401	0.5	100	601	1154.7	1750	1831	*****	614	601	15	
75	16	Czw	811	23.49503	-8.39	23.4416	-1.42	0.99474	12.4228	-5.19	63.117	1.5	98	558	1154.4	1751	1944	034.4	622	557	16	
76	17	Pią	812	23.53468	-8.22	23.4755	-1.19	0.99502	13.2552	-10.56	62.747	2.5	94	556	1154.1	1753	2100	114.2	630	553	17	
77	18	Sob	813	23.57434	-8.05	23.5134	-0.55	0.99530	14.1125	-16.12	62.289	3.5	89	554	1153.8	1755	2218	156.0	639	549	18	
78	19	Nie	814	0.01399	-7.47	23.5513	-0.31	0.99559	15.0000	-20.54	61.742	4.5	82	551	1153.5	1757	2339	240.6	652	545	19	
79	20	Pon	815	0.05365	-7.29	23.5852	-0.07	0.99587	15.5219	-24.45	61.108	5.5	74	549	1153.2	1759	****	329.1	710	541	20	
80	21	Wto	816	0.09331	-7.12	0.0231	0.16	0.99616	16.4834	-27.26	60.395	6.5	64	546	1152.9	1800	101	422.0	737	537	21	
81	22	Śro	817	0.13296	-6.54	0.0610	0.40	0.99644	17.4814	-28.40	59.621	7.5	54	544	1152.6	1802	217	519.0	819	533	22	
82	23	Czw	818	0.17262	-6.36	0.0948	1.04	0.99673	18.4958	-28.13	58.818	0.7	43	542	1152.3	1804	319	618.8	921	530	23	
83	24	Pią	819	0.21227	-6.18	0.1327	1.27	0.99702	19.5153	-25.60	58.033	1.7	32	539	1152.0	1806	403	719.3	1043	526	24	
84	25	Sob	820	0.25193	-5.60	0.1705	1.51	0.99731	20.5218	-22.05	57.326	2.7	22	537	1151.7	1808	432	818.5	1216	522	25	
85	26	Nie	821	0.29158	-5.42	0.2044	2.15	0.99760	21.5018	-16.44	56.764	3.7	13	534	1151.4	1809	452	915.0	1353	518	26	
85	26	Nie	821	23.29060	-5.42	0.2034	2.14	0.99759	21.4756	-16.59	56.784	4.7	13	634	1251.5	1910	552	1015.0	1453	618	26	
86	27	Pon	822	23.33025	-5.24	0.2413	2.37	0.99787	22.4334	-10.35	56.421	5.7	6	632	1251.1	1911	606	1108.8	1628	614	27	
87	28	Wto	823	23.36591	-5.06	0.2751	3.01	0.99816	23.3722	-3.33	56.314	6.7	2	630	1250.8	1913	618	1200.4	1802	610	28	
88	29	Śro	824	23.40556	-4.48	0.3130	3.24	0.99845	0.3019	3.41	56.489	7.7	0	627	1250.5	1915	629	1251.2	1936	606	29	
89	30	Czw	825	23.44522	-4.30	0.3508	3.47	0.99873	1.2331	10.38	56.939	1.0	1	625	1250.2	1917	639	1342.2	2109	602	30	
90	31	Pią	826	23.48487	-4.12	0.3847	4.11	0.99902	2.1755	16.53	57.623	2.0	6	623	1249.9	1919	652	1434.6	2242	558	31	

Fazy Księżyca [Dm, h.mm]: 1kw 6, 21.16 Pełn 15, 0.35 3kw 22, 20.10 Nów 29, 12.15

MARZEC 2006 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE			MERCURY			WENUS			MARS			JOWISZ			SATURN			URAN			NEPTUN			PLUTON			ST (0^h UT) Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch			
1	4.39	19.19	6.45	19.02	4.31	13.35	9.02	1.49	23.42	8.50	13.44	5.41	6.41	17.18	5.56	15.09	2.21	11.32										
	22.814	-7.55	23.732	1.14	19.877	-16.28	4.242	23.05	15.116	-16.23	8.534	19.61	22.833	-8.22	21.378	-15.54	17.764	-15.76	10.57732	1								
3	4.34	19.23	6.34	18.57	4.29	13.34	8.57	1.47	23.34	8.43	13.35	5.33	6.33	17.11	5.49	15.02	2.14	11.24										
	22.938	-6.78	23.729	1.55	19.982	-16.23	4.317	23.23	15.117	-16.23	8.526	19.64	22.840	-8.18	21.382	-15.52	17.766	-15.76	10.70874	3								
5	4.30	19.27	6.24	18.47	4.27	13.33	8.52	1.45	23.26	8.35	13.27	5.24	6.26	17.04	5.41	14.54	2.06	11.16										
	23.062	-6.01	23.690	1.65	20.091	-16.15	4.392	23.40	15.117	-16.22	8.518	19.67	22.847	-8.14	21.387	-15.50	17.768	-15.75	10.84015	5								
7	4.25	19.31	6.13	18.34	4.25	13.32	8.48	1.43	23.18	8.27	13.18	5.16	6.18	16.57	5.33	14.47	1.58	11.08										
	23.186	-5.24	23.620	1.42	20.204	-16.04	4.469	23.56	15.117	-16.21	8.511	19.69	22.854	-8.09	21.392	-15.48	17.770	-15.75	10.97157	7								
9	4.20	19.35	6.02	18.17	4.24	13.32	8.43	1.41	23.10	8.19	13.10	5.08	6.10	16.50	5.25	14.39	1.50	11.01										
	23.309	-4.46	23.526	0.90	20.320	-15.91	4.546	23.72	15.115	-16.20	8.505	19.72	22.861	-8.05	21.396	-15.46	17.771	-15.75	11.10300	9								
11	4.15	19.39	5.52	17.59	4.22	13.32	8.39	1.39	23.02	8.11	13.01	5.00	6.03	16.42	5.18	14.32	1.42	10.53										
	23.432	-3.67	23.416	0.14	20.439	-15.74	4.623	23.87	15.113	-16.19	8.498	19.74	22.868	-8.01	21.401	-15.44	17.773	-15.74	11.23442	11								
13	4.10	19.43	5.42	17.39	4.20	13.33	8.34	1.37	22.54	8.03	12.53	4.52	5.55	16.35	5.10	14.24	1.35	10.45										
	23.555	-2.89	23.302	-0.80	20.561	-15.55	4.702	24.01	15.110	-16.17	8.493	19.76	22.876	-7.96	21.405	-15.42	17.774	-15.74	11.36584	13								
15	4.05	19.47	5.33	17.19	4.18	13.34	8.30	1.35	22.46	7.55	12.45	4.44	5.47	16.28	5.02	14.17	1.27	10.37										
	23.677	-2.10	23.193	-1.82	20.685	-15.32	4.780	24.15	15.106	-16.15	8.487	19.78	22.883	-7.92	21.409	-15.40	17.775	-15.73	11.49725	15								
17	3.60	19.51	5.25	17.00	4.17	13.35	8.26	1.33	22.37	7.47	12.36	4.36	5.40	16.21	4.54	14.09	1.19	10.30										
	23.799	-1.31	23.098	-2.85	20.812	-15.06	4.860	24.28	15.101	-16.12	8.482	19.80	22.890	-7.88	21.413	-15.38	17.776	-15.73	11.62867	17								
19	3.54	19.56	5.18	16.43	4.15	13.37	8.22	1.31	22.29	7.39	12.28	4.28	5.32	16.14	4.47	14.02	1.11	10.22										
	23.920	-0.52	23.024	-3.81	20.940	-14.77	4.940	24.39	15.096	-16.09	8.478	19.82	22.896	-7.84	21.417	-15.36	17.777	-15.72	11.76008	19								
21	3.49	19.60	5.12	16.27	4.13	13.39	8.18	1.29	22.21	7.31	12.20	4.20	5.24	16.06	4.39	13.54	1.03	10.14										
	0.042	0.27	22.973	-4.66	21.071	-14.45	5.020	24.50	15.089	-16.06	8.474	19.83	22.903	-7.80	21.421	-15.34	17.778	-15.72	11.89151	21								
23	3.43	20.04	5.06	16.14	4.11	13.41	8.14	1.26	22.12	7.23	12.12	4.12	5.17	15.59	4.31	13.47	0.55	10.06										
	0.163	1.06	22.948	-5.37	21.202	-14.10	5.101	24.60	15.082	-16.03	8.471	19.85	22.910	-7.75	21.425	-15.32	17.778	-15.71	12.02293	23								
25	3.37	20.09	5.01	16.03	4.08	13.43	8.10	1.24	22.03	7.15	12.04	4.04	5.09	15.52	4.23	13.39	0.48	9.58										
	0.285	1.85	22.947	-5.92	21.336	-13.72	5.183	24.70	15.074	-15.99	8.468	19.86	22.917	-7.71	21.429	-15.31	17.779	-15.71	12.15435	25								
27	4.32	21.13	5.57	16.55	5.06	14.46	9.07	2.22	22.55	8.07	12.56	4.56	6.01	16.45	5.16	14.32	1.40	10.51										
	0.404	2.62	22.969	-6.30	21.467	-13.32	5.263	24.78	15.066	-15.95	8.465	19.87	22.923	-7.67	21.433	-15.29	17.779	-15.70	12.28576	27								
29	4.26	21.18	5.52	16.48	5.04	14.48	9.03	2.20	22.46	7.59	12.48	4.48	5.54	16.37	5.08	14.24	1.32	10.43										
	0.525	3.40	23.013	-6.52	21.602	-12.87	5.345	24.85	15.056	-15.91	8.463	19.88	22.930	-7.63	21.437	-15.27	17.779	-15.70	12.41718	29								
31	4.20	21.23	5.49	16.44	5.01	14.51	8.60	2.17	22.37	7.50	12.40	4.40	5.46	16.30	5.00	14.17	1.24	10.35										
	0.646	4.18	23.076	-6.58	21.738	-12.40	5.428	24.92	15.046	-15.86	8.462	19.88	22.937	-7.59	21.440	-15.26	17.779	-15.69	12.54860	31								

KWIECIEŃ 2006

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
2453																					
91	1	Sob	827	23.52453	-3.54	0.4226	4.34	0.99930	3.1402	22.03	58.479	3.0	12	620	1249.7	1920	708	1529.1	****	554	1
92	2	Nie	828	23.56418	-3.37	0.4605	4.57	0.99958	4.1152	25.51	59.428	4.0	20	618	1249.4	1922	731	1625.3	014	550	2
93	3	Pon	829	24.00384	-3.19	0.4944	5.20	0.99987	5.1038	28.05	60.392	5.0	29	615	1249.1	1924	804	1722.3	139	546	3
94	4	Wto	830	0.04349	-3.01	0.5323	5.43	1.00015	6.0901	28.42	61.300	6.0	39	613	1248.8	1926	851	1818.5	249	542	4
95	5	Śro	831	0.08315	-2.44	0.5702	6.06	1.00043	7.0535	27.49	62.094	7.0	49	611	1248.5	1927	954	1912.4	341	538	5
96	6	Czw	832	0.12281	-2.27	1.0041	6.28	1.00071	7.5919	25.36	62.734	0.9	59	608	1248.2	1929	1107	2002.8	416	534	6
97	7	Pią	833	0.16246	-2.10	1.0421	6.51	1.00099	8.4946	22.16	63.197	1.9	68	606	1247.9	1931	1223	2049.7	439	531	7
98	8	Sob	834	0.20212	-1.53	1.0801	7.14	1.00127	9.3705	18.04	63.478	2.9	77	604	1247.6	1933	1339	2133.3	455	527	8
99	9	Nie	835	0.24177	-1.37	1.1141	7.36	1.00155	10.2151	13.12	63.583	3.9	84	601	1247.4	1935	1454	2214.4	507	523	9
100	10	Pon	836	0.28143	-1.20	1.1521	7.58	1.00183	11.0452	7.52	63.529	4.9	90	559	1247.1	1936	1607	2254.0	516	519	10
101	11	Wto	837	0.32108	-1.04	1.1901	8.20	1.00211	11.4659	2.14	63.339	5.9	95	557	1246.8	1938	1719	2333.2	524	515	11
102	12	Śro	838	0.36074	-0.48	1.2242	8.42	1.00239	12.2912	-3.31	63.041	6.9	98	554	1246.6	1940	1832	*****	532	511	12
103	13	Czw	839	0.40039	-0.33	1.2623	9.04	1.00267	13.1226	-9.14	62.659	7.9	100	552	1246.3	1942	1946	012.9	539	507	13
104	14	Pią	840	0.44005	-0.18	1.3005	9.26	1.00296	13.5741	-14.40	62.215	0.7	99	550	1246.0	1944	2104	054.3	549	503	14
105	15	Sob	841	0.47570	-0.03	1.3346	9.47	1.00324	14.4548	-19.36	61.728	1.7	97	547	1245.8	1945	2226	138.4	600	459	15
106	16	Nie	842	0.51536	0.11	1.3728	10.09	1.00352	15.3729	-23.45	61.207	2.7	93	545	1245.6	1947	2349	226.2	616	455	16
107	17	Pon	843	0.55501	0.25	1.4111	10.30	1.00381	16.3257	-26.47	60.659	3.7	86	543	1245.3	1949	****	318.1	640	451	17
108	18	Wto	844	0.59467	0.39	1.4454	10.51	1.00409	17.3142	-28.26	60.091	4.7	78	541	1245.1	1951	107	413.9	717	447	18
109	19	Śro	845	1.03433	0.52	1.4837	11.12	1.00437	18.3227	-28.28	59.508	5.7	69	538	1244.9	1953	214	512.6	812	443	19
110	20	Czw	846	1.07398	1.05	1.5221	11.32	1.00465	19.3322	-26.47	58.924	6.7	58	536	1244.7	1954	303	612.1	927	439	20
111	21	Pią	847	1.11364	1.18	1.5605	11.53	1.00494	20.3250	-23.28	58.358	0.3	47	534	1244.5	1956	335	710.3	1055	436	21
112	22	Sob	848	1.15329	1.29	1.5950	12.13	1.00521	21.2951	-18.43	57.844	1.3	36	532	1244.3	1958	357	805.9	1228	432	22
113	23	Nie	849	1.19295	1.41	2.0335	12.33	1.00549	22.2423	-12.52	57.421	2.3	25	530	1244.1	2000	413	858.7	1400	428	23
114	24	Pon	850	1.23260	1.52	2.0720	12.53	1.00576	23.1701	-6.14	57.135	3.3	16	527	1243.9	2001	425	949.2	1532	424	24
115	25	Wto	851	1.27226	2.02	2.1106	13.13	1.00603	0.0845	0.46	57.028	4.3	8	525	1243.7	2003	435	1038.7	1702	420	25
116	26	Śro	852	1.31191	2.12	2.1453	13.32	1.00630	1.0044	7.44	57.132	5.3	3	523	1243.5	2005	446	1128.4	1834	416	26
117	27	Czw	853	1.35157	2.22	2.1840	13.51	1.00657	1.5404	14.16	57.457	6.3	0	521	1243.4	2007	457	1219.5	2006	412	27
118	28	Pią	854	1.39122	2.31	2.2228	14.10	1.00683	2.4931	19.56	57.991	0.6	0	519	1243.2	2009	511	1313.0	2140	408	28
119	29	Sob	855	1.43088	2.39	2.2616	14.29	1.00709	3.4719	24.22	58.697	1.6	3	517	1243.1	2010	531	1409.1	2310	404	29
120	30	Nie	856	1.47054	2.47	2.3004	14.48	1.00734	4.4653	27.17	59.518	2.6	8	515	1243.0	2012	559	1507.1	****	400	30

Fazy Księżyca [Dm, h.mm]: 1kw 5, 14.01 Pełn 13, 18.40 3kw 21, 5.28 Nów 27, 21.44

KWIECIEŃ 2006 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	
Dm	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	Dm
1	4.17	21.25	5.47	16.42	4.60	14.53	8.58	2.16	22.33	7.46	12.36	4.36	5.42	16.26	4.56	14.13	1.20	10.31		
	0.707	4.56	23.114	-6.55	21.807	-12.16	5.469	24.95	15.041	-15.84	8.461	19.88	22.940	-7.57	21.442	-15.25	17.779	-15.69	12.61430	1
3	4.11	21.30	5.44	16.41	4.57	14.56	8.55	2.14	22.24	7.38	12.28	4.28	5.34	16.19	4.49	14.05	1.12	10.23		
	0.829	5.33	23.203	-6.39	21.944	-11.64	5.553	25.00	15.030	-15.79	8.460	19.89	22.946	-7.54	21.445	-15.23	17.779	-15.68	12.74573	3
5	4.05	21.35	5.40	16.41	4.55	14.60	8.51	2.11	22.15	7.30	12.20	4.21	5.27	16.12	4.41	13.58	1.04	10.15		
	0.951	6.10	23.305	-6.09	22.081	-11.10	5.636	25.04	15.018	-15.74	8.460	19.89	22.953	-7.50	21.448	-15.22	17.778	-15.68	12.87715	5
7	3.59	21.40	5.37	16.42	4.52	15.03	8.48	2.08	22.06	7.22	12.12	4.13	5.19	16.05	4.33	13.50	0.56	10.07		
	1.072	6.85	23.421	-5.67	22.219	-10.53	5.720	25.07	15.006	-15.68	8.460	19.89	22.959	-7.46	21.452	-15.20	17.778	-15.67	13.00857	7
9	3.52	21.46	5.34	16.45	4.49	15.07	8.45	2.06	21.57	7.13	12.04	4.05	5.11	15.57	4.25	13.43	0.48	9.60		
	1.195	7.60	23.547	-5.13	22.358	-9.94	5.805	25.09	14.993	-15.62	8.461	19.89	22.965	-7.42	21.455	-15.19	17.777	-15.67	13.13999	9
11	3.46	21.51	5.30	16.48	4.46	15.11	8.42	2.03	21.48	7.05	11.56	3.57	5.04	15.50	4.18	13.35	0.40	9.52		
	1.317	8.34	23.683	-4.48	22.496	-9.32	5.889	25.10	14.979	-15.56	8.462	19.88	22.971	-7.39	21.457	-15.18	17.776	-15.67	13.27140	11
13	3.39	21.57	5.27	16.53	4.43	15.15	8.40	2.00	21.39	6.57	11.49	3.49	4.56	15.43	4.10	13.27	0.32	9.44		
	1.440	9.07	23.828	-3.72	22.635	-8.68	5.974	25.10	14.965	-15.50	8.464	19.88	22.977	-7.35	21.460	-15.16	17.775	-15.66	13.40282	13
15	3.32	22.03	5.24	16.59	4.40	15.19	8.37	1.57	21.30	6.48	11.41	3.42	4.48	15.35	4.02	13.20	0.24	9.36		
	1.563	9.79	23.981	-2.87	22.775	-8.02	6.059	25.09	14.951	-15.44	8.466	19.87	22.983	-7.32	21.463	-15.15	17.774	-15.66	13.53424	15
17	3.26	22.09	5.21	17.06	4.36	15.23	8.34	1.54	21.21	6.40	11.33	3.34	4.40	15.28	3.54	13.12	0.16	9.28		
	1.686	10.50	0.142	-1.93	22.914	-7.34	6.144	25.07	14.936	-15.37	8.469	19.86	22.988	-7.28	21.465	-15.14	17.773	-15.65	13.66566	17
19	3.19	22.15	5.17	17.14	4.33	15.28	8.32	1.51	21.12	6.32	11.26	3.26	4.33	15.21	3.46	13.04	0.08	9.20		
	1.810	11.19	0.310	-0.90	23.054	-6.63	6.229	25.04	14.921	-15.31	8.472	19.85	22.994	-7.25	21.468	-15.13	17.771	-15.65	13.79708	19
21	3.11	22.21	5.14	17.22	4.30	15.32	8.29	1.48	21.03	6.23	11.18	3.18	4.25	15.13	3.39	12.57	23.56	9.12		
	1.935	11.88	0.485	0.21	23.193	-5.91	6.314	24.99	14.905	-15.24	8.476	19.84	22.999	-7.22	21.470	-15.12	17.770	-15.64	13.92850	21
23	3.04	22.28	5.11	17.31	4.26	15.37	8.27	1.45	20.53	6.15	11.11	3.11	4.17	15.06	3.31	12.49	23.48	9.04		
	2.060	12.55	0.667	1.40	23.333	-5.17	6.400	24.94	14.889	-15.17	8.480	19.82	23.004	-7.18	21.472	-15.11	17.768	-15.64	14.05992	23
25	2.57	22.35	5.08	17.41	4.23	15.41	8.25	1.42	20.44	6.06	11.03	3.03	4.10	14.59	3.23	12.41	23.40	8.56		
	2.185	13.21	0.856	2.66	23.473	-4.41	6.486	24.88	14.873	-15.10	8.485	19.81	23.010	-7.15	21.474	-15.10	17.766	-15.63	14.19134	25
27	2.49	22.42	5.04	17.52	4.19	15.46	8.23	1.38	20.35	5.58	10.56	2.55	4.02	14.51	3.15	12.34	23.32	8.48		
	2.311	13.85	1.052	3.98	23.614	-3.64	6.571	24.81	14.856	-15.02	8.490	19.79	23.014	-7.12	21.476	-15.09	17.764	-15.63	14.32275	27
29	2.41	22.50	5.01	18.04	4.15	15.50	8.21	1.35	20.26	5.50	10.48	2.48	3.54	14.44	3.07	12.26	23.24	8.40		
	2.438	14.48	1.255	5.36	23.754	-2.86	6.657	24.72	14.840	-14.95	8.495	19.77	23.019	-7.09	21.478	-15.09	17.762	-15.63	14.45417	29

MAJ 2006

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2453																			
121	1	Pon	857	1.51019	2.55	2.3353	15.06	1.00759	5.4652	28.33	60.387	3.6	15	513	1242.8	2014	640	1605.3	030	356	1	
122	2	Wto	858	1.54585	3.02	2.3743	15.24	1.00784	6.4532	28.12	61.236	4.6	24	511	1242.7	2016	738	1701.7	131	352	2	
123	3	Śro	859	1.58550	3.08	2.4133	15.42	1.00809	7.4124	26.22	62.001	5.6	33	509	1242.6	2017	849	1754.8	214	348	3	
124	4	Czw	860	2.02516	3.14	2.4524	15.59	1.00833	8.3344	23.20	62.632	6.6	42	507	1242.5	2019	1006	1843.8	242	344	4	
125	5	Pią	861	2.06482	3.19	2.4915	16.16	1.00857	9.2228	19.21	63.091	0.2	52	505	1242.4	2021	1123	1929.0	301	340	5	
126	6	Sob	862	2.10447	3.24	2.5307	16.33	1.00880	10.0811	14.39	63.358	1.2	61	503	1242.3	2023	1239	2011.1	314	337	6	
127	7	Nie	863	2.14413	3.28	2.5659	16.50	1.00904	10.5141	9.27	63.429	2.2	70	501	1242.3	2024	1352	2051.2	324	333	7	
128	8	Pon	864	2.18378	3.32	3.0052	17.06	1.00927	11.3357	3.54	63.313	3.2	79	500	1242.2	2026	1504	2130.4	333	329	8	
129	9	Wto	865	2.22344	3.35	3.0446	17.22	1.00950	12.1601	-1.48	63.034	4.2	86	458	1242.2	2028	1616	2209.8	341	325	9	
130	10	Śro	866	2.26309	3.38	3.0840	17.38	1.00973	12.5854	-7.32	62.624	5.2	92	456	1242.1	2029	1730	2250.5	348	321	10	
131	11	Czw	867	2.30275	3.40	3.1234	17.54	1.00996	13.4339	-13.05	62.118	6.2	96	454	1242.1	2031	1847	2333.8	357	317	11	
132	12	Pią	868	2.34240	3.41	3.1629	18.09	1.01018	14.3116	-18.12	61.557	7.2	99	452	1242.1	2033	2008	*****	408	313	12	
133	13	Sob	869	2.38206	3.42	3.2025	18.24	1.01040	15.2233	-22.38	60.978	0.1	100	451	1242.0	2034	2132	020.8	423	309	13	
134	14	Nie	870	2.42172	3.42	3.2421	18.39	1.01063	16.1751	-26.02	60.410	1.1	99	449	1242.0	2036	2254	112.0	444	305	14	
135	15	Pon	871	2.46137	3.42	3.2818	18.53	1.01085	17.1647	-28.04	59.878	2.1	95	448	1242.0	2038	****	207.6	517	301	15	
136	16	Wto	872	2.50103	3.41	3.3215	19.07	1.01107	18.1760	-28.29	59.395	3.1	89	446	1242.1	2039	006	306.5	607	257	16	
137	17	Śro	873	2.54068	3.40	3.3613	19.21	1.01128	19.1932	-27.10	58.968	4.1	81	444	1242.1	2041	101	406.6	717	253	17	
138	18	Czw	874	2.58034	3.38	3.4012	19.34	1.01149	20.1929	-24.11	58.598	5.1	72	443	1242.1	2042	138	505.6	842	249	18	
139	19	Pią	875	3.01600	3.35	3.4411	19.47	1.01171	21.1640	-19.46	58.289	6.1	61	441	1242.2	2044	203	601.7	1013	245	19	
140	20	Sob	876	3.05565	3.32	3.4811	19.60	1.01191	22.1054	-14.14	58.044	0.0	50	440	1242.2	2045	220	654.6	1144	241	20	
141	21	Nie	877	3.09531	3.28	3.5211	20.12	1.01212	23.0245	-7.55	57.874	1.0	38	439	1242.3	2047	232	744.5	1313	238	21	
142	22	Pon	878	3.13496	3.24	3.5612	20.24	1.01232	23.5315	-1.12	57.796	2.0	27	437	1242.3	2048	243	832.8	1441	234	22	
143	23	Wto	879	3.17462	3.19	4.0013	20.35	1.01251	0.4337	5.36	57.829	3.0	18	436	1242.4	2050	253	920.7	1609	230	23	
144	24	Śro	880	3.21427	3.14	4.0415	20.47	1.01270	1.3503	12.07	57.993	4.0	10	435	1242.5	2051	304	1009.7	1739	226	24	
145	25	Czw	881	3.25393	3.08	4.0818	20.58	1.01289	2.2834	17.58	58.299	5.0	4	433	1242.6	2053	316	1100.9	1910	222	25	
146	26	Pią	882	3.29358	3.02	4.1220	21.08	1.01307	3.2444	22.48	58.748	6.0	1	432	1242.7	2054	333	1155.0	2041	218	26	
147	27	Sob	883	3.33324	2.55	4.1624	21.18	1.01325	4.2324	26.16	59.324	0.2	0	431	1242.8	2056	357	1251.9	2205	214	27	
148	28	Nie	884	3.37290	2.47	4.2028	21.28	1.01342	5.2331	28.10	59.997	1.2	2	430	1243.0	2057	432	1350.4	2316	210	28	
149	29	Pon	885	3.41255	2.40	4.2432	21.38	1.01358	6.2320	28.23	60.722	2.2	6	429	1243.1	2058	523	1448.4	****	206	29	
150	30	Wto	886	3.45221	2.31	4.2837	21.47	1.01374	7.2101	27.02	61.445	3.2	11	428	1243.2	2059	630	1543.8	007	202	30	
151	31	Śro	887	3.49187	2.23	4.3242	21.56	1.01390	8.1520	24.21	62.112	4.2	18	427	1243.4	2101	746	1635.2	042	158	31	

Fazy Księżyca [Dm, h.mm]: 1kw 5, 7.13 Pełn 13, 8.51 3kw 20, 11.21 Nów 27, 7.26

CZERWIEC 2006

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2453																					
152	1	Czw	888	3.53152	2.14	4.3648	22.04	1.01405	9.0551	20.37	62.672	5.2	27	426	1243.5	2102	904	1722.6	104	154	1
153	2	Pią	889	3.57118	2.04	4.4054	22.12	1.01419	9.5254	16.05	63.082	6.2	35	425	1243.7	2103	1021	1806.2	120	150	2
154	3	Sob	890	4.01083	1.55	4.4460	22.19	1.01434	10.3713	11.00	63.311	7.2	45	424	1243.8	2104	1136	1847.1	131	146	3
155	4	Nie	891	4.05049	1.45	4.4907	22.26	1.01447	11.1948	5.34	63.342	0.5	54	424	1244.0	2105	1248	1926.5	140	143	4
156	5	Pon	892	4.09014	1.34	4.5313	22.33	1.01461	12.0141	-0.05	63.173	1.5	64	423	1244.2	2106	1359	2005.5	148	139	5
157	6	Wto	893	4.12580	1.23	4.5721	22.40	1.01473	12.4359	-5.46	62.819	2.5	73	422	1244.4	2107	1512	2045.3	156	135	6
158	7	Śro	894	4.16545	1.12	5.0128	22.46	1.01486	13.2749	-11.20	62.308	3.5	81	422	1244.5	2108	1627	2127.3	204	131	7
159	8	Czw	895	4.20511	1.01	5.0536	22.51	1.01498	14.1417	-16.36	61.679	4.5	88	421	1244.7	2109	1746	2212.6	214	127	8
160	9	Pią	896	4.24477	0.50	5.0944	22.56	1.01510	15.0422	-21.16	60.982	5.5	94	421	1244.9	2110	1909	2302.2	227	123	9
161	10	Sob	897	4.28442	0.38	5.1353	23.01	1.01522	15.5844	-25.02	60.268	6.5	98	420	1245.1	2111	2033	2356.8	246	119	10
162	11	Nie	898	4.32408	0.26	5.1801	23.05	1.01533	16.5721	-27.32	59.589	7.5	100	420	1245.3	2111	2151	*****	314	115	11
163	12	Pon	899	4.36373	0.14	5.2210	23.09	1.01544	17.5908	-28.27	58.991	0.7	99	419	1245.5	2112	2254	055.6	358	111	12
164	13	Wto	900	4.40339	0.01	5.2619	23.13	1.01555	19.0204	-27.35	58.507	1.7	97	419	1245.7	2113	2338	156.8	502	107	13
165	14	Śro	901	4.44305	-0.11	5.3028	23.16	1.01565	20.0351	-24.57	58.154	2.7	91	419	1245.9	2113	****	257.9	625	103	14
166	15	Czw	902	4.48270	-0.24	5.3437	23.19	1.01575	21.0250	-20.45	57.937	3.7	83	419	1246.1	2114	007	356.3	757	059	15
167	16	Pią	903	4.52236	-0.37	5.3847	23.21	1.01585	21.5824	-15.22	57.846	4.7	74	419	1246.4	2114	026	451.0	930	055	16
168	17	Sob	904	4.56201	-0.50	5.4256	23.23	1.01594	22.5058	-9.09	57.867	5.7	63	419	1246.6	2115	040	542.2	1101	051	17
169	18	Nie	905	5.00167	-1.03	5.4706	23.24	1.01603	23.4131	-2.31	57.983	6.7	52	419	1246.8	2115	051	630.7	1228	047	18
170	19	Pon	906	5.04133	-1.16	5.5115	23.26	1.01611	0.3116	4.12	58.178	0.8	41	419	1247.0	2115	101	718.1	1355	044	19
171	20	Wto	907	5.08098	-1.29	5.5525	23.26	1.01619	1.2130	10.41	58.445	1.8	30	419	1247.2	2116	111	805.8	1522	040	20
172	21	Śro	908	5.12064	-1.42	5.5935	23.26	1.01627	2.1320	16.35	58.778	2.8	20	419	1247.4	2116	123	855.0	1651	036	21
173	22	Czw	909	5.16029	-1.55	6.0344	23.26	1.01633	3.0735	21.36	59.177	3.8	12	419	1247.7	2116	138	946.8	1820	032	22
174	23	Pią	910	5.19595	-2.08	6.0754	23.26	1.01640	4.0428	25.23	59.642	4.8	6	419	1247.9	2116	158	1041.6	1946	028	23
175	24	Sob	911	5.23560	-2.21	6.1203	23.25	1.01645	5.0324	27.43	60.165	5.8	2	420	1248.1	2116	228	1138.7	2101	024	24
176	25	Nie	912	5.27526	-2.34	6.1613	23.23	1.01650	6.0256	28.27	60.734	6.8	0	420	1248.3	2116	312	1236.5	2200	020	25
177	26	Pon	913	5.31492	-2.47	6.2022	23.21	1.01655	7.0115	27.34	61.326	0.7	1	421	1248.5	2116	413	1332.9	2240	016	26
178	27	Wto	914	5.35457	-2.60	6.2431	23.19	1.01659	7.5649	25.17	61.910	1.7	3	421	1248.7	2116	526	1426.1	2307	012	27
179	28	Śro	915	5.39423	-3.12	6.2840	23.17	1.01662	8.4848	21.49	62.448	2.7	8	422	1248.9	2116	645	1515.4	2325	008	28
180	29	Czw	916	5.43389	-3.24	6.3249	23.14	1.01665	9.3710	17.28	62.900	3.7	14	422	1249.2	2116	803	1600.6	2338	004	29
181	30	Pią	917	5.47354	-3.36	6.3658	23.10	1.01667	10.2228	12.31	63.227	4.7	21	423	1249.4	2116	919	1642.7	2348	000	30

Fazy Księżyca [Dm, h.mm]: 1kw 4, 1.06 Pełn 11, 20.03 3kw 18, 16.08 Now 25, 18.05

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Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT) Dm	
1	*****	*****	5.09	22.31	3.14	17.16	7.58	0.27	17.54	3.31	8.51	0.43	1.46	12.39	0.58	10.17	21.12	6.28		
	4.613	22.06	5.720	25.39	2.123	10.73	8.067	21.83	14.582	-13.84	8.648	19.23	23.074	-6.77	21.486	-15.06	17.715	-15.59	16.62262	1
3	*****	*****	5.17	22.41	3.10	17.22	7.57	0.22	17.45	3.23	8.45	0.36	1.38	12.31	0.50	10.09	21.04	6.20		
	4.750	22.32	5.993	25.53	2.273	11.51	8.152	21.57	14.569	-13.79	8.660	19.18	23.076	-6.76	21.485	-15.06	17.712	-15.59	16.75404	3
5	*****	*****	5.24	22.48	3.07	17.27	7.56	0.17	17.36	3.14	8.38	0.28	1.30	12.24	0.42	10.01	20.56	6.12		
	4.887	22.55	6.253	25.52	2.424	12.28	8.236	21.30	14.557	-13.74	8.673	19.13	23.078	-6.76	21.484	-15.07	17.708	-15.59	16.88546	5
7	*****	*****	5.33	22.54	3.04	17.33	7.56	0.13	17.27	3.06	8.31	0.21	1.22	12.16	0.34	9.53	20.47	6.04		
	5.025	22.76	6.500	25.37	2.575	13.04	8.320	21.02	14.546	-13.69	8.686	19.09	23.079	-6.75	21.483	-15.07	17.705	-15.59	17.01688	7
9	*****	*****	5.41	22.58	3.00	17.39	7.55	0.08	17.18	2.58	8.24	0.14	1.15	12.08	0.26	9.45	20.39	5.56		
	5.162	22.94	6.732	25.10	2.728	13.78	8.404	20.73	14.536	-13.65	8.699	19.04	23.080	-6.74	21.482	-15.08	17.701	-15.59	17.14830	9
11	*****	*****	5.49	22.60	2.57	17.45	7.54	0.03	17.10	2.50	8.18	0.06	1.07	12.00	0.19	9.37	20.31	5.48		
	5.300	23.09	6.949	24.73	2.882	14.50	8.487	20.43	14.526	-13.61	8.713	18.99	23.081	-6.74	21.481	-15.08	17.698	-15.59	17.27972	11
13	*****	*****	5.57	22.60	2.55	17.50	7.53	23.54	17.01	2.42	8.11	23.55	0.59	11.53	0.11	9.29	20.23	5.40		
	5.439	23.21	7.150	24.26	3.037	15.20	8.570	20.12	14.517	-13.57	8.726	18.93	23.082	-6.74	21.479	-15.09	17.694	-15.59	17.41115	13
15	*****	*****	6.05	22.59	2.52	17.56	7.53	23.49	16.52	2.33	8.04	23.47	0.51	11.45	0.03	9.21	20.15	5.31		
	5.577	23.31	7.335	23.72	3.193	15.88	8.653	19.81	14.508	-13.54	8.740	18.88	23.082	-6.73	21.478	-15.10	17.690	-15.59	17.54257	15
17	*****	*****	6.12	22.56	2.49	18.02	7.52	23.43	16.44	2.25	7.58	23.40	0.43	11.37	23.51	9.13	20.07	5.23		
	5.716	23.38	7.504	23.11	3.351	16.53	8.736	19.48	14.500	-13.51	8.755	18.83	23.083	-6.73	21.476	-15.11	17.687	-15.59	17.67399	17
19	*****	*****	6.18	22.52	2.47	18.07	7.51	23.38	16.36	2.17	7.51	23.33	0.35	11.29	23.43	9.05	19.59	5.15		
	5.854	23.43	7.657	22.46	3.509	17.16	8.819	19.15	14.493	-13.49	8.769	18.77	23.083	-6.73	21.474	-15.12	17.683	-15.60	17.80541	19
21	*****	*****	6.23	22.48	2.45	18.13	7.51	23.33	16.27	2.09	7.44	23.25	0.28	11.21	23.35	8.57	19.51	5.07		
	5.993	23.44	7.792	21.78	3.669	17.77	8.901	18.81	14.487	-13.46	8.784	18.72	23.083	-6.74	21.472	-15.13	17.680	-15.60	17.93683	21
23	*****	*****	6.28	22.42	2.43	18.19	7.50	23.28	16.19	2.01	7.38	23.18	0.20	11.13	23.27	8.49	19.43	4.59		
	6.132	23.43	7.909	21.08	3.831	18.35	8.984	18.46	14.481	-13.45	8.799	18.66	23.082	-6.74	21.470	-15.14	17.676	-15.60	18.06825	23
25	*****	*****	6.31	22.35	2.41	18.24	7.50	23.22	16.11	1.53	7.31	23.11	0.12	11.05	23.19	8.41	19.35	4.51		
	6.270	23.39	8.007	20.38	3.993	18.89	9.066	18.10	14.476	-13.43	8.814	18.60	23.082	-6.74	21.468	-15.15	17.673	-15.60	18.19968	25
27	*****	*****	6.32	22.27	2.39	18.30	7.49	23.17	16.02	1.45	7.25	23.03	0.04	10.57	23.11	8.33	19.27	4.43		
	6.409	23.32	8.087	19.68	4.157	19.41	9.147	17.73	14.472	-13.42	8.829	18.54	23.081	-6.75	21.466	-15.16	17.669	-15.61	18.33110	27
29	*****	*****	6.33	22.18	2.38	18.35	7.48	23.12	15.54	1.37	7.18	22.56	23.52	10.49	23.03	8.25	19.19	4.35		
	6.547	23.23	8.146	19.01	4.322	19.90	9.229	17.36	14.469	-13.41	8.845	18.48	23.080	-6.76	21.463	-15.17	17.665	-15.61	18.46252	29

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Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2453																					
182	1	Sob	918	5.51320	-3.48	6.4106	23.06	1.01668	11.0534	7.09	63.395	5.7	29	423	1249.5	2115	1032	1722.6	2356	2352	1
183	2	Nie	919	5.55285	-3.60	6.4514	23.02	1.01669	11.4728	1.34	63.380	6.7	38	424	1249.7	2115	1144	1801.5	****	2348	2
184	3	Pon	920	5.59251	-4.11	6.4922	22.57	1.01670	12.2915	-4.05	63.170	7.7	47	425	1249.9	2114	1255	1840.5	004	2345	3
185	4	Wto	921	6.03216	-4.22	6.5329	22.52	1.01670	13.1202	-9.39	62.766	0.7	57	426	1250.1	2114	1408	1921.0	011	2341	4
186	5	Śro	922	6.07182	-4.32	6.5737	22.47	1.01669	13.5657	-14.58	62.186	1.7	66	427	1250.3	2113	1524	2004.1	020	2337	5
187	6	Czw	923	6.11147	-4.42	7.0143	22.41	1.01668	14.4507	-19.48	61.464	2.7	76	428	1250.5	2113	1645	2051.2	032	2333	6
188	7	Pią	924	6.15113	-4.52	7.0550	22.35	1.01667	15.3725	-23.52	60.647	3.7	84	429	1250.6	2112	1808	2143.2	047	2329	7
189	8	Sob	925	6.19079	-5.02	7.0956	22.28	1.01666	16.3418	-26.51	59.795	4.7	91	430	1250.8	2111	1929	2240.1	111	2325	8
190	9	Nie	926	6.23044	-5.11	7.1401	22.21	1.01664	17.3515	-28.21	58.974	5.7	96	431	1250.9	2111	2040	2341.0	147	2321	9
191	10	Pon	927	6.27010	-5.19	7.1806	22.14	1.01661	18.3840	-28.07	58.248	6.7	99	432	1251.1	2110	2133	*****	242	2317	10
192	11	Wto	928	6.30576	-5.27	7.2211	22.06	1.01659	19.4210	-26.00	57.675	0.3	100	433	1251.2	2109	2207	043.4	400	2313	11
193	12	Śro	929	6.34541	-5.35	7.2615	21.58	1.01656	20.4335	-22.10	57.295	1.3	98	434	1251.3	2108	2230	144.5	532	2309	12
194	13	Czw	930	6.38507	-5.42	7.3019	21.49	1.01652	21.4142	-16.56	57.125	2.3	93	435	1251.5	2107	2246	242.3	708	2305	13
195	14	Pią	931	6.42472	-5.49	7.3422	21.40	1.01648	22.3627	-10.44	57.161	3.3	85	436	1251.6	2106	2258	336.3	842	2301	14
196	15	Sob	932	6.46438	-5.55	7.3825	21.31	1.01644	23.2835	-3.60	57.377	4.3	76	438	1251.7	2105	2309	426.9	1013	2257	15
197	16	Nie	933	6.50403	-6.01	7.4228	21.21	1.01640	0.1916	2.52	57.738	5.3	66	439	1251.8	2104	2319	515.6	1142	2253	16
198	17	Pon	934	6.54369	-6.07	7.4630	21.11	1.01635	1.0945	9.29	58.200	6.3	54	440	1251.9	2103	2330	603.6	1310	2250	17
199	18	Wto	935	6.58334	-6.11	7.5031	21.01	1.01630	2.0113	15.33	58.726	0.6	43	441	1251.9	2101	2344	652.4	1438	2246	18
200	19	Śro	936	7.02300	-6.16	7.5432	20.50	1.01624	2.5435	20.44	59.284	1.6	32	443	1252.0	2100	****	743.1	1606	2242	19
201	20	Czw	937	7.06266	-6.19	7.5832	20.39	1.01618	3.5015	24.45	59.852	2.6	23	444	1252.1	2059	002	836.4	1733	2238	20
202	21	Pią	938	7.10231	-6.23	8.0232	20.28	1.01611	4.4758	27.24	60.417	3.6	14	446	1252.1	2058	028	932.0	1851	2234	21
203	22	Sob	939	7.14197	-6.25	8.0631	20.16	1.01603	5.4638	28.29	60.971	4.6	8	447	1252.2	2056	107	1028.9	1954	2230	22
204	23	Nie	940	7.18163	-6.27	8.1030	20.04	1.01595	6.4441	28.01	61.506	5.6	3	449	1252.2	2055	201	1125.2	2040	2226	23
205	24	Pon	941	7.22128	-6.29	8.1428	19.51	1.01587	7.4035	26.05	62.016	6.6	1	450	1252.2	2053	310	1219.1	2110	2222	24
206	25	Wto	942	7.26094	-6.30	8.1825	19.38	1.01578	8.3318	22.55	62.487	0.2	0	452	1252.2	2052	427	1309.4	2130	2218	25
207	26	Śro	943	7.30059	-6.30	8.2222	19.25	1.01568	9.2233	18.47	62.902	1.2	1	453	1252.3	2050	546	1356.0	2145	2214	26
208	27	Czw	944	7.34025	-6.30	8.2619	19.12	1.01558	10.0839	13.57	63.236	2.2	5	455	1252.2	2049	703	1439.1	2155	2210	27
209	28	Pią	945	7.37590	-6.29	8.3014	18.58	1.01547	10.5218	8.39	63.465	3.2	9	456	1252.2	2047	817	1519.7	2204	2206	28
210	29	Sob	946	7.41556	-6.28	8.3409	18.44	1.01535	11.3425	3.06	63.560	4.2	16	458	1252.2	2046	929	1558.8	2212	2202	29
211	30	Nie	947	7.45522	-6.26	8.3804	18.30	1.01523	12.1558	-2.33	63.498	5.2	23	459	1252.2	2044	1041	1637.4	2219	2158	30
212	31	Pon	948	7.49487	-6.23	8.4158	18.15	1.01511	12.5801	-8.08	63.261	6.2	32	501	1252.1	2042	1152	1716.8	2227	2154	31

Fazy Księżyca [Dm, h.mm]: 1kw 3, 18.37 Pełn 11, 5.02 3kw 17, 21.12 Nów 25, 6.31

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Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	*****	*****	6.31	22.08	2.37	18.40	7.48	23.06	15.46	1.29	7.12	22.49	23.44	10.41	22.55	8.17	19.11	4.27		
	6.685	23.10	8.184	18.38	4.488	20.35	9.310	16.98	14.467	-13.41	8.861	18.42	23.079	-6.76	21.461	-15.18	17.662	-15.61	18.59394	1
3	*****	*****	6.28	21.57	2.36	18.45	7.47	23.01	15.38	1.21	7.05	22.41	23.36	10.33	22.47	8.09	19.03	4.19		
	6.823	22.96	8.202	17.80	4.655	20.77	9.391	16.59	14.465	-13.41	8.877	18.36	23.078	-6.77	21.458	-15.20	17.659	-15.62	18.72536	3
5	*****	*****	6.24	21.46	2.35	18.50	7.47	22.55	15.30	1.13	6.59	22.34	23.29	10.25	22.40	8.00	18.55	4.11		
	6.960	22.78	8.198	17.28	4.824	21.15	9.472	16.20	14.464	-13.42	8.893	18.29	23.076	-6.78	21.456	-15.21	17.655	-15.62	18.85678	5
7	*****	*****	6.17	21.34	2.35	18.55	7.46	22.49	15.23	1.05	6.52	22.27	23.21	10.17	22.32	7.52	18.47	4.02		
	7.097	22.58	8.174	16.84	4.993	21.50	9.553	15.80	14.464	-13.42	8.909	18.23	23.075	-6.80	21.453	-15.22	17.652	-15.63	18.98820	7
9	*****	*****	6.09	21.21	2.35	18.60	7.46	22.44	15.15	0.57	6.46	22.19	23.13	10.09	22.24	7.44	18.39	3.54		
	7.234	22.35	8.130	16.49	5.163	21.81	9.633	15.39	14.465	-13.44	8.925	18.16	23.073	-6.81	21.450	-15.24	17.649	-15.63	19.11963	9
11	*****	*****	5.59	21.08	2.36	19.04	7.45	22.38	15.07	0.49	6.39	22.12	23.05	10.01	22.16	7.36	18.31	3.46		
	7.370	22.10	8.067	16.24	5.335	22.08	9.714	14.98	14.466	-13.45	8.941	18.10	23.071	-6.82	21.447	-15.25	17.645	-15.64	19.25105	11
13	*****	*****	5.47	20.54	2.36	19.08	7.45	22.33	14.60	0.41	6.33	22.05	22.57	9.53	22.08	7.28	18.22	3.38		
	7.505	21.82	7.991	16.10	5.507	22.30	9.794	14.55	14.468	-13.47	8.958	18.03	23.069	-6.84	21.444	-15.27	17.642	-15.64	19.38247	13
15	*****	*****	5.35	20.41	2.37	19.12	7.44	22.27	14.52	0.33	6.26	21.57	22.49	9.45	21.60	7.20	18.14	3.30		
	7.640	21.52	7.904	16.06	5.680	22.49	9.873	14.13	14.471	-13.50	8.975	17.97	23.066	-6.85	21.441	-15.28	17.639	-15.65	19.51389	15
17	*****	*****	5.21	20.28	2.39	19.16	7.44	22.21	14.45	0.26	6.20	21.50	22.41	9.37	21.52	7.12	18.06	3.22		
	7.775	21.19	7.811	16.13	5.853	22.64	9.953	13.69	14.475	-13.53	8.991	17.90	23.064	-6.87	21.438	-15.30	17.636	-15.65	19.64531	17
19	*****	*****	5.06	20.16	2.40	19.19	7.43	22.15	14.37	0.18	6.14	21.43	22.33	9.29	21.44	7.04	17.58	3.14		
	7.909	20.84	7.720	16.29	6.027	22.74	10.033	13.26	14.479	-13.56	9.008	17.83	23.061	-6.89	21.435	-15.31	17.633	-15.66	19.77673	19
21	*****	*****	4.52	20.04	2.43	19.22	7.43	22.10	14.30	0.10	6.07	21.35	22.25	9.21	21.36	6.55	17.50	3.06		
	8.042	20.46	7.635	16.55	6.201	22.80	10.112	12.81	14.485	-13.59	9.025	17.76	23.058	-6.91	21.432	-15.33	17.630	-15.67	19.90815	21
23	*****	*****	4.38	19.54	2.45	19.25	7.42	22.04	14.23	0.02	6.01	21.28	22.17	9.13	21.28	6.47	17.42	2.58		
	8.175	20.06	7.564	16.87	6.376	22.82	10.191	12.36	14.491	-13.63	9.042	17.69	23.055	-6.93	21.428	-15.34	17.627	-15.67	20.03958	23
25	*****	*****	4.24	19.46	2.48	19.27	7.42	21.58	14.15	23.51	5.54	21.21	22.09	9.04	21.20	6.39	17.35	2.50		
	8.307	19.64	7.511	17.25	6.551	22.80	10.270	11.90	14.497	-13.67	9.059	17.62	23.052	-6.95	21.425	-15.36	17.625	-15.68	20.17100	25
27	*****	*****	4.12	19.39	2.51	19.29	7.42	21.52	14.08	23.43	5.48	21.14	22.01	8.56	21.12	6.31	17.27	2.42		
	8.438	19.20	7.482	17.66	6.726	22.73	10.349	11.44	14.505	-13.72	9.076	17.55	23.049	-6.97	21.422	-15.38	17.622	-15.69	20.30242	27
29	1.08	0.05	4.01	19.34	2.54	19.31	7.41	21.46	14.01	23.35	5.42	21.06	21.53	8.48	21.04	6.23	17.19	2.34		
	8.569	18.73	7.478	18.09	6.901	22.61	10.428	10.98	14.513	-13.76	9.093	17.48	23.045	-6.99	21.418	-15.39	17.620	-15.69	20.43384	29
31	1.34	-0.05	3.52	19.30	2.58	19.32	7.41	21.41	13.54	23.28	5.35	20.59	21.45	8.40	20.56	6.15	17.11	2.26		
	8.699	18.25	7.502	18.51	7.075	22.46	10.506	10.51	14.522	-13.82	9.111	17.41	23.042	-7.01	21.415	-15.41	17.617	-15.70	20.56526	31

SIERPIEŃ 2006

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)											Czas strefowy [hhmm.]							
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
2453																					
213	1	Wto	949	7.53453	-6.20	8.4551	18.00	1.01498	13.4136	-13.29	62.840	7.2	41	503	1252.1	2041	1306	1758.1	2237	2151	1
214	2	Śro	950	7.57418	-6.16	8.4943	17.45	1.01484	14.2749	-18.25	62.240	0.1	51	504	1252.0	2039	1424	1842.6	2250	2147	2
215	3	Czw	951	8.01384	-6.11	8.5335	17.29	1.01470	15.1739	-22.42	61.483	1.1	60	506	1251.9	2037	1544	1931.3	2309	2143	3
216	4	Pią	952	8.05349	-6.06	8.5727	17.13	1.01456	16.1147	-26.02	60.606	2.1	70	507	1251.8	2035	1706	2024.9	2338	2139	4
217	5	Sob	953	8.09315	-5.60	9.0117	16.57	1.01442	17.1017	-28.05	59.662	3.1	79	509	1251.7	2033	1821	2123.2	****	2135	5
218	6	Nie	954	8.13281	-5.54	9.0508	16.41	1.01427	18.1212	-28.33	58.721	4.1	88	511	1251.6	2031	1922	2224.5	023	2131	6
219	7	Pon	955	8.17246	-5.46	9.0857	16.24	1.01412	19.1539	-27.10	57.857	5.1	94	512	1251.5	2030	2004	2326.5	130	2127	7
220	8	Wto	956	8.21212	-5.39	9.1246	16.07	1.01396	20.1821	-23.58	57.147	6.1	98	514	1251.4	2028	2032	*****	257	2123	8
221	9	Śro	957	8.25177	-5.31	9.1634	15.50	1.01380	21.1838	-19.09	56.654	7.1	100	516	1251.3	2026	2051	026.6	433	2119	9
222	10	Czw	958	8.29143	-5.22	9.2022	15.33	1.01364	22.1550	-13.06	56.420	1.0	99	517	1251.1	2024	2105	123.5	611	2115	10
223	11	Pią	959	8.33108	-5.12	9.2409	15.15	1.01348	23.1017	-6.17	56.459	2.0	94	519	1251.0	2022	2116	217.0	747	2111	11
224	12	Sob	960	8.37074	-5.02	9.2756	14.57	1.01331	0.0255	0.50	56.752	3.0	87	521	1250.8	2020	2126	308.0	920	2107	12
225	13	Nie	961	8.41039	-4.52	9.3142	14.39	1.01315	0.5453	7.48	57.255	4.0	79	522	1250.6	2018	2137	357.8	1051	2103	13
226	14	Pon	962	8.45005	-4.41	9.3527	14.21	1.01297	1.4722	14.13	57.910	5.0	68	524	1250.4	2016	2150	447.7	1221	2059	14
227	15	Wto	963	8.48570	-4.29	9.3912	14.02	1.01280	2.4116	19.45	58.654	6.0	57	526	1250.2	2013	2207	539.0	1352	2055	15
228	16	Śro	964	8.52536	-4.17	9.4257	13.43	1.01262	3.3705	24.07	59.430	0.3	46	528	1250.0	2011	2230	632.3	1521	2052	16
229	17	Czw	965	8.56502	-4.05	9.4641	13.24	1.01244	4.3440	27.05	60.189	1.3	36	529	1249.8	2009	2305	727.6	1643	2048	17
230	18	Pią	966	9.00467	-3.52	9.5024	13.05	1.01226	5.3307	28.31	60.901	2.3	26	531	1249.6	2007	2354	824.2	1751	2044	18
231	19	Sob	967	9.04433	-3.38	9.5407	12.45	1.01207	6.3104	28.22	61.544	3.3	17	533	1249.4	2005	****	920.5	1841	2040	19
232	20	Nie	968	9.08398	-3.24	9.5750	12.26	1.01187	7.2704	26.46	62.110	4.3	11	534	1249.1	2003	059	1014.7	1915	2036	20
233	21	Pon	969	9.12364	-3.10	10.0132	12.06	1.01168	8.2006	23.53	62.594	5.3	5	536	1248.9	2001	214	1105.7	1937	2032	21
234	22	Wto	970	9.16329	-2.55	10.0514	11.46	1.01147	9.0949	19.58	62.997	6.3	2	538	1248.7	1958	332	1153.1	1953	2028	22
235	23	Śro	971	9.20295	-2.39	10.0855	11.25	1.01127	9.5625	15.18	63.314	7.3	0	540	1248.4	1956	450	1237.0	2004	2024	23
236	24	Czw	972	9.24261	-2.23	10.1235	11.05	1.01105	10.4030	10.06	63.543	0.6	0	541	1248.1	1954	605	1318.2	2013	2020	24
237	25	Pią	973	9.28226	-2.07	10.1616	10.44	1.01084	11.2252	4.34	63.672	1.6	2	543	1247.9	1952	717	1357.6	2021	2016	25
238	26	Sob	974	9.32192	-1.50	10.1956	10.23	1.01062	12.0426	-1.05	63.688	2.6	6	545	1247.6	1949	829	1436.2	2028	2012	26
239	27	Nie	975	9.36157	-1.33	10.2335	10.02	1.01039	12.4609	-6.43	63.576	3.6	11	546	1247.3	1947	940	1515.1	2036	2008	27
240	28	Pon	976	9.40123	-1.16	10.2714	9.41	1.01016	13.2859	-12.08	63.320	4.6	18	548	1247.0	1945	1053	1555.3	2045	2004	28
241	29	Wto	977	9.44088	-0.58	10.3053	9.20	1.00993	14.1354	-17.10	62.908	5.6	26	550	1246.7	1942	1208	1638.0	2056	2000	29
242	30	Śro	978	9.48054	-0.40	10.3431	8.59	1.00969	15.0149	-21.36	62.336	6.6	35	552	1246.4	1940	1326	1724.2	2112	1957	30
243	31	Czw	979	9.52019	-0.21	10.3809	8.37	1.00945	15.5329	-25.12	61.612	7.6	45	553	1246.1	1938	1446	1814.6	2136	1953	31

Fazy Księżyca [Dm, h.mm]: 1kw 2, 10.46 Pełn 9, 12.54 3kw 16, 3.51 Nów 23, 21.10

WRZESIEŃ 2006

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)											Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2453																			
244	1	Pią	980	9.55585	-0.03	10.4147	8.15	1.00921	16.4908	-27.39	60.759	0.5	55	555	1245.8	1935	1603	1909.4	2212	1949	1	
245	2	Sob	981	9.59550	0.17	10.4524	7.54	1.00896	17.4822	-28.41	59.814	1.5	65	557	1245.5	1933	1709	2007.8	2307	1945	2	
246	3	Nie	982	10.03516	0.36	10.4902	7.32	1.00872	18.4950	-28.03	58.835	2.5	75	558	1245.1	1931	1759	2108.1	****	1941	3	
247	4	Pon	983	10.07482	0.56	10.5238	7.10	1.00847	19.5142	-25.38	57.894	3.5	84	600	1244.8	1928	1832	2208.1	023	1937	4	
248	5	Wto	984	10.11447	1.16	10.5615	6.47	1.00822	20.5216	-21.31	57.070	4.5	92	602	1244.5	1926	1854	2306.0	155	1933	5	
249	6	Śro	985	10.15413	1.36	10.5951	6.25	1.00796	21.5031	-15.58	56.444	5.5	97	604	1244.1	1924	1910	*****	332	1929	6	
250	7	Czw	986	10.19378	1.57	11.0327	6.03	1.00771	22.4625	-9.21	56.079	6.5	100	605	1243.8	1921	1922	001.2	509	1925	7	
251	8	Pią	987	10.23344	2.17	11.0703	5.40	1.00746	23.4035	-2.10	56.013	0.6	99	607	1243.5	1919	1933	054.0	645	1921	8	
252	9	Sob	988	10.27309	2.38	11.1039	5.18	1.00720	0.3402	5.07	56.250	1.6	96	609	1243.1	1916	1944	145.4	819	1917	9	
253	10	Nie	989	10.31275	2.59	11.1414	4.55	1.00695	1.2753	12.01	56.760	2.6	90	610	1242.8	1914	1956	236.8	953	1913	10	
254	11	Pon	990	10.35240	3.20	11.1750	4.32	1.00669	2.2303	18.07	57.483	3.6	82	612	1242.4	1912	2011	329.3	1128	1909	11	
255	12	Wto	991	10.39206	3.41	11.2125	4.09	1.00643	3.2004	23.02	58.345	4.6	72	614	1242.1	1909	2032	423.7	1301	1905	12	
256	13	Śro	992	10.43171	4.03	11.2501	3.46	1.00617	4.1847	26.31	59.269	5.6	61	615	1241.7	1907	2103	520.2	1429	1901	13	
257	14	Czw	993	10.47137	4.24	11.2836	3.23	1.00591	5.1819	28.23	60.186	6.6	51	617	1241.3	1904	2148	617.9	1544	1858	14	
258	15	Pią	994	10.51102	4.45	11.3211	3.00	1.00565	6.1715	28.37	61.040	0.9	40	619	1241.0	1902	2249	715.4	1640	1854	15	
259	16	Sob	995	10.55068	5.07	11.3546	2.37	1.00539	7.1407	27.20	61.796	1.9	30	621	1240.6	1900	****	810.8	1719	1850	16	
260	17	Nie	996	10.59034	5.28	11.3921	2.14	1.00512	8.0753	24.43	62.429	2.9	22	622	1240.3	1857	002	902.9	1744	1846	17	
261	18	Pon	997	11.02599	5.50	11.4256	1.51	1.00485	8.5810	21.02	62.933	3.9	14	624	1239.9	1855	120	951.2	1801	1842	18	
262	19	Wto	998	11.06565	6.11	11.4632	1.28	1.00458	9.4513	16.32	63.308	4.9	8	626	1239.6	1852	238	1035.9	1814	1838	19	
263	20	Śro	999	11.10530	6.32	11.5007	1.04	1.00431	10.2939	11.27	63.560	5.9	4	627	1239.2	1850	353	1117.6	1823	1834	20	
264	21	Czw	000	11.14496	6.53	11.5342	0.41	1.00404	11.1215	5.60	63.699	6.9	1	629	1238.9	1847	506	1157.4	1831	1830	21	
265	22	Pią	001	11.18461	7.14	11.5718	0.18	1.00376	11.5355	0.21	63.731	7.9	0	631	1238.5	1845	618	1236.1	1838	1826	22	
266	23	Sob	002	11.22427	7.36	12.0053	-0.06	1.00348	12.3534	-5.19	63.660	0.9	1	633	1238.2	1843	729	1314.9	1846	1822	23	
267	24	Nie	003	11.26392	7.56	12.0429	-0.29	1.00320	13.1807	-10.49	63.484	1.9	3	634	1237.8	1840	841	1354.6	1854	1818	24	
268	25	Pon	004	11.30358	8.17	12.0805	-0.53	1.00291	14.0227	-15.58	63.200	2.9	8	636	1237.5	1838	956	1436.4	1905	1814	25	
269	26	Wto	005	11.34323	8.38	12.1141	-1.16	1.00262	14.4925	-20.34	62.801	3.9	13	638	1237.1	1835	1113	1521.2	1919	1810	26	
270	27	Śro	006	11.38289	8.58	12.1517	-1.39	1.00233	15.3940	-24.23	62.281	4.9	21	640	1236.8	1833	1232	1609.6	1939	1806	27	
271	28	Czw	007	11.42254	9.18	12.1853	-2.03	1.00204	16.3327	-27.07	61.640	5.9	29	641	1236.4	1831	1350	1702.0	2009	1802	28	
272	29	Pią	008	11.46220	9.38	12.2230	-2.26	1.00175	17.3029	-28.33	60.886	6.9	39	643	1236.1	1828	1459	1757.7	2056	1759	29	
273	30	Sob	009	11.50185	9.58	12.2606	-2.49	1.00146	18.2943	-28.27	60.042	7.9	50	645	1235.8	1826	1553	1855.6	2202	1755	30	

Fazy Księżyca [Dm, h.mm]: 1kw 1, 0.56 Pełn 7, 20.42 3kw 14, 13.15 Nów 22, 13.45 1kw 30, 13.04

WRZESIEŃ 2006 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE			MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST (0 ^h UT) Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	
1	3.43	21.47	5.54	19.45	4.28	19.15	7.34	20.06	12.09	21.29	3.53	19.02	19.38	6.27	18.49	4.04	15.04	0.18		
	10.696	8.26	10.754	9.77	9.780	14.52	11.756	2.47	14.753	-15.02	9.381	16.24	22.970	-7.47	21.359	-15.68	17.596	-15.86	22.66797	1
3	3.49	21.41	6.09	19.43	4.34	19.12	7.33	19.60	12.03	21.21	3.47	18.54	19.30	6.19	18.41	3.56	14.57	0.10		
	10.817	7.53	10.991	8.23	9.941	13.74	11.834	1.95	14.772	-15.12	9.398	16.17	22.965	-7.50	21.355	-15.70	17.595	-15.87	22.79939	3
5	3.54	21.34	6.23	19.40	4.41	19.09	7.33	19.54	11.57	21.14	3.40	18.47	19.22	6.11	18.33	3.47	14.49	0.02		
	10.937	6.79	11.221	6.67	10.101	12.93	11.912	1.42	14.792	-15.21	9.414	16.10	22.960	-7.53	21.352	-15.71	17.595	-15.88	22.93081	5
7	3.59	21.28	6.37	19.37	4.47	19.06	7.32	19.48	11.51	21.07	3.34	18.40	19.14	6.02	18.25	3.39	14.41	23.50		
	11.058	6.04	11.444	5.09	10.260	12.10	11.991	0.90	14.812	-15.31	9.430	16.03	22.955	-7.56	21.349	-15.73	17.595	-15.89	23.06223	7
9	4.03	21.22	6.51	19.34	4.54	19.02	7.32	19.42	11.45	20.60	3.27	18.32	19.06	5.54	18.17	3.31	14.33	23.42		
	11.177	5.29	11.661	3.52	10.418	11.25	12.069	0.37	14.833	-15.41	9.446	15.96	22.951	-7.59	21.346	-15.74	17.596	-15.90	23.19365	9
11	4.08	21.16	7.04	19.30	5.00	18.59	7.32	19.36	11.39	20.52	3.21	18.25	18.58	5.46	18.09	3.23	14.25	23.34		
	11.297	4.54	11.872	1.94	10.575	10.37	12.148	-0.16	14.854	-15.51	9.461	15.89	22.946	-7.62	21.343	-15.75	17.596	-15.91	23.32506	11
13	4.13	21.10	7.17	19.26	5.07	18.55	7.31	19.30	11.33	20.45	3.14	18.18	18.50	5.37	18.01	3.15	14.18	23.26		
	11.417	3.77	12.078	0.38	10.732	9.48	12.227	-0.69	14.876	-15.61	9.477	15.82	22.941	-7.65	21.340	-15.77	17.597	-15.93	23.45648	13
15	4.17	21.04	7.29	19.22	5.14	18.52	7.31	19.24	11.27	20.38	3.08	18.10	18.42	5.29	17.53	3.07	14.10	23.18		
	11.536	3.01	12.279	-1.16	10.887	8.56	12.306	-1.22	14.898	-15.72	9.492	15.75	22.936	-7.68	21.337	-15.78	17.597	-15.94	23.58790	15
17	4.22	20.58	7.41	19.18	5.20	18.48	7.31	19.18	11.21	20.31	3.01	18.03	18.34	5.21	17.45	2.59	14.02	23.10		
	11.656	2.23	12.476	-2.68	11.042	7.64	12.385	-1.75	14.921	-15.82	9.507	15.68	22.931	-7.71	21.335	-15.79	17.598	-15.95	23.71933	17
19	4.26	20.52	7.53	19.14	5.27	18.44	7.30	19.12	11.15	20.24	2.55	17.56	18.26	5.12	17.37	2.51	13.55	23.02		
	11.775	1.46	12.669	-4.17	11.197	6.69	12.464	-2.28	14.944	-15.93	9.522	15.61	22.926	-7.74	21.332	-15.81	17.599	-15.96	23.85075	19
21	4.30	20.47	8.04	19.10	5.33	18.40	7.30	19.06	11.10	20.17	2.48	17.48	18.18	5.04	17.29	2.43	13.47	22.54		
	11.895	0.68	12.858	-5.63	11.351	5.73	12.544	-2.80	14.967	-16.03	9.537	15.55	22.921	-7.77	21.329	-15.82	17.600	-15.97	23.98216	21
23	4.35	20.41	8.15	19.05	5.40	18.36	7.30	19.00	11.04	20.09	2.42	17.41	18.10	4.56	17.21	2.34	13.39	22.47		
	12.015	-0.10	13.044	-7.06	11.504	4.77	12.624	-3.33	14.991	-16.14	9.551	15.48	22.917	-7.79	21.327	-15.83	17.601	-15.99	0.11358	23
25	4.39	20.36	8.26	19.01	5.46	18.32	7.30	18.54	10.58	20.02	2.35	17.33	18.02	4.48	17.13	2.26	13.31	22.39		
	12.135	-0.88	13.227	-8.44	11.657	3.79	12.704	-3.86	15.015	-16.25	9.565	15.42	22.912	-7.82	21.325	-15.84	17.603	-16.00	0.24500	25
27	4.43	20.30	8.36	18.56	5.53	18.28	7.29	18.48	10.52	19.55	2.28	17.26	17.54	4.39	17.05	2.18	13.24	22.31		
	12.255	-1.65	13.407	-9.79	11.810	2.80	12.784	-4.39	15.040	-16.36	9.579	15.35	22.908	-7.85	21.323	-15.85	17.604	-16.01	0.37642	27
29	4.47	20.25	8.46	18.52	5.59	18.24	7.29	18.42	10.47	19.48	2.22	17.18	17.46	4.31	16.57	2.10	13.16	22.23		
	12.375	-2.43	13.585	-11.09	11.962	1.81	12.865	-4.92	15.065	-16.47	9.593	15.29	22.903	-7.88	21.320	-15.86	17.606	-16.02	0.50784	29

PAŹDZIERNIK 2006

Piwnice, CA UMK			← Dane na godz. 12 czasu strefowego (= 10 lub 11 ^b UT) →									 Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2454																		
274	1	Nie	010	11.54151	10.18	12.2943	-3.13	1.00117	19.2941	-26.42	59.143	1.0	60	647	1235.5	1823	1631	1953.8	2325	1751	1
275	2	Pon	011	11.58117	10.37	12.3321	-3.36	1.00087	20.2851	-23.19	58.243	2.0	71	648	1235.1	1821	1656	2050.6	****	1747	2
276	3	Wto	012	12.02082	10.56	12.3658	-3.59	1.00058	21.2617	-18.27	57.410	3.0	81	650	1234.8	1819	1714	2145.3	057	1743	3
277	4	Śro	013	12.06048	11.15	12.4036	-4.22	1.00029	22.2145	-12.24	56.720	4.0	89	652	1234.5	1816	1728	2238.0	231	1739	4
278	5	Czw	014	12.10013	11.33	12.4414	-4.45	1.00000	23.1546	-5.31	56.244	5.0	96	654	1234.2	1814	1739	2329.5	406	1735	5
279	6	Pią	015	12.13579	11.51	12.4753	-5.08	0.99971	0.0914	1.45	56.041	6.0	99	655	1233.9	1811	1750	*****	540	1731	6
280	7	Sob	016	12.17544	12.09	12.5132	-5.31	0.99942	1.0315	8.56	56.140	0.3	100	657	1233.6	1809	1801	020.9	715	1727	7
281	8	Nie	017	12.21510	12.26	12.5511	-5.54	0.99913	1.5850	15.34	56.536	1.3	98	659	1233.3	1807	1815	113.6	851	1723	8
282	9	Pon	018	12.25475	12.42	12.5851	-6.17	0.99885	2.5639	21.10	57.190	2.3	92	701	1233.0	1804	1834	208.5	1028	1719	9
283	10	Wto	019	12.29441	12.59	13.0231	-6.40	0.99857	3.5640	25.22	58.035	3.3	85	702	1232.8	1802	1901	306.0	1202	1715	10
284	11	Śro	020	12.33406	13.15	13.0612	-7.02	0.99828	4.5801	27.54	58.991	4.3	76	704	1232.5	1800	1941	405.4	1327	1711	11
285	12	Czw	021	12.37372	13.30	13.0953	-7.25	0.99800	5.5904	28.41	59.977	5.3	66	706	1232.2	1757	2037	505.2	1433	1707	12
286	13	Pią	022	12.41337	13.45	13.1335	-7.48	0.99772	6.5803	27.48	60.920	6.3	56	708	1232.0	1755	2148	603.2	1519	1704	13
287	14	Sob	023	12.45303	13.59	13.1718	-8.10	0.99744	7.5339	25.29	61.764	0.4	46	710	1231.8	1753	2306	657.7	1549	1700	14
288	15	Nie	024	12.49269	14.12	13.2100	-8.32	0.99717	8.4521	22.02	62.468	1.4	36	712	1231.5	1751	****	747.9	1608	1656	15
289	16	Pon	025	12.53234	14.26	13.2444	-8.54	0.99689	9.3323	17.43	63.011	2.4	27	713	1231.3	1748	025	833.9	1622	1652	16
290	17	Wto	026	12.57200	14.38	13.2828	-9.16	0.99661	10.1825	12.46	63.387	3.4	19	715	1231.1	1746	141	916.6	1632	1648	17
291	18	Śro	027	13.01165	14.50	13.3213	-9.38	0.99633	11.0121	7.24	63.601	4.4	12	717	1230.9	1744	255	956.8	1641	1644	18
292	19	Czw	028	13.05131	15.01	13.3558	-9.60	0.99606	11.4308	1.48	63.667	5.4	7	719	1230.7	1742	407	1035.8	1648	1640	19
293	20	Pią	029	13.09096	15.12	13.3944	-10.21	0.99578	12.2445	-3.52	63.603	6.4	3	721	1230.5	1740	518	1114.4	1656	1636	20
294	21	Sob	030	13.13062	15.22	13.4330	-10.43	0.99550	13.0709	-9.25	63.430	7.4	1	723	1230.4	1737	630	1153.9	1704	1632	21
295	22	Nie	031	13.17027	15.31	13.4718	-11.04	0.99523	13.5114	-14.42	63.164	0.2	0	724	1230.2	1735	744	1235.2	1714	1628	22
296	23	Pon	032	13.20593	15.40	13.5106	-11.25	0.99495	14.3750	-19.28	62.818	1.2	1	726	1230.1	1733	901	1319.3	1727	1624	23
297	24	Wto	033	13.24558	15.48	13.5454	-11.46	0.99467	15.2734	-23.30	62.400	2.2	5	728	1230.0	1731	1020	1406.9	1745	1620	24
298	25	Śro	034	13.28524	15.55	13.5843	-12.07	0.99440	16.2043	-26.30	61.914	3.2	10	730	1229.8	1729	1138	1458.2	1812	1616	25
299	26	Czw	035	13.32490	16.02	14.0233	-12.28	0.99412	17.1655	-28.15	61.360	4.2	16	732	1229.7	1727	1250	1552.8	1853	1612	26
300	27	Pią	036	13.36455	16.07	14.0624	-12.48	0.99384	18.1510	-28.31	60.741	5.2	25	734	1229.6	1725	1349	1649.5	1952	1608	27
301	28	Sob	037	13.40421	16.12	14.1016	-13.08	0.99357	19.1359	-27.12	60.065	6.2	34	736	1229.5	1723	1431	1746.5	2108	1605	28
302	29	Nie	038	13.44386	16.17	14.1408	-13.28	0.99330	20.1157	-24.19	59.349	7.2	45	738	1229.5	1721	1500	1842.1	2235	1601	29
302	29	Nie	038	14.44485	16.17	14.1418	-13.29	0.99329	20.1419	-24.10	59.318	7.2	45	638	1129.5	1621	1400	1742.1	2135	1501	29
303	30	Pon	039	14.48450	16.21	14.1811	-13.49	0.99301	21.1022	-19.49	58.591	0.6	56	639	1129.4	1619	1419	1835.6	2305	1457	30
304	31	Wto	040	14.52416	16.23	14.2204	-14.08	0.99275	22.0425	-14.18	57.896	1.6	67	641	1129.4	1617	1433	1927.0	****	1453	31

Fazy Księżyca [Dm, h.mm]: 1kw 0, 13.04 Pełn 7, 5.13 3kw 14, 2.26 Now 22, 7.14 Now 22, 6.14 1kw 29, 22.25

PAŹDZIERNIK 2006 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.51	20.20	8.56	18.47	6.06	18.20	7.29	18.37	10.41	19.41	2.15	17.11	17.38	4.23	16.49	2.02	13.08	22.15		
	12.495	-3.21	13.759	-12.34	12.114	0.81	12.946	-5.44	15.091	-16.57	9.607	15.23	22.899	-7.90	21.318	-15.87	17.608	-16.03	0.63926	1
3	4.55	20.15	9.05	18.42	6.13	18.16	7.29	18.31	10.35	19.34	2.08	17.04	17.30	4.14	16.41	1.54	13.01	22.07		
	12.616	-3.98	13.931	-13.54	12.267	-0.19	13.027	-5.96	15.116	-16.68	9.620	15.17	22.895	-7.93	21.317	-15.88	17.610	-16.05	0.77068	3
5	4.58	20.10	9.15	18.38	6.19	18.12	7.29	18.25	10.30	19.27	2.02	16.56	17.22	4.06	16.33	1.46	12.53	21.60		
	12.737	-4.75	14.100	-14.69	12.419	-1.19	13.108	-6.48	15.142	-16.80	9.633	15.11	22.890	-7.95	21.315	-15.89	17.612	-16.06	0.90210	5
7	5.02	20.05	9.23	18.33	6.26	18.08	7.29	18.19	10.24	19.20	1.55	16.49	17.14	3.58	16.26	1.38	12.45	21.52		
	12.859	-5.52	14.266	-15.78	12.572	-2.19	13.190	-7.00	15.169	-16.91	9.645	15.05	22.886	-7.97	21.313	-15.89	17.614	-16.07	1.03351	7
9	5.06	19.60	9.31	18.29	6.32	18.04	7.28	18.13	10.19	19.13	1.48	16.41	17.06	3.50	16.18	1.30	12.38	21.44		
	12.981	-6.28	14.428	-16.81	12.724	-3.20	13.272	-7.52	15.195	-17.02	9.658	15.00	22.882	-8.00	21.312	-15.90	17.617	-16.08	1.16493	9
11	5.09	19.55	9.39	18.24	6.39	17.60	7.28	18.08	10.13	19.06	1.41	16.34	16.58	3.42	16.10	1.22	12.30	21.36		
	13.103	-7.04	14.585	-17.76	12.877	-4.19	13.355	-8.03	15.222	-17.13	9.670	14.94	22.879	-8.02	21.310	-15.91	17.619	-16.09	1.29635	11
13	5.13	19.51	9.46	18.20	6.46	17.56	7.28	18.02	10.08	18.59	1.34	16.26	16.50	3.33	16.02	1.14	12.22	21.28		
	13.226	-7.79	14.736	-18.64	13.031	-5.19	13.438	-8.54	15.250	-17.24	9.682	14.89	22.875	-8.04	21.309	-15.91	17.622	-16.11	1.42777	13
15	5.17	19.46	9.52	18.15	6.52	17.52	7.28	17.56	10.02	18.53	1.28	16.19	16.42	3.25	15.54	1.06	12.15	21.21		
	13.350	-8.54	14.880	-19.44	13.185	-6.17	13.521	-9.05	15.277	-17.35	9.693	14.84	22.872	-8.06	21.308	-15.92	17.625	-16.12	1.55919	15
17	5.20	19.42	9.57	18.11	6.59	17.48	7.28	17.51	9.57	18.46	1.21	16.11	16.34	3.17	15.46	0.58	12.07	21.13		
	13.474	-9.27	15.015	-20.15	13.339	-7.15	13.605	-9.56	15.305	-17.46	9.704	14.79	22.868	-8.08	21.307	-15.92	17.627	-16.13	1.69061	17
19	5.24	19.38	10.01	18.06	7.06	17.44	7.28	17.45	9.51	18.39	1.14	16.04	16.26	3.09	15.38	0.50	11.60	21.05		
	13.599	-10.00	15.139	-20.76	13.495	-8.12	13.689	-10.06	15.333	-17.57	9.715	14.74	22.865	-8.10	21.306	-15.93	17.631	-16.14	1.82203	19
21	5.27	19.33	10.03	18.01	7.12	17.40	7.28	17.39	9.46	18.32	1.07	15.56	16.18	3.01	15.30	0.42	11.52	20.57		
	13.725	-10.72	15.250	-21.25	13.651	-9.07	13.774	-10.55	15.361	-17.68	9.725	14.69	22.862	-8.12	21.306	-15.93	17.634	-16.15	1.95344	21
23	5.31	19.29	10.03	17.56	7.19	17.37	7.28	17.34	9.40	18.25	0.60	15.49	16.10	2.53	15.22	0.35	11.44	20.50		
	13.852	-11.42	15.342	-21.62	13.808	-10.02	13.859	-11.05	15.390	-17.79	9.735	14.65	22.859	-8.13	21.305	-15.93	17.637	-16.16	2.08486	23
25	5.34	19.25	10.01	17.51	7.26	17.33	7.28	17.28	9.35	18.18	0.53	15.41	16.02	2.44	15.15	0.27	11.37	20.42		
	13.979	-12.12	15.412	-21.83	13.966	-10.95	13.944	-11.54	15.419	-17.90	9.745	14.61	22.857	-8.15	21.305	-15.93	17.640	-16.18	2.21628	25
27	5.38	19.22	9.56	17.46	7.33	17.29	7.28	17.23	9.29	18.11	0.46	15.34	15.55	2.36	15.07	0.19	11.29	20.34		
	14.107	-12.80	15.455	-21.88	14.124	-11.86	14.030	-12.02	15.448	-18.01	9.754	14.57	22.854	-8.16	21.305	-15.93	17.644	-16.19	2.34771	27
29	5.41	19.18	9.47	17.39	7.40	17.26	7.28	17.17	9.24	18.05	0.39	15.26	15.47	2.28	14.59	0.11	11.22	20.27		
	14.236	-13.47	15.465	-21.71	14.284	-12.75	14.117	-12.50	15.477	-18.12	9.763	14.53	22.852	-8.17	21.305	-15.94	17.648	-16.20	2.47913	29
29	4.41	18.18	8.47	16.40	6.40	16.26	6.28	16.17	8.24	17.05	23.35	14.26	14.47	1.28	13.59	23.07	10.22	19.27		
	14.238	-13.48	15.465	-21.71	14.288	-12.77	14.118	-12.51	15.477	-18.12	9.763	14.53	22.852	-8.18	21.305	-15.94	17.648	-16.20	2.47913	29
31	4.44	18.14	8.35	16.33	6.47	16.23	6.28	16.12	8.18	16.58	23.28	14.18	14.39	1.20	13.51	22.59	10.14	19.19		
	14.368	-14.14	15.437	-21.31	14.449	-13.64	14.205	-12.98	15.507	-18.23	9.772	14.49	22.850	-8.19	21.305	-15.93	17.651	-16.21	2.61055	31

LISTOPAD 2006

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2454																					
305	1	Śro	041	14.56382	16.25	14.2559	-14.28	0.99248	22.5655	-7.54	57.288	2.6	78	643	1129.3	1615	1445	2016.9	036	1449	1
306	2	Czw	042	15.00347	16.27	14.2954	-14.47	0.99222	23.4850	-0.58	56.828	3.6	87	645	1129.3	1613	1456	2106.6	207	1445	2
307	3	Pią	043	15.04313	16.27	14.3350	-15.06	0.99196	0.4118	6.07	56.573	4.6	94	647	1129.3	1611	1506	2157.4	338	1441	3
308	4	Sob	044	15.08278	16.27	14.3747	-15.24	0.99170	1.3528	12.55	56.564	5.6	98	649	1129.3	1609	1519	2250.6	512	1437	4
309	5	Nie	045	15.12244	16.26	14.4145	-15.42	0.99145	2.3218	18.57	56.820	6.6	100	651	1129.3	1607	1535	2347.0	648	1433	5
310	6	Pon	046	15.16209	16.24	14.4543	-16.01	0.99120	3.3206	23.46	57.329	0.9	99	653	1129.3	1605	1558	*****	825	1429	6
311	7	Wto	047	15.20175	16.21	14.4943	-16.18	0.99096	4.3417	27.01	58.048	1.9	95	654	1129.4	1604	1632	046.6	957	1425	7
312	8	Śro	048	15.24140	16.17	14.5343	-16.36	0.99072	5.3713	28.27	58.915	2.9	89	656	1129.5	1602	1722	148.0	1114	1421	8
313	9	Czw	049	15.28106	16.13	14.5744	-16.53	0.99048	6.3844	28.06	59.854	3.9	81	658	1129.5	1600	1829	248.9	1211	1417	9
314	10	Pią	050	15.32072	16.07	15.0146	-17.10	0.99025	7.3659	26.09	60.787	4.9	72	700	1129.6	1558	1947	346.8	1248	1413	10
315	11	Sob	051	15.36037	16.01	15.0549	-17.27	0.99002	8.3101	22.56	61.647	5.9	63	702	1129.7	1557	2108	440.2	1312	1409	11
316	12	Nie	052	15.40003	15.54	15.0952	-17.43	0.98979	9.2048	18.45	62.378	6.9	53	704	1129.8	1555	2226	528.8	1328	1406	12
317	13	Pon	053	15.43568	15.46	15.1357	-17.59	0.98957	10.0701	13.54	62.943	0.7	43	706	1130.0	1554	2341	613.2	1340	1402	13
318	14	Wto	054	15.47534	15.37	15.1802	-18.15	0.98935	10.5038	8.37	63.320	1.7	34	708	1130.1	1552	****	654.5	1349	1358	14
319	15	Śro	055	15.51499	15.28	15.2208	-18.30	0.98914	11.3241	3.04	63.506	2.7	25	709	1130.3	1551	054	733.9	1357	1354	15
320	16	Czw	056	15.55465	15.17	15.2616	-18.46	0.98892	12.1416	-2.34	63.509	3.7	18	711	1130.5	1549	205	812.6	1405	1350	16
321	17	Pią	057	15.59430	15.06	15.3024	-19.00	0.98871	12.5625	-8.09	63.351	4.7	11	713	1130.7	1548	316	851.7	1413	1346	17
322	18	Sob	058	16.03396	14.53	15.3432	-19.15	0.98850	13.4009	-13.29	63.061	5.7	6	715	1130.9	1546	429	932.3	1422	1342	18
323	19	Nie	059	16.07361	14.40	15.3842	-19.29	0.98830	14.2622	-18.23	62.671	6.7	2	717	1131.1	1545	545	1015.6	1434	1338	19
324	20	Pon	060	16.11327	14.26	15.4253	-19.43	0.98809	15.1550	-22.36	62.213	7.7	0	718	1131.3	1544	704	1102.4	1451	1334	20
325	21	Wto	061	16.15293	14.11	15.4704	-19.56	0.98789	16.0853	-25.52	61.715	0.5	0	720	1131.6	1543	824	1153.2	1515	1330	21
326	22	Śro	062	16.19258	13.56	15.5116	-20.09	0.98769	17.0515	-27.53	61.198	1.5	2	722	1131.8	1541	940	1247.6	1552	1326	22
327	23	Czw	063	16.23224	13.40	15.5529	-20.22	0.98749	18.0351	-28.25	60.678	2.5	7	724	1132.1	1540	1043	1344.5	1647	1322	23
328	24	Pią	064	16.27190	13.22	15.5943	-20.34	0.98730	19.0305	-27.22	60.163	3.5	13	725	1132.4	1539	1131	1442.0	1759	1318	24
329	25	Sob	065	16.31155	13.05	16.0357	-20.46	0.98711	20.0117	-24.45	59.657	4.5	21	727	1132.7	1538	1203	1538.1	1922	1314	25
330	26	Nie	066	16.35121	12.46	16.0812	-20.57	0.98692	20.5718	-20.43	59.162	5.5	30	729	1133.0	1537	1225	1631.7	2051	1311	26
331	27	Pon	067	16.39087	12.27	16.1228	-21.09	0.98673	21.5051	-15.32	58.687	6.5	41	730	1133.3	1536	1240	1722.5	2220	1307	27
332	28	Wto	068	16.43052	12.07	16.1645	-21.19	0.98655	22.4221	-9.30	58.245	0.2	52	732	1133.6	1535	1252	1811.3	2347	1303	28
333	29	Śro	069	16.47017	11.46	16.2102	-21.30	0.98637	23.3243	-2.55	57.861	1.2	63	733	1134.0	1534	1303	1859.2	****	1259	29
334	30	Czw	070	16.50583	11.25	16.2520	-21.40	0.98620	0.2308	3.53	57.566	2.2	74	735	1134.3	1533	1313	1947.5	115	1255	30

Fazy Księżyca [Dm, h.mm]: Pełn 5, 13.58 3kw 12, 18.45 Now 20, 23.18 1kw 28, 7.29

LISTOPAD 2006 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0 ^h UT)	
1	4.46	18.13	8.27	16.29	6.50	16.21	6.29	16.09	8.16	16.54	23.24	14.15	14.35	1.16	13.47	22.55	10.10	19.15		
	14.433	-14.46	15.408	-21.01	14.530	-14.06	14.249	-13.21	15.522	-18.29	9.776	14.47	22.849	-8.19	21.305	-15.93	17.653	-16.21	2.67626	1
3	4.49	18.09	8.09	16.22	6.57	16.18	6.29	16.04	8.10	16.48	23.17	14.07	14.27	1.08	13.39	22.47	10.03	19.07		
	14.564	-15.09	15.318	-20.21	14.693	-14.90	14.337	-13.68	15.551	-18.39	9.784	14.44	22.847	-8.20	21.305	-15.93	17.657	-16.22	2.80767	3
5	4.53	18.06	7.46	16.13	7.04	16.15	6.29	15.59	8.05	16.41	23.10	13.59	14.19	1.00	13.31	22.40	9.55	18.60		
	14.696	-15.71	15.192	-19.14	14.857	-15.71	14.425	-14.14	15.581	-18.50	9.791	14.41	22.845	-8.21	21.306	-15.93	17.661	-16.23	2.93909	5
7	4.56	18.03	7.20	16.05	7.11	16.12	6.29	15.53	7.60	16.34	23.02	13.52	14.11	0.52	13.23	22.32	9.48	18.52		
	14.828	-16.31	15.039	-17.84	15.022	-16.50	14.514	-14.59	15.611	-18.60	9.798	14.38	22.844	-8.22	21.306	-15.93	17.665	-16.25	3.07051	7
9	4.59	18.00	6.54	15.56	7.18	16.10	6.29	15.48	7.54	16.27	22.55	13.44	14.03	0.44	13.16	22.24	9.40	18.44		
	14.962	-16.89	14.876	-16.43	15.189	-17.25	14.603	-15.03	15.641	-18.71	9.805	14.35	22.842	-8.22	21.307	-15.92	17.669	-16.26	3.20194	9
11	5.02	17.58	6.29	15.47	7.25	16.07	6.29	15.43	7.49	16.21	22.48	13.37	13.55	0.36	13.08	22.16	9.32	18.37		
	15.097	-17.45	14.724	-15.06	15.357	-17.98	14.693	-15.47	15.671	-18.81	9.811	14.33	22.841	-8.23	21.308	-15.92	17.674	-16.27	3.33336	11
13	5.05	17.55	6.06	15.39	7.31	16.05	6.29	15.38	7.43	16.14	22.40	13.29	13.47	0.28	12.60	22.08	9.25	18.29		
	15.232	-17.99	14.603	-13.88	15.526	-18.67	14.784	-15.90	15.702	-18.92	9.817	14.30	22.840	-8.23	21.309	-15.92	17.678	-16.27	3.46478	13
15	5.08	17.53	5.49	15.32	7.38	16.03	6.30	15.33	7.38	16.07	22.33	13.21	13.39	0.20	12.52	22.01	9.17	18.21		
	15.369	-18.51	14.524	-13.01	15.697	-19.33	14.875	-16.33	15.732	-19.02	9.822	14.28	22.840	-8.24	21.310	-15.91	17.682	-16.28	3.59620	15
17	5.11	17.50	5.36	15.25	7.45	16.01	6.30	15.28	7.33	16.00	22.25	13.13	13.31	0.13	12.44	21.53	9.10	18.14		
	15.507	-19.01	14.492	-12.50	15.869	-19.95	14.966	-16.74	15.762	-19.12	9.827	14.26	22.839	-8.24	21.312	-15.90	17.687	-16.29	3.72762	17
19	5.14	17.48	5.28	15.19	7.51	15.60	6.30	15.23	7.27	15.54	22.18	13.06	13.24	0.05	12.37	21.45	9.02	18.06		
	15.645	-19.48	14.507	-12.36	16.043	-20.54	15.059	-17.15	15.793	-19.22	9.831	14.25	22.839	-8.24	21.313	-15.90	17.692	-16.30	3.85903	19
21	5.17	17.47	5.25	15.13	7.58	15.59	6.30	15.18	7.22	15.47	22.10	12.58	13.16	23.53	12.29	21.37	8.55	17.58		
	15.784	-19.93	14.563	-12.52	16.218	-21.09	15.151	-17.55	15.824	-19.32	9.835	14.24	22.839	-8.24	21.315	-15.89	17.696	-16.31	3.99046	21
23	5.20	17.45	5.25	15.09	8.04	15.58	6.30	15.14	7.17	15.40	22.03	12.50	13.08	23.45	12.21	21.30	8.47	17.51		
	15.925	-20.36	14.653	-12.94	16.394	-21.60	15.245	-17.93	15.854	-19.41	9.839	14.23	22.839	-8.23	21.317	-15.88	17.701	-16.32	4.12188	23
25	5.22	17.43	5.27	15.04	8.10	15.57	6.31	15.09	7.11	15.34	21.55	12.43	12.60	23.37	12.13	21.22	8.40	17.43		
	16.066	-20.77	14.770	-13.55	16.571	-22.06	15.339	-18.31	15.885	-19.51	9.842	14.22	22.840	-8.23	21.319	-15.87	17.706	-16.33	4.25330	25
27	5.25	17.42	5.32	15.00	8.16	15.57	6.31	15.04	7.06	15.27	21.47	12.35	12.52	23.29	12.05	21.14	8.32	17.35		
	16.208	-21.14	14.909	-14.29	16.750	-22.49	15.434	-18.68	15.916	-19.60	9.844	14.21	22.841	-8.22	21.321	-15.86	17.711	-16.34	4.38473	27
29	5.28	17.41	5.39	14.57	8.22	15.57	6.31	14.60	7.00	15.20	21.40	12.27	12.44	23.22	11.58	21.07	8.25	17.28		
	16.351	-21.49	15.064	-15.13	16.929	-22.86	15.529	-19.05	15.947	-19.70	9.846	14.21	22.841	-8.22	21.323	-15.85	17.715	-16.34	4.51614	29

GRUDZIEŃ 2006

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)											Czas strefowy [hhmm.]							
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2454																		
335	1	Pią	071	16.54549	11.03	16.2938	-21.49	0.98603	1.1452	10.34	57.398	3.2	84	736	1134.7	1533	1324	2037.7	244	1251	1
336	2	Sob	072	16.58514	10.40	16.3358	-21.58	0.98587	2.0904	16.44	57.390	4.2	91	738	1135.1	1532	1338	2131.1	415	1247	2
337	3	Nie	073	17.02480	10.17	16.3817	-22.07	0.98571	3.0631	21.56	57.569	5.2	97	739	1135.5	1531	1357	2228.2	549	1243	3
338	4	Pon	074	17.06445	9.53	16.4238	-22.15	0.98556	4.0713	25.48	57.942	6.2	100	741	1135.9	1531	1425	2328.5	723	1239	4
339	5	Wto	075	17.10411	9.28	16.4659	-22.23	0.98541	5.1002	27.58	58.497	0.4	100	742	1136.3	1530	1507	*****	848	1235	5
340	6	Śro	076	17.14377	9.03	16.5120	-22.30	0.98527	6.1255	28.19	59.198	1.4	97	743	1136.7	1530	1608	030.3	956	1231	6
341	7	Czw	077	17.18342	8.38	16.5542	-22.37	0.98514	7.1335	26.56	59.992	2.4	93	745	1137.1	1529	1723	130.7	1042	1227	7
342	8	Pią	078	17.22308	8.12	17.0005	-22.44	0.98501	8.1021	24.06	60.817	3.4	86	746	1137.5	1529	1845	227.4	1112	1223	8
343	9	Sob	079	17.26274	7.45	17.0428	-22.50	0.98489	9.0240	20.08	61.607	4.4	79	747	1138.0	1529	2006	319.3	1132	1219	9
344	10	Nie	080	17.30239	7.18	17.0851	-22.55	0.98477	9.5053	15.24	62.303	5.4	70	748	1138.4	1528	2124	406.4	1146	1215	10
345	11	Pon	081	17.34205	6.51	17.1315	-23.00	0.98466	10.3551	10.10	62.855	6.4	61	749	1138.9	1528	2238	449.6	1156	1212	11
346	12	Wto	082	17.38170	6.23	17.1740	-23.05	0.98455	11.1839	4.39	63.226	7.4	51	750	1139.4	1528	2350	530.0	1205	1208	12
347	13	Śro	083	17.42136	5.55	17.2204	-23.09	0.98445	12.0024	-0.58	63.396	0.9	42	751	1139.8	1528	****	609.0	1212	1204	13
348	14	Czw	084	17.46101	5.27	17.2629	-23.13	0.98435	12.4215	-6.33	63.362	1.9	33	752	1140.3	1528	101	647.8	1220	1200	14
349	15	Pią	085	17.50067	4.58	17.3055	-23.16	0.98426	13.2515	-11.57	63.137	2.9	24	753	1140.8	1528	213	727.7	1229	1156	15
350	16	Sob	086	17.54032	4.29	17.3520	-23.19	0.98417	14.1029	-16.58	62.746	3.9	17	754	1141.3	1528	327	809.7	1240	1152	16
351	17	Nie	087	17.57598	3.60	17.3946	-23.22	0.98408	14.5851	-21.24	62.228	4.9	10	755	1141.8	1529	445	855.0	1255	1148	17
352	18	Pon	088	18.01563	3.30	17.4412	-23.23	0.98400	15.5058	-24.58	61.626	5.9	5	756	1142.2	1529	605	944.4	1316	1144	18
353	19	Wto	089	18.05529	3.00	17.4839	-23.25	0.98392	16.4653	-27.23	60.988	6.9	1	756	1142.7	1529	723	1038.0	1348	1140	19
354	20	Śro	090	18.09495	2.30	17.5305	-23.26	0.98385	17.4549	-28.22	60.360	7.9	0	757	1143.2	1530	833	1135.0	1437	1136	20
355	21	Czw	091	18.13461	2.01	17.5731	-23.26	0.98378	18.4608	-27.43	59.780	0.9	1	757	1143.7	1530	927	1233.7	1545	1132	21
356	22	Pią	092	18.17426	1.31	18.0158	-23.26	0.98371	19.4555	-25.25	59.276	1.9	4	758	1144.2	1531	1004	1331.7	1707	1128	22
357	23	Sob	093	18.21392	1.01	18.0624	-23.26	0.98364	20.4335	-21.37	58.862	2.9	10	758	1144.7	1531	1029	1427.3	1837	1124	23
358	24	Nie	094	18.25357	0.31	18.1051	-23.25	0.98358	21.3826	-16.35	58.541	3.9	17	759	1145.2	1532	1047	1519.7	2007	1120	24
359	25	Pon	095	18.29323	0.01	18.1517	-23.24	0.98353	22.3039	-10.39	58.309	4.9	26	759	1145.7	1532	1100	1609.3	2135	1116	25
360	26	Wto	096	18.33288	-0.29	18.1944	-23.22	0.98348	23.2102	-4.10	58.157	5.9	37	759	1146.2	1533	1111	1657.1	2302	1113	26
361	27	Śro	097	18.37254	-0.58	18.2410	-23.19	0.98343	0.1045	2.32	58.076	6.9	48	800	1146.7	1534	1120	1744.3	****	1109	27
362	28	Czw	098	18.41220	-1.28	18.2836	-23.17	0.98339	1.0102	9.07	58.067	0.8	60	800	1147.2	1535	1131	1832.6	028	1105	28
363	29	Pią	099	18.45185	-1.57	18.3302	-23.13	0.98335	1.5308	15.16	58.132	1.8	70	800	1147.7	1536	1144	1923.2	157	1101	29
364	30	Sob	100	18.49151	-2.26	18.3727	-23.10	0.98332	2.4801	20.36	58.282	2.8	80	800	1148.2	1537	1200	2017.2	327	1057	30
365	31	Nie	101	18.53116	-2.55	18.4152	-23.06	0.98330	3.4607	24.46	58.528	3.8	88	800	1148.7	1538	1223	2114.6	459	1053	31

Fazy Księżyca [Dm, h.mm]: Pełn 5, 1.25 3kw 12, 15.32 Nów 20, 15.01 1kw 27, 15.48

GRUDZIEŃ 2006 (c.d.)

Świty, zmierny astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	5.30	17.40	5.46	14.53	8.27	15.57	6.31	14.55	6.55	15.14	21.32	12.19	12.36	23.14	11.50	20.59	8.17	17.20		
	16.494	-21.82	15.233	-16.01	17.110	-23.20	15.625	-19.40	15.977	-19.79	9.848	14.21	22.842	-8.21	21.325	-15.84	17.720	-16.35	4.64756	1
3	5.32	17.39	5.55	14.51	8.32	15.58	6.31	14.51	6.50	15.07	21.24	12.12	12.29	23.06	11.42	20.51	8.10	17.13		
	16.638	-22.11	15.412	-16.92	17.291	-23.48	15.721	-19.73	16.008	-19.88	9.849	14.21	22.844	-8.20	21.328	-15.83	17.725	-16.36	4.77898	3
5	5.35	17.39	6.04	14.48	8.37	15.59	6.32	14.47	6.44	15.00	21.16	12.04	12.21	22.58	11.34	20.44	8.02	17.05		
	16.783	-22.38	15.600	-17.82	17.473	-23.72	15.818	-20.06	16.039	-19.97	9.849	14.21	22.845	-8.19	21.330	-15.82	17.730	-16.37	4.91041	5
7	5.37	17.38	6.13	14.46	8.41	16.01	6.32	14.42	6.39	14.54	21.08	11.56	12.13	22.51	11.26	20.36	7.55	16.57		
	16.928	-22.62	15.794	-18.71	17.655	-23.91	15.916	-20.38	16.069	-20.05	9.849	14.22	22.847	-8.18	21.333	-15.81	17.735	-16.37	5.04183	7
9	5.39	17.38	6.23	14.45	8.46	16.03	6.32	14.38	6.33	14.47	21.00	11.48	12.05	22.43	11.19	20.29	7.47	16.50		
	17.074	-22.83	15.994	-19.56	17.838	-24.06	16.014	-20.69	16.100	-20.14	9.849	14.23	22.849	-8.16	21.336	-15.79	17.740	-16.38	5.17325	9
11	5.41	17.38	6.33	14.44	8.49	16.05	6.32	14.34	6.28	14.41	20.52	11.40	11.57	22.35	11.11	20.21	7.40	16.42		
	17.221	-23.01	16.198	-20.37	18.021	-24.15	16.113	-20.98	16.131	-20.22	9.848	14.24	22.851	-8.15	21.339	-15.78	17.745	-16.39	5.30468	11
13	5.42	17.38	6.43	14.43	8.53	16.08	6.32	14.30	6.22	14.34	20.44	11.32	11.50	22.28	11.03	20.13	7.32	16.35		
	17.368	-23.15	16.407	-21.13	18.205	-24.19	16.212	-21.26	16.161	-20.31	9.847	14.26	22.853	-8.13	21.342	-15.77	17.751	-16.39	5.43609	13
15	5.44	17.38	6.53	14.43	8.56	16.11	6.32	14.27	6.17	14.27	20.36	11.25	11.42	22.20	10.55	20.06	7.25	16.27		
	17.515	-23.27	16.619	-21.83	18.388	-24.18	16.312	-21.53	16.191	-20.39	9.845	14.27	22.856	-8.12	21.345	-15.75	17.756	-16.40	5.56751	15
17	5.46	17.39	7.02	14.43	8.59	16.15	6.32	14.23	6.11	14.21	20.28	11.17	11.34	22.13	10.48	19.58	7.17	16.19		
	17.663	-23.36	16.835	-22.46	18.572	-24.13	16.413	-21.79	16.222	-20.47	9.842	14.29	22.859	-8.10	21.349	-15.73	17.761	-16.40	5.69893	17
19	5.47	17.40	7.12	14.44	9.01	16.19	6.32	14.19	6.06	14.14	20.20	11.09	11.26	22.05	10.40	19.51	7.09	16.12		
	17.811	-23.42	17.053	-23.02	18.755	-24.02	16.514	-22.03	16.252	-20.54	9.840	14.32	22.861	-8.08	21.352	-15.72	17.766	-16.41	5.83036	19
21	5.48	17.40	7.21	14.46	9.03	16.23	6.32	14.16	6.00	14.08	20.12	11.01	11.18	21.57	10.32	19.43	7.02	16.04		
	17.959	-23.44	17.275	-23.52	18.938	-23.87	16.616	-22.26	16.282	-20.62	9.836	14.34	22.865	-8.06	21.356	-15.70	17.771	-16.41	5.96178	21
23	5.49	17.42	7.29	14.48	9.04	16.28	6.32	14.13	5.55	14.01	20.04	10.53	11.11	21.50	10.24	19.36	6.54	15.57		
	18.107	-23.43	17.499	-23.93	19.120	-23.66	16.718	-22.48	16.312	-20.69	9.833	14.37	22.868	-8.04	21.360	-15.68	17.776	-16.42	6.09321	23
25	5.50	17.43	7.38	14.52	9.05	16.33	6.31	14.10	5.49	13.54	19.55	10.45	11.03	21.42	10.17	19.28	6.47	15.49		
	18.255	-23.39	17.725	-24.26	19.301	-23.41	16.821	-22.68	16.342	-20.76	9.828	14.40	22.871	-8.02	21.363	-15.67	17.781	-16.42	6.22463	25
27	5.50	17.44	7.45	14.55	9.06	16.38	6.31	14.06	5.44	13.48	19.47	10.37	10.55	21.35	10.09	19.21	6.39	15.41		
	18.403	-23.32	17.953	-24.51	19.482	-23.10	16.924	-22.87	16.371	-20.83	9.824	14.43	22.875	-7.99	21.367	-15.65	17.786	-16.43	6.35604	27
29	5.51	17.46	7.52	15.00	9.06	16.43	6.31	14.03	5.38	13.41	19.39	10.29	10.47	21.27	10.01	19.13	6.32	15.34		
	18.550	-23.22	18.183	-24.67	19.662	-22.76	17.028	-23.04	16.400	-20.90	9.819	14.46	22.879	-7.97	21.371	-15.63	17.791	-16.43	6.48746	29
31	5.51	17.47	7.59	15.06	9.06	16.49	6.30	14.01	5.32	13.35	19.30	10.21	10.39	21.20	9.53	19.05	6.24	15.26		
	18.698	-23.09	18.415	-24.74	19.841	-22.36	17.132	-23.20	16.430	-20.97	9.813	14.49	22.883	-7.94	21.375	-15.61	17.796	-16.43	6.61889	31

Święta państwowe i kościelne w Polsce oraz inne ważniejsze dni w roku 2006

Nowy Rok	Nie	1 styczeń	Dzień Dziecka	Czw	1 czerwiec
Najświętszej Maryi Panny Rodzicielki	Nie	1 styczeń	Zesłania Ducha Świętego	Nie	4 czerwiec
Objawienia Pańskiego (Trzech Króli)	Pią	6 styczeń	Dzień Dziękczynienia	Nie	4 czerwiec
Juliański Nowy Rok	Sob	14 styczeń	Trójcy Najświętszej	Nie	11 czerwiec
Dzień Babci	Sob	21 styczeń	Boże Ciało	Czw	15 czerwiec
Dzień Dziadka	Nie	22 styczeń	Najświętszego Serca Pana Jezusa	Pią	23 czerwiec
Ofiarowania Pańskiego	Czw	2 luty	Dzień Ojca	Pią	23 czerwiec
Matki Boskiej Gromnicznej	Czw	2 luty	Noc Świętojańska	Pią	23 czerwiec
Walentynki	Wto	14 luty	Św. Piotra i Pawła	Czw	29 czerwiec
Święto UMK	Nie	19 luty	Wniebowzięcia N.M.P.	Wto	15 sierpień
Tłusty czwartek	Czw	23 luty	Święto Wojska Polskiego	Wto	15 sierpień
Środa Popielcowa	Śro	1 marzec	Dzień Solidarności i Wolności	Czw	31 sierpień
Dzień Kobiet	Śro	8 marzec	Dzień Programisty	Śro	13 wrzesień
Narodowy Dzień Życia	Pią	24 marzec	Dożynki – Święto Plonów	Sob	23 wrzesień
Niedziela Palmowa	Nie	9 kwiecień	Dzień Edukacji Narodowej	Sob	14 październik
Niedziela Wielkanocna	Nie	16 kwiecień	Dzień Papieski	Nie	15 październik
Niedziela Miłosierdzia Bożego	Nie	23 kwiecień	Dzień Papieża Jana Pawła II	Pon	16 październik
Święto Pracy	Pon	1 maj	Wszystkich Świętych	Śro	1 listopad
Dzień Flagi Rzeczypospolitej Polskiej	Wto	2 maj	Zaduszki	Czw	2 listopad
Najświętsza Maryja Królowa Polski	Śro	3 maj	Święto Niepodległości	Sob	11 listopad
Święto Konstytucji 3 Maja	Śro	3 maj	Pierwsza niedziela Adventu	Nie	3 grudzień
Dzień Polskiej Niezapominajki	Pon	15 maj	Niepokalane Poczęcie N.M.P.	Pią	8 grudzień
Wniebowstąpienia Pańskiego	Czw	25 maj	Boże Narodzenie	Pon	25 grudzień
Dzień Matki	Pią	26 maj	Sylwester	Nie	31 grudzień

Kalendarz astronomiczny 2007

PIWNICE, CA UMK

Współrzędne geograficzne: 18.5641°E 53.0955°N, Nr strefy czasowej (> 0 , gdy na wschód) = 1 (CSE)

Kalendarz jest gregoriańskim i jest oparty na efemerydach Układu Słonecznego obliczanych z dokładnością 1' (Słońce 2'', Księżyc 10'', Pluton 15'). Czas gwiazdowy ma dokładność około 0.1 s. Wschody i zachody obliczono z uwzględnieniem horyzontalnej refrakcji astronomicznej (34'), rozciągłości Słońca lub Księżyca i paralaksy horyzontalnej Księżyca. Dla dat odległych o więcej niż ok. 300 lat od roku 1950 dokładności położenia planet są gorsze niż 1'!
(Kalendarz ten opracowano [KMB] w Katedrze Radioastronomii CA UMK, Toruń—Piwnice. Oblicz. dnia 7.10.2010 r.)

Data Wielkanocy: **2007 KWIECIEŃ 8**

Dla całego roku przyjęto: TDT – UT = 65 s

Pory roku [miesiąc dzień, godz. mm] (czas zimowy): Wiosna **III 21, 1.07**, Lato **VI 21, 19.06**, Jesień **IX 23, 10.51**, Zima **XII 22, 7.07**

Dane w czasie letnim odróżniono kolorem brązowym; czas ten obowiązuje **od 25 marca do 28 października 2007 r.**

Oznaczenia:

Dr — dzień 2007 roku (1 stycznia Dr = 1)

Dm — dzień miesiąca

Dt — dzień tygodnia

JD — data juliańska modulo 1000 o 12^h UT

(po nagłówku: Entier(JD/1000) dla Dm = 1)

ST — prawdziwy czas gwiazdowy

$\Delta\alpha$ — różnica czasu (czas słoneczny prawdziwy minus średni)

α — rektascensja (Słońca lub Księżyca)

δ — deklinacja (Słońca lub Księżyca)

R — odległość (Słońca lub Księżyca)

j astr — jednostka astronomiczna

ρ_{\oplus} — promień Ziemi

Faza \leftarrow dni po kwadrze i % oświetlonej części tarczy Księżyca

Wsch — wschód (Słońca, Księżyca lub planety)

Gór — górowanie czyli tranzyt (Gal. = centrum Galaktyki)

Zach — zachód (Słońca, Księżyca lub planety)

STYCZEŃ 2007

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2454																		
1	1	Pon	102	18.57082	-3.23	18.4618	-23.01	0.98328	4.4658	27.26	58.882	4.8	95	800	1149.1	1539	1258	2214.7	626	1049	1
2	2	Wto	103	19.01048	-3.51	18.5042	-22.56	0.98327	5.4903	28.24	59.342	5.8	98	800	1149.6	1540	1350	2315.1	740	1045	2
3	3	Śro	104	19.05013	-4.19	18.5507	-22.50	0.98326	6.5013	27.36	59.899	6.8	100	759	1150.1	1541	1459	*****	834	1041	3
4	4	Czw	105	19.08579	-4.47	18.5930	-22.44	0.98326	7.4830	25.15	60.528	0.9	99	759	1150.5	1542	1619	013.4	911	1037	4
5	5	Pią	106	19.12544	-5.14	19.0354	-22.38	0.98327	8.4247	21.37	61.191	1.9	96	759	1151.0	1543	1742	107.6	934	1033	5
6	6	Sob	107	19.16510	-5.40	19.0817	-22.31	0.98328	9.3255	17.04	61.843	2.9	91	758	1151.4	1545	1902	157.3	951	1029	6
7	7	Nie	108	19.20476	-6.06	19.1240	-22.23	0.98330	10.1927	11.54	62.433	3.9	85	758	1151.9	1546	2019	242.6	1002	1025	7
8	8	Pon	109	19.24441	-6.32	19.1702	-22.16	0.98333	11.0320	6.23	62.914	4.9	77	757	1152.3	1547	2133	324.6	1012	1021	8
9	9	Wto	110	19.28407	-6.57	19.2124	-22.07	0.98336	11.4538	0.44	63.243	5.9	69	757	1152.7	1549	2244	404.4	1020	1018	9
10	10	Śro	111	19.32372	-7.22	19.2545	-21.59	0.98340	12.2725	-4.54	63.388	6.9	60	756	1153.1	1550	2356	443.4	1027	1014	10
11	11	Czw	112	19.36338	-7.46	19.3006	-21.50	0.98344	13.0949	-10.22	63.332	7.9	51	756	1153.5	1552	****	522.6	1036	1010	11
12	12	Pią	113	19.40303	-8.09	19.3426	-21.40	0.98349	13.5353	-15.29	63.071	0.9	41	755	1153.9	1553	109	603.3	1046	1006	12
13	13	Sob	114	19.44269	-8.32	19.3845	-21.30	0.98354	14.4038	-20.05	62.618	1.9	32	754	1154.3	1555	224	646.6	1058	1002	13
14	14	Nie	115	19.48234	-8.55	19.4304	-21.20	0.98360	15.3053	-23.56	62.004	2.9	23	753	1154.7	1556	342	733.7	1116	958	14
15	15	Pon	116	19.52200	-9.16	19.4722	-21.09	0.98366	16.2504	-26.46	61.274	3.9	15	752	1155.0	1558	501	825.0	1142	954	15
16	16	Wto	117	19.56166	-9.37	19.5140	-20.58	0.98373	17.2254	-28.16	60.481	4.9	9	751	1155.4	1600	616	920.6	1223	950	16
17	17	Śro	118	20.00131	-9.58	19.5557	-20.46	0.98379	18.2312	-28.12	59.689	5.9	4	750	1155.7	1601	717	1019.0	1323	946	17
18	18	Czw	119	20.04097	-10.17	20.0013	-20.34	0.98387	19.2407	-26.26	58.961	6.9	1	749	1156.0	1603	802	1118.4	1442	942	18
19	19	Pią	120	20.08063	-10.36	20.0429	-20.22	0.98394	20.2346	-23.02	58.350	0.3	0	748	1156.4	1605	832	1216.3	1612	938	19
20	20	Sob	121	20.12028	-10.55	20.0843	-20.09	0.98402	21.2057	-18.12	57.898	1.3	2	747	1156.7	1607	852	1311.5	1745	934	20
21	21	Nie	122	20.15594	-11.12	20.1257	-19.56	0.98411	22.1522	-12.19	57.625	2.3	7	746	1156.9	1608	907	1403.6	1917	930	21
22	22	Pon	123	20.19559	-11.29	20.1711	-19.42	0.98419	23.0731	-5.44	57.530	3.3	14	745	1157.2	1610	918	1453.3	2046	926	22
23	23	Wto	124	20.23525	-11.45	20.2123	-19.29	0.98428	23.5822	1.07	57.596	4.3	23	744	1157.5	1612	929	1541.7	2215	922	23
24	24	Śro	125	20.27490	-11.60	20.2535	-19.14	0.98438	0.4908	7.52	57.793	5.3	33	742	1157.7	1614	939	1630.2	2344	919	24
25	25	Czw	126	20.31456	-12.14	20.2945	-18.60	0.98448	1.4100	14.10	58.090	6.3	44	741	1158.0	1616	951	1720.2	****	915	25
26	26	Pią	127	20.35421	-12.28	20.3356	-18.45	0.98458	2.3459	19.41	58.455	0.5	56	739	1158.2	1618	1005	1812.7	114	911	26
27	27	Sob	128	20.39387	-12.40	20.3805	-18.30	0.98469	3.3138	24.04	58.867	1.5	67	738	1158.4	1619	1026	1908.2	244	907	27
28	28	Nie	129	20.43353	-12.52	20.4213	-18.14	0.98480	4.3048	27.03	59.310	2.5	77	737	1158.6	1621	1056	2006.3	412	903	28
29	29	Pon	130	20.47318	-13.03	20.4621	-17.58	0.98492	5.3127	28.25	59.779	3.5	85	735	1158.8	1623	1140	2105.5	530	859	29
30	30	Wto	131	20.51284	-13.13	20.5027	-17.42	0.98505	6.3150	28.06	60.270	4.5	92	733	1159.0	1625	1242	2203.5	630	855	30
31	31	Śro	132	20.55249	-13.23	20.5433	-17.25	0.98518	7.3006	26.12	60.781	5.5	97	732	1159.1	1627	1358	2258.5	711	851	31

Fazy Księżyca [Dm, h.mm]: Pełn 3, 14.57 3kw 11, 13.45 Now 19, 5.01 1kw 26, 0.01

STYCZEŃ 2007 (c.d.)

Świty, zmiernicy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0 ^h UT)	
1	5.51	17.48	8.02	15.09	9.06	16.52	6.30	13.59	5.29	13.31	19.26	10.17	10.36	21.16	9.49	19.02	6.20	15.23		
	18.772	-23.01	18.532	-24.74	19.930	-22.15	17.184	-23.27	16.444	-21.00	9.810	14.51	22.885	-7.93	21.378	-15.60	17.799	-16.43	6.68460	1
3	5.51	17.50	8.08	15.15	9.05	16.58	6.30	13.57	5.24	13.25	19.17	10.09	10.28	21.09	9.42	18.54	6.13	15.15		
	18.918	-22.84	18.766	-24.67	20.107	-21.69	17.289	-23.41	16.473	-21.07	9.804	14.55	22.889	-7.90	21.382	-15.58	17.804	-16.44	6.81602	3
5	5.51	17.52	8.13	15.23	9.05	17.04	6.29	13.54	5.18	13.18	19.09	10.01	10.20	21.01	9.34	18.47	6.05	15.07		
	19.065	-22.63	19.001	-24.51	20.282	-21.18	17.394	-23.53	16.501	-21.13	9.798	14.59	22.894	-7.87	21.386	-15.56	17.809	-16.44	6.94745	5
7	5.51	17.54	8.17	15.31	9.03	17.11	6.28	13.52	5.12	13.12	19.00	9.53	10.12	20.54	9.26	18.39	5.58	14.60		
	19.211	-22.39	19.238	-24.24	20.457	-20.64	17.499	-23.63	16.530	-21.19	9.791	14.63	22.899	-7.84	21.390	-15.54	17.814	-16.44	7.07887	7
9	5.50	17.57	8.20	15.40	9.02	17.17	6.27	13.50	5.06	13.05	18.52	9.45	10.05	20.46	9.19	18.32	5.50	14.52		
	19.357	-22.12	19.475	-23.88	20.630	-20.05	17.605	-23.72	16.558	-21.25	9.783	14.68	22.903	-7.81	21.395	-15.52	17.819	-16.44	7.21029	9
11	5.49	17.59	8.23	15.50	9.00	17.24	6.26	13.48	5.01	12.58	18.43	9.37	9.57	20.39	9.11	18.24	5.43	14.45		
	19.502	-21.83	19.712	-23.42	20.801	-19.43	17.712	-23.80	16.585	-21.31	9.776	14.72	22.908	-7.78	21.399	-15.50	17.824	-16.44	7.34170	11
13	5.48	18.02	8.25	16.01	8.58	17.30	6.25	13.46	4.55	12.52	18.35	9.29	9.49	20.32	9.03	18.17	5.35	14.37		
	19.646	-21.50	19.949	-22.85	20.972	-18.76	17.818	-23.85	16.613	-21.36	9.768	14.77	22.913	-7.75	21.404	-15.48	17.828	-16.45	7.47312	13
15	5.47	18.04	8.27	16.12	8.56	17.37	6.24	13.44	4.49	12.45	18.26	9.21	9.41	20.24	8.55	18.09	5.28	14.29		
	19.790	-21.15	20.186	-22.18	21.140	-18.07	17.925	-23.90	16.640	-21.41	9.760	14.82	22.919	-7.71	21.409	-15.46	17.833	-16.45	7.60455	15
17	5.46	18.07	8.27	16.24	8.53	17.44	6.23	13.42	4.43	12.39	18.17	9.13	9.34	20.17	8.48	18.02	5.20	14.22		
	19.932	-20.77	20.422	-21.41	21.308	-17.34	18.032	-23.92	16.666	-21.47	9.751	14.87	22.924	-7.68	21.413	-15.44	17.838	-16.45	7.73597	17
19	5.45	18.10	8.27	16.36	8.50	17.51	6.22	13.41	4.37	12.32	18.09	9.05	9.26	20.10	8.40	17.55	5.12	14.14		
	20.075	-20.36	20.656	-20.53	21.473	-16.57	18.139	-23.93	16.693	-21.52	9.742	14.92	22.930	-7.64	21.418	-15.41	17.842	-16.45	7.86739	19
21	5.43	18.13	8.27	16.49	8.48	17.58	6.20	13.39	4.31	12.25	17.60	8.57	9.18	20.02	8.32	17.47	5.05	14.07		
	20.216	-19.93	20.889	-19.55	21.638	-15.78	18.247	-23.92	16.719	-21.56	9.733	14.97	22.935	-7.61	21.423	-15.39	17.847	-16.45	7.99882	21
23	5.41	18.15	8.26	17.02	8.44	18.04	6.18	13.38	4.25	12.19	17.51	8.49	9.10	19.55	8.25	17.40	4.57	13.59		
	20.356	-19.48	21.118	-18.48	21.801	-14.96	18.354	-23.90	16.744	-21.61	9.724	15.02	22.941	-7.57	21.428	-15.37	17.851	-16.45	8.13023	23
25	5.39	18.18	8.24	17.15	8.41	18.11	6.17	13.37	4.19	12.12	17.42	8.40	9.03	19.48	8.17	17.32	4.50	13.51		
	20.496	-19.00	21.343	-17.31	21.962	-14.11	18.462	-23.86	16.770	-21.66	9.714	15.08	22.947	-7.53	21.433	-15.35	17.855	-16.45	8.26165	25
27	5.37	18.22	8.21	17.28	8.38	18.18	6.15	13.36	4.13	12.05	17.34	8.32	8.55	19.40	8.09	17.25	4.42	13.44		
	20.635	-18.49	21.562	-16.06	22.122	-13.23	18.570	-23.80	16.794	-21.70	9.704	15.13	22.953	-7.50	21.437	-15.32	17.860	-16.45	8.39307	27
29	5.35	18.25	8.18	17.40	8.34	18.25	6.13	13.35	4.07	11.59	17.25	8.24	8.47	19.33	8.01	17.17	4.34	13.36		
	20.772	-17.97	21.773	-14.74	22.281	-12.34	18.678	-23.73	16.819	-21.74	9.694	15.18	22.959	-7.46	21.442	-15.30	17.864	-16.45	8.52449	29
31	5.32	18.28	8.14	17.53	8.30	18.32	6.11	13.34	4.01	11.52	17.16	8.16	8.40	19.26	7.54	17.10	4.27	13.29		
	20.909	-17.42	21.973	-13.37	22.439	-11.42	18.786	-23.64	16.842	-21.78	9.684	15.24	22.966	-7.42	21.447	-15.28	17.868	-16.45	8.65592	31

LUTY 2007

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2454																		
32	1	Czw	133	20.59215	-13.31	20.5838	-17.08	0.98531	8.2460	22.57	61.306	6.5	99	730	1159.3	1629	1520	2349.4	738	847	1
33	2	Pią	134	21.03181	-13.39	21.0243	-16.51	0.98545	9.1605	18.39	61.830	0.2	100	729	1159.4	1631	1642	*****	756	843	2
34	3	Sob	135	21.07146	-13.46	21.0646	-16.34	0.98560	10.0339	13.38	62.332	1.2	99	727	1159.5	1633	1800	036.1	809	839	3
35	4	Nie	136	21.11112	-13.52	21.1049	-16.16	0.98575	10.4824	8.10	62.784	2.2	95	725	1159.6	1635	1915	119.4	819	835	4
36	5	Pon	137	21.15077	-13.57	21.1451	-15.58	0.98591	11.3116	2.30	63.151	3.2	90	723	1159.7	1637	2028	200.1	828	831	5
37	6	Wto	138	21.19043	-14.02	21.1852	-15.40	0.98607	12.1316	-3.12	63.399	4.2	84	722	1159.8	1639	2139	239.5	835	827	6
38	7	Śro	139	21.23008	-14.05	21.2252	-15.21	0.98624	12.5524	-8.45	63.496	5.2	77	720	1159.8	1641	2252	318.5	843	824	7
39	8	Czw	140	21.26574	-14.08	21.2651	-15.02	0.98642	13.3839	-13.60	63.417	6.2	68	718	1159.9	1643	****	358.4	852	820	8
40	9	Pią	141	21.30539	-14.10	21.3050	-14.43	0.98660	14.2401	-18.45	63.145	7.2	59	716	1159.9	1644	006	440.2	903	816	9
41	10	Sob	142	21.34505	-14.12	21.3448	-14.24	0.98678	15.1220	-22.50	62.679	0.0	50	714	1159.9	1646	122	525.0	918	812	10
42	11	Nie	143	21.38470	-14.12	21.3845	-14.04	0.98696	16.0412	-26.00	62.034	1.0	40	712	1160.0	1648	240	613.6	940	808	11
43	12	Pon	144	21.42436	-14.12	21.4242	-13.44	0.98715	16.5942	-27.60	61.241	2.0	30	710	1159.9	1650	356	706.2	1013	804	12
44	13	Wto	145	21.46402	-14.11	21.4637	-13.24	0.98735	17.5812	-28.33	60.348	3.0	21	708	1159.9	1652	503	802.4	1102	800	13
45	14	Śro	146	21.50367	-14.10	21.5032	-13.04	0.98754	18.5821	-27.29	59.419	4.0	13	706	1159.9	1654	554	900.8	1212	756	14
46	15	Czw	147	21.54333	-14.07	21.5427	-12.44	0.98774	19.5826	-24.44	58.526	5.0	7	704	1159.9	1656	630	959.3	1337	752	15
47	16	Pią	148	21.58298	-14.04	21.5820	-12.23	0.98794	20.5659	-20.25	57.747	6.0	2	702	1159.8	1658	655	1056.2	1510	748	16
48	17	Sob	149	22.02264	-14.01	22.0213	-12.02	0.98814	21.5318	-14.49	57.149	7.0	0	700	1159.8	1700	712	1150.6	1645	744	17
49	18	Nie	150	22.06230	-13.56	22.0605	-11.41	0.98835	22.4730	-8.17	56.782	0.8	1	658	1159.7	1702	725	1242.6	1818	740	18
50	19	Pon	151	22.10195	-13.51	22.0956	-11.20	0.98856	23.4016	-1.15	56.669	1.8	5	656	1159.6	1704	736	1333.1	1950	736	19
51	20	Wto	152	22.14160	-13.45	22.1347	-10.58	0.98877	0.3241	5.50	56.803	2.8	11	654	1159.5	1706	746	1423.3	2122	732	20
52	21	Śro	153	22.18126	-13.39	22.1737	-10.37	0.98898	1.2550	12.33	57.154	3.8	19	652	1159.4	1708	758	1514.4	2255	728	21
53	22	Czw	154	22.22091	-13.31	22.2126	-10.15	0.98919	2.2041	18.29	57.669	4.8	29	650	1159.3	1710	812	1607.5	****	725	22
54	23	Pią	155	22.26057	-13.24	22.2515	-9.53	0.98941	3.1749	23.16	58.293	5.8	40	647	1159.1	1712	830	1703.3	029	721	23
55	24	Sob	156	22.30023	-13.15	22.2903	-9.31	0.98963	4.1707	26.38	58.971	0.1	51	645	1159.0	1714	857	1801.3	200	717	24
56	25	Nie	157	22.33588	-13.06	22.3251	-9.09	0.98985	5.1740	28.22	59.658	1.1	62	643	1158.8	1716	937	1900.3	322	713	25
57	26	Pon	158	22.37554	-12.56	22.3638	-8.46	0.99008	6.1754	28.25	60.322	2.1	72	641	1158.7	1717	1033	1958.4	427	709	26
58	27	Wto	159	22.41519	-12.46	22.4024	-8.24	0.99031	7.1608	26.52	60.944	3.1	81	639	1158.5	1719	1145	2053.6	513	705	27
59	28	Śro	160	22.45485	-12.35	22.4410	-8.01	0.99054	8.1108	23.57	61.515	4.1	88	636	1158.3	1721	1305	2145.1	543	701	28

Fazy Księżyca [Dm, h.mm]: Pełn 2, 6.45 3kw 10, 10.51 Nów 17, 17.14 1kw 24, 8.56

LUTY 2007 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	5.31	18.30	8.12	17.59	8.28	18.35	6.10	13.34	3.58	11.48	17.12	8.12	8.36	19.22	7.50	17.06	4.23	13.25		
	20.977	-17.14	22.068	-12.68	22.517	-10.95	18.840	-23.59	16.854	-21.80	9.679	15.27	22.969	-7.40	21.450	-15.27	17.870	-16.45	8.72163	1
3	5.28	18.33	8.06	18.09	8.25	18.42	6.07	13.34	3.51	11.42	17.03	8.04	8.28	19.15	7.42	16.59	4.15	13.17		
	21.113	-16.56	22.247	-11.28	22.673	-10.00	18.948	-23.47	16.877	-21.84	9.669	15.32	22.975	-7.36	21.455	-15.24	17.874	-16.45	8.85305	3
5	5.25	18.36	8.00	18.19	8.21	18.49	6.05	13.33	3.45	11.35	16.54	7.56	8.20	19.08	7.34	16.51	4.08	13.10		
	21.247	-15.97	22.404	-9.91	22.828	-9.04	19.056	-23.34	16.900	-21.87	9.658	15.38	22.982	-7.32	21.460	-15.22	17.878	-16.44	8.98447	5
7	5.22	18.39	7.53	18.26	8.17	18.56	6.02	13.33	3.39	11.28	16.45	7.48	8.13	19.00	7.27	16.44	3.60	13.02		
	21.381	-15.35	22.537	-8.62	22.981	-8.05	19.164	-23.19	16.922	-21.91	9.648	15.44	22.988	-7.28	21.465	-15.20	17.881	-16.44	9.11588	7
9	5.19	18.43	7.45	18.30	8.12	19.02	5.60	13.33	3.33	11.21	16.36	7.39	8.05	18.53	7.19	16.37	3.52	12.54		
	21.514	-14.72	22.638	-7.46	23.134	-7.06	19.271	-23.03	16.944	-21.94	9.637	15.49	22.995	-7.23	21.470	-15.17	17.885	-16.44	9.24730	9
11	5.16	18.46	7.36	18.32	8.08	19.09	5.57	13.33	3.26	11.15	16.27	7.31	7.57	18.46	7.11	16.29	3.45	12.47		
	21.646	-14.07	22.702	-6.49	23.286	-6.05	19.379	-22.84	16.965	-21.97	9.627	15.55	23.001	-7.19	21.475	-15.15	17.888	-16.44	9.37872	11
13	5.12	18.50	7.25	18.29	8.04	19.16	5.54	13.33	3.20	11.08	16.19	7.23	7.50	18.39	7.04	16.22	3.37	12.39		
	21.777	-13.41	22.726	-5.76	23.437	-5.03	19.487	-22.65	16.985	-22.00	9.616	15.60	23.008	-7.15	21.480	-15.13	17.892	-16.44	9.51015	13
15	5.08	18.53	7.14	18.23	7.59	19.22	5.51	13.33	3.13	11.01	16.10	7.15	7.42	18.31	6.56	16.14	3.29	12.31		
	21.907	-12.73	22.707	-5.33	23.588	-4.01	19.594	-22.43	17.005	-22.03	9.605	15.66	23.015	-7.11	21.485	-15.10	17.895	-16.43	9.64157	15
17	5.05	18.57	7.02	18.12	7.55	19.29	5.48	13.33	3.07	10.54	16.01	7.07	7.34	18.24	6.48	16.07	3.22	12.24		
	22.037	-12.03	22.647	-5.21	23.738	-2.97	19.701	-22.21	17.024	-22.05	9.595	15.71	23.022	-7.06	21.490	-15.08	17.898	-16.43	9.77299	17
19	5.01	19.00	6.49	17.57	7.51	19.36	5.45	13.33	3.00	10.47	15.52	6.59	7.27	18.17	6.41	15.59	3.14	12.16		
	22.166	-11.33	22.552	-5.41	23.887	-1.94	19.808	-21.96	17.043	-22.08	9.584	15.77	23.029	-7.02	21.495	-15.06	17.901	-16.43	9.90440	19
21	4.57	19.04	6.37	17.39	7.46	19.42	5.41	13.34	2.54	10.40	15.43	6.50	7.19	18.10	6.33	15.52	3.06	12.08		
	22.294	-10.61	22.430	-5.90	0.036	-0.89	19.915	-21.70	17.061	-22.10	9.574	15.82	23.036	-6.98	21.500	-15.03	17.904	-16.42	10.03582	21
23	4.53	19.08	6.25	17.20	7.42	19.49	5.38	13.34	2.47	10.33	15.34	6.42	7.11	18.03	6.25	15.45	2.58	12.01		
	22.421	-9.88	22.295	-6.61	0.185	0.15	20.022	-21.43	17.078	-22.12	9.564	15.87	23.043	-6.93	21.504	-15.01	17.907	-16.42	10.16724	23
25	4.48	19.11	6.13	16.59	7.37	19.55	5.34	13.35	2.40	10.26	15.26	6.34	7.04	17.55	6.17	15.37	2.51	11.53		
	22.547	-9.14	22.160	-7.47	0.333	1.20	20.128	-21.14	17.094	-22.14	9.554	15.92	23.050	-6.89	21.509	-14.99	17.909	-16.42	10.29866	25
27	4.44	19.15	6.03	16.39	7.33	20.02	5.31	13.35	2.33	10.19	15.17	6.26	6.56	17.48	6.10	15.30	2.43	11.45		
	22.673	-8.40	22.037	-8.38	0.482	2.24	20.234	-20.83	17.110	-22.16	9.544	15.97	23.057	-6.85	21.514	-14.96	17.912	-16.41	10.43008	27

MARZEC 2007

Piwnice, CA UMK				← Dane na godz. 12 czasu strefowego (= 11 lub 10 ^h UT) →											Czas strefowy [hhmm.]						
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
60	1	Czw	161	22.49450	-12.24	22.4755	-7.38	0.99078	9.0229	19.57	62.029	5.1	94	634	1158.1	1723	1426	2232.4	604	657	1
61	2	Pią	162	22.53416	-12.12	22.5140	-7.16	0.99102	9.5022	15.09	62.486	6.1	98	632	1158.0	1725	1544	2316.3	618	653	2
62	3	Sob	163	22.57382	-11.60	22.5524	-6.53	0.99126	10.3528	9.49	62.882	7.1	100	630	1157.7	1727	1700	2357.6	628	649	3
63	4	Nie	164	23.01347	-11.47	22.5908	-6.30	0.99151	11.1836	4.11	63.209	0.5	100	627	1157.5	1729	1813	*****	637	645	4
64	5	Pon	165	23.05313	-11.34	23.0251	-6.06	0.99176	12.0043	-1.32	63.455	1.5	98	625	1157.3	1731	1925	037.2	645	641	5
65	6	Wto	166	23.09278	-11.20	23.0634	-5.43	0.99202	12.4244	-7.10	63.600	2.5	94	623	1157.1	1733	2037	116.3	652	637	6
66	7	Śro	167	23.13243	-11.06	23.1016	-5.20	0.99228	13.2536	-12.32	63.625	3.5	89	620	1156.8	1734	2151	155.8	701	633	7
67	8	Czw	168	23.17209	-10.51	23.1358	-4.57	0.99254	14.1009	-17.27	63.508	4.5	83	618	1156.6	1736	2306	236.7	711	629	8
68	9	Pią	169	23.21175	-10.36	23.1740	-4.33	0.99281	14.5712	-21.44	63.231	5.5	75	616	1156.4	1738	****	320.1	724	626	9
69	10	Sob	170	23.25140	-10.21	23.2121	-4.10	0.99307	15.4718	-25.10	62.784	6.5	67	613	1156.1	1740	023	406.6	742	622	10
70	11	Nie	171	23.29106	-10.06	23.2502	-3.46	0.99335	16.4040	-27.31	62.166	7.5	57	611	1155.8	1742	139	456.7	809	618	11
71	12	Pon	172	23.33071	-9.50	23.2843	-3.23	0.99362	17.3655	-28.34	61.393	0.3	47	609	1155.6	1744	248	550.2	850	614	12
72	13	Wto	173	23.37037	-9.34	23.3223	-2.59	0.99389	18.3504	-28.08	60.497	1.3	37	606	1155.3	1745	345	646.1	949	610	13
73	14	Śro	174	23.41002	-9.17	23.3604	-2.35	0.99417	19.3346	-26.06	59.527	2.3	27	604	1155.0	1747	427	743.1	1106	606	14
74	15	Czw	175	23.44568	-9.01	23.3944	-2.12	0.99444	20.3143	-22.30	58.548	3.3	18	601	1154.8	1749	456	839.4	1234	602	15
75	16	Pią	176	23.48534	-8.44	23.4323	-1.48	0.99472	21.2807	-17.30	57.641	4.3	10	559	1154.5	1751	515	934.0	1406	558	16
76	17	Sob	177	23.52499	-8.27	23.4703	-1.24	0.99500	22.2251	-11.22	56.888	5.3	4	557	1154.2	1753	530	1026.8	1540	554	17
77	18	Nie	178	23.56465	-8.10	23.5042	-1.00	0.99528	23.1626	-4.28	56.362	6.3	1	554	1153.9	1755	542	1118.3	1714	550	18
78	19	Pon	179	24.00430	-7.52	23.5421	-0.37	0.99555	0.0946	2.46	56.116	0.3	0	552	1153.6	1756	553	1209.4	1848	546	19
79	20	Wto	180	0.04395	-7.35	23.5800	-0.13	0.99583	1.0355	9.52	56.170	1.3	3	549	1153.3	1758	604	1301.5	2023	542	20
80	21	Śro	181	0.08361	-7.17	0.0139	0.11	0.99611	1.5953	16.22	56.509	2.3	8	547	1153.0	1800	617	1355.6	2200	538	21
81	22	Czw	182	0.12326	-6.59	0.0518	0.34	0.99638	2.5817	21.48	57.089	3.3	16	545	1152.7	1802	634	1452.5	2336	534	22
82	23	Pią	183	0.16292	-6.41	0.0856	0.58	0.99666	3.5902	25.47	57.843	4.3	25	542	1152.4	1804	658	1551.9	****	531	23
83	24	Sob	184	0.20258	-6.23	0.1235	1.22	0.99694	5.0111	28.03	58.696	5.3	36	540	1152.1	1805	733	1652.6	106	527	24
84	25	Nie	185	0.24223	-6.05	0.1613	1.45	0.99721	6.0259	28.32	59.579	6.3	47	537	1151.8	1807	826	1752.5	220	523	25
84	25	Nie	185	23.24125	-6.06	0.1604	1.44	0.99720	6.0026	28.33	59.542	7.3	46	637	1251.8	1907	926	1852.5	320	623	25
85	26	Pon	186	23.28090	-5.48	0.1943	2.08	0.99748	7.0009	27.26	60.398	0.7	57	635	1251.5	1909	1034	1949.5	413	619	26
86	27	Wto	187	23.32056	-5.30	0.2321	2.32	0.99776	7.5624	24.51	61.184	1.7	67	633	1251.2	1911	1153	2042.3	448	615	27
87	28	Śro	188	23.36021	-5.11	0.2659	2.55	0.99804	8.4839	21.08	61.873	2.7	76	630	1250.9	1913	1314	2130.7	511	611	28
88	29	Czw	189	23.39587	-4.53	0.3038	3.18	0.99832	9.3709	16.33	62.451	3.7	84	628	1250.6	1914	1433	2215.2	526	607	29
89	30	Pią	190	23.43553	-4.35	0.3416	3.42	0.99860	10.2235	11.23	62.915	4.7	90	625	1250.3	1916	1548	2256.8	538	603	30
90	31	Sob	191	23.47518	-4.17	0.3755	4.05	0.99888	11.0553	5.53	63.268	5.7	95	623	1250.0	1918	1702	2336.6	547	559	31

Fazy Księżyca [Dm, h.mm]: Pełn 4, 0.17 3kw 12, 4.54 Nów 19, 3.43 1kw 25, 20.16

MARZEC 2007 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST		Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)		
1	4.40	19.19	5.54	16.20	7.28	20.09	5.27	13.36	2.27	10.12	15.08	6.18	6.48	17.41	6.02	15.22	2.35	11.38			
	22.799	-7.64	21.937	-9.28	0.630	3.28	20.339	-20.51	17.126	-22.18	9.534	16.02	23.064	-6.80	21.519	-14.94	17.914	-16.41	10.56	150	1
3	4.35	19.23	5.47	16.03	7.23	20.15	5.23	13.37	2.20	10.05	14.59	6.10	6.40	17.34	5.54	15.15	2.27	11.30			
	22.923	-6.88	21.863	-10.09	0.778	4.32	20.444	-20.18	17.140	-22.20	9.525	16.07	23.071	-6.76	21.524	-14.92	17.916	-16.41	10.69	292	3
5	4.30	19.27	5.40	15.49	7.19	20.22	5.19	13.37	2.13	9.58	14.51	6.02	6.33	17.27	5.47	15.07	2.20	11.22			
	23.047	-6.11	21.820	-10.80	0.927	5.35	20.549	-19.83	17.154	-22.21	9.515	16.11	23.078	-6.71	21.528	-14.90	17.918	-16.40	10.82	434	5
7	4.26	19.30	5.35	15.37	7.14	20.28	5.15	13.38	2.06	9.50	14.42	5.54	6.25	17.19	5.39	14.60	2.12	11.14			
	23.171	-5.33	21.806	-11.36	1.075	6.38	20.654	-19.47	17.167	-22.23	9.506	16.16	23.085	-6.67	21.533	-14.87	17.920	-16.40	10.95	575	7
9	4.21	19.34	5.30	15.27	7.10	20.35	5.11	13.39	1.59	9.43	14.33	5.45	6.17	17.12	5.31	14.52	2.04	11.07			
	23.294	-4.55	21.820	-11.79	1.224	7.39	20.758	-19.09	17.179	-22.24	9.497	16.20	23.092	-6.62	21.537	-14.85	17.922	-16.40	11.08	717	9
11	4.16	19.38	5.26	15.20	7.05	20.42	5.07	13.40	1.52	9.36	14.25	5.37	6.10	17.05	5.23	14.45	1.56	10.59			
	23.417	-3.77	21.860	-12.07	1.373	8.39	20.862	-18.71	17.191	-22.25	9.489	16.24	23.100	-6.58	21.542	-14.83	17.924	-16.39	11.21	859	11
13	4.11	19.42	5.23	15.15	7.01	20.48	5.03	13.41	1.45	9.29	14.16	5.29	6.02	16.58	5.16	14.37	1.49	10.51			
	23.540	-2.98	21.921	-12.21	1.523	9.38	20.965	-18.31	17.201	-22.26	9.481	16.28	23.107	-6.54	21.546	-14.81	17.925	-16.39	11.35	002	13
15	4.05	19.47	5.20	15.12	6.56	20.55	4.58	13.42	1.37	9.21	14.08	5.21	5.54	16.51	5.08	14.30	1.41	10.43			
	23.662	-2.19	22.003	-12.21	1.674	10.36	21.068	-17.89	17.211	-22.27	9.473	16.32	23.114	-6.49	21.551	-14.79	17.926	-16.38	11.48	144	15
17	4.00	19.51	5.17	15.11	6.52	21.02	4.54	13.43	1.30	9.14	13.59	5.13	5.47	16.43	5.00	14.23	1.33	10.36			
	23.784	-1.40	22.101	-12.09	1.825	11.32	21.171	-17.47	17.220	-22.28	9.465	16.35	23.121	-6.45	21.555	-14.77	17.928	-16.38	11.61	285	17
19	3.55	19.55	5.15	15.11	6.48	21.08	4.49	13.44	1.23	9.06	13.50	5.05	5.39	16.36	4.52	14.15	1.25	10.28			
	23.906	-0.61	22.213	-11.84	1.976	12.27	21.273	-17.03	17.228	-22.29	9.458	16.39	23.128	-6.40	21.559	-14.75	17.929	-16.38	11.74	427	19
21	3.49	19.59	5.12	15.13	6.44	21.15	4.45	13.45	1.15	8.59	13.42	4.57	5.31	16.29	4.45	14.08	1.17	10.20			
	0.027	0.18	22.339	-11.48	2.129	13.19	21.375	-16.59	17.236	-22.30	9.451	16.42	23.135	-6.36	21.563	-14.73	17.929	-16.37	11.87	568	21
23	3.44	20.04	5.10	15.16	6.39	21.22	4.40	13.46	1.08	8.51	13.34	4.49	5.24	16.22	4.37	14.00	1.09	10.12			
	0.149	0.97	22.474	-11.01	2.282	14.10	21.477	-16.13	17.242	-22.30	9.445	16.45	23.141	-6.32	21.567	-14.71	17.930	-16.37	12.00	710	23
25	3.38	20.08	5.07	15.20	6.35	21.28	4.35	13.47	1.00	8.44	13.25	4.41	5.16	16.14	4.29	13.52	1.02	10.04			
	0.270	1.76	22.620	-10.44	2.436	14.98	21.578	-15.66	17.248	-22.31	9.439	16.48	23.148	-6.28	21.571	-14.69	17.931	-16.36	12.13	852	25
25	4.38	21.08	6.07	16.20	7.35	22.28	5.35	14.47	2.00	9.44	14.25	5.41	6.16	17.14	5.29	14.52	2.02	11.04			
	0.268	1.74	22.616	-10.45	2.432	14.96	21.575	-15.67	17.247	-22.31	9.439	16.48	23.148	-6.28	21.571	-14.69	17.931	-16.36	12.13	852	25
27	4.32	21.13	6.05	16.25	7.31	22.35	5.31	14.48	1.53	9.36	14.17	5.33	6.08	17.07	5.21	14.45	1.54	10.57			
	0.389	2.53	22.769	-9.78	2.587	15.82	21.676	-15.19	17.252	-22.31	9.434	16.50	23.155	-6.23	21.575	-14.67	17.931	-16.36	12.26	995	27
29	4.27	21.17	6.02	16.31	7.28	22.42	5.26	14.49	1.45	9.29	14.08	5.25	6.01	16.60	5.14	14.37	1.46	10.49			
	0.511	3.31	22.930	-9.01	2.743	16.66	21.776	-14.70	17.256	-22.31	9.428	16.52	23.162	-6.19	21.579	-14.66	17.931	-16.35	12.40	137	29
31	4.21	21.22	5.60	16.37	7.24	22.48	5.21	14.50	1.38	9.21	14.00	5.17	5.53	16.53	5.06	14.30	1.38	10.41			
	0.632	4.08	23.096	-8.16	2.900	17.46	21.876	-14.20	17.259	-22.32	9.424	16.55	23.168	-6.15	21.582	-14.64	17.932	-16.35	12.53	278	31

KWIECIEŃ 2007

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)											Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2454																			
91	1	Nie	192	23.51484	-3.59	0.4133	4.28	0.99917	11.4760	0.12	63.515	6.7	98	621	1249.7	1920	1813	*****	555	555	1	
92	2	Pon	193	23.55449	-3.41	0.4512	4.51	0.99945	12.2952	-5.27	63.661	7.7	100	618	1249.4	1922	1925	015.6	602	551	2	
93	3	Wto	194	23.59414	-3.23	0.4851	5.14	0.99974	13.1223	-10.54	63.706	0.7	100	616	1249.1	1923	2038	054.8	611	547	3	
94	4	Śro	195	0.03380	-3.06	0.5230	5.37	1.00003	13.5625	-15.58	63.647	1.7	97	614	1248.8	1925	2153	135.2	620	543	4	
95	5	Czw	196	0.07345	-2.48	0.5609	6.00	1.00032	14.4243	-20.27	63.476	2.7	94	611	1248.5	1927	2309	217.8	632	539	5	
96	6	Pią	197	0.11311	-2.31	0.5948	6.23	1.00061	15.3148	-24.09	63.185	3.7	88	609	1248.3	1929	****	303.2	648	535	6	
97	7	Sob	198	0.15277	-2.14	1.0327	6.46	1.00090	16.2352	-26.50	62.762	4.7	81	606	1248.0	1931	025	351.8	712	532	7	
98	8	Nie	199	0.19242	-1.57	1.0707	7.08	1.00120	17.1836	-28.18	62.204	5.7	73	604	1247.7	1932	137	443.6	747	528	8	
99	9	Pon	200	0.23208	-1.40	1.1047	7.30	1.00149	18.1509	-28.21	61.513	6.7	64	602	1247.4	1934	238	537.8	839	524	9	
100	10	Wto	201	0.27173	-1.24	1.1427	7.53	1.00178	19.1219	-26.55	60.704	7.7	54	559	1247.1	1936	324	633.0	947	520	10	
101	11	Śro	202	0.31139	-1.08	1.1808	8.15	1.00207	20.0854	-24.00	59.807	0.7	43	557	1246.9	1938	356	727.9	1108	516	11	
102	12	Czw	203	0.35104	-0.52	1.2149	8.37	1.00236	21.0409	-19.42	58.870	1.7	32	555	1246.6	1940	418	821.3	1236	512	12	
103	13	Pią	204	0.39070	-0.37	1.2530	8.59	1.00265	21.5753	-14.13	57.954	2.7	22	553	1246.4	1941	435	913.1	1406	508	13	
104	14	Sob	205	0.43036	-0.22	1.2911	9.21	1.00294	22.5033	-7.50	57.137	3.7	13	550	1246.1	1943	447	1003.6	1537	504	14	
105	15	Nie	206	0.47001	-0.07	1.3253	9.42	1.00322	23.4259	-0.51	56.496	4.7	6	548	1245.9	1945	459	1053.8	1709	500	15	
106	16	Pon	207	0.50566	0.07	1.3635	10.03	1.00351	0.3619	6.19	56.101	5.7	2	546	1245.6	1947	510	1144.9	1843	456	16	
107	17	Wto	208	0.54532	0.21	1.4018	10.25	1.00379	1.3138	13.12	55.999	6.7	0	543	1245.4	1949	522	1238.2	2020	452	17	
108	18	Śro	209	0.58497	0.35	1.4401	10.46	1.00406	2.2951	19.17	56.204	0.9	1	541	1245.2	1950	537	1334.8	2159	448	18	
109	19	Czw	210	1.02463	0.48	1.4744	11.07	1.00434	3.3113	24.04	56.695	1.9	6	539	1244.9	1952	557	1434.8	2336	444	19	
110	20	Pią	211	1.06429	1.01	1.5128	11.27	1.00461	4.3458	27.12	57.419	2.9	12	537	1244.7	1954	628	1537.4	****	440	20	
111	21	Sob	212	1.10394	1.13	1.5512	11.48	1.00488	5.3915	28.25	58.303	3.9	21	535	1244.5	1956	715	1640.2	101	436	21	
112	22	Nie	213	1.14360	1.25	1.5857	12.08	1.00515	6.4146	27.48	59.264	4.9	31	532	1244.3	1958	819	1740.6	205	433	22	
113	23	Pon	214	1.18325	1.37	2.0242	12.28	1.00541	7.4037	25.34	60.228	5.9	41	530	1244.1	1959	937	1836.5	248	429	23	
114	24	Wto	215	1.22291	1.48	2.0627	12.48	1.00567	8.3459	22.04	61.129	0.1	51	528	1243.9	2001	1100	1927.3	315	425	24	
115	25	Śro	216	1.26257	1.59	2.1013	13.08	1.00594	9.2459	17.39	61.922	1.1	61	526	1243.8	2003	1220	2013.5	333	421	25	
116	26	Czw	217	1.30222	2.09	2.1359	13.27	1.00620	10.1123	12.36	62.575	2.1	71	524	1243.6	2005	1337	2056.1	346	417	26	
117	27	Pią	218	1.34188	2.19	2.1746	13.47	1.00645	10.5510	7.10	63.075	3.1	79	522	1243.4	2006	1451	2136.3	356	413	27	
118	28	Sob	219	1.38153	2.28	2.2133	14.06	1.00671	11.3725	1.33	63.421	4.1	86	520	1243.3	2008	1603	2215.3	404	409	28	
119	29	Nie	220	1.42119	2.37	2.2521	14.25	1.00697	12.1911	-4.05	63.621	5.1	92	518	1243.1	2010	1714	2254.3	412	405	29	
120	30	Pon	221	1.46084	2.45	2.2909	14.43	1.00722	13.0126	-9.33	63.687	6.1	96	515	1243.0	2012	1826	2334.2	420	401	30	

Fazy Księżyca [Dm, h.mm]: Pełn 2, 19.15 3kw 10, 20.04 Now 17, 13.36 1kw 24, 8.36

MAJ 2007

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2454																					
121	1	Wto	222	1.50050	2.53	2.3258	15.01	1.00748	13.4505	-14.43	63.635	7.1	99	513	1242.9	2013	1940	*****	429	357	1
122	2	Śro	223	1.54015	2.60	2.3648	15.19	1.00773	14.3055	-19.21	63.478	8.1	100	511	1242.7	2015	2056	016.2	441	353	2
123	3	Czw	224	1.57581	3.07	2.4038	15.37	1.00798	15.1931	-23.15	63.225	1.0	99	509	1242.6	2017	2213	100.8	456	349	3
124	4	Pią	225	2.01546	3.13	2.4428	15.55	1.00823	16.1107	-26.11	62.883	2.0	96	508	1242.5	2019	2326	148.7	517	345	4
125	5	Sob	226	2.05512	3.18	2.4819	16.12	1.00848	17.0523	-27.55	62.453	3.0	92	506	1242.4	2020	****	239.7	549	341	5
126	6	Nie	227	2.09478	3.23	2.5211	16.29	1.00873	18.0129	-28.18	61.935	4.0	85	504	1242.4	2022	031	333.3	635	338	6
127	7	Pon	228	2.13443	3.27	2.5603	16.46	1.00898	18.5808	-27.13	61.332	5.0	78	502	1242.3	2024	121	427.9	738	334	7
128	8	Wto	229	2.17409	3.31	2.5956	17.02	1.00922	19.5405	-24.42	60.647	6.0	68	500	1242.2	2026	157	522.2	854	330	8
129	9	Śro	230	2.21374	3.34	3.0349	17.19	1.00947	20.4828	-20.51	59.897	7.0	58	458	1242.2	2027	222	615.0	1018	326	9
130	10	Czw	231	2.25340	3.37	3.0743	17.34	1.00971	21.4104	-15.51	59.107	0.2	47	456	1242.1	2029	240	705.7	1145	322	10
131	11	Pią	232	2.29305	3.39	3.1137	17.50	1.00994	22.3218	-9.56	58.319	1.2	36	455	1242.1	2031	253	754.8	1312	318	11
132	12	Sob	233	2.33271	3.41	3.1532	18.05	1.01018	23.2259	-3.22	57.587	2.2	26	453	1242.1	2032	305	843.2	1440	314	12
133	13	Nie	234	2.37236	3.41	3.1928	18.20	1.01040	0.1416	3.31	56.974	3.2	16	451	1242.1	2034	315	932.0	1609	310	13
134	14	Pon	235	2.41202	3.42	3.2324	18.35	1.01063	1.0722	10.22	56.545	4.2	8	450	1242.1	2036	327	1022.7	1742	306	14
135	15	Wto	236	2.45168	3.41	3.2721	18.49	1.01085	2.0328	16.43	56.353	5.2	3	448	1242.1	2037	340	1116.6	1919	302	15
136	16	Śro	237	2.49133	3.41	3.3119	19.04	1.01107	3.0316	22.04	56.434	6.2	0	446	1242.1	2039	358	1214.6	2058	258	16
137	17	Czw	238	2.53099	3.39	3.3517	19.17	1.01128	4.0636	25.57	56.789	0.6	1	445	1242.1	2040	423	1316.7	2230	254	17
138	18	Pią	239	2.57064	3.37	3.3915	19.31	1.01149	5.1200	27.60	57.392	1.6	4	443	1242.1	2042	502	1421.0	2347	250	18
139	19	Sob	240	3.01030	3.34	3.4314	19.44	1.01169	6.1701	28.05	58.187	2.6	9	442	1242.2	2044	600	1524.5	****	246	19
140	20	Nie	241	3.04596	3.31	3.4714	19.57	1.01189	7.1904	26.22	59.102	3.6	17	440	1242.2	2045	715	1624.3	040	242	20
141	21	Pon	242	3.08561	3.28	3.5114	20.09	1.01208	8.1635	23.11	60.059	4.6	26	439	1242.3	2047	839	1718.9	115	239	21
142	22	Wto	243	3.12527	3.24	3.5515	20.21	1.01227	9.0913	18.55	60.985	5.6	36	438	1242.4	2048	1002	1808.1	137	235	22
143	23	Śro	244	3.16492	3.19	3.5916	20.33	1.01245	9.5734	13.56	61.818	6.6	45	436	1242.4	2050	1123	1852.8	152	231	23
144	24	Czw	245	3.20458	3.14	4.0318	20.44	1.01263	10.4237	8.31	62.512	0.5	55	435	1242.5	2051	1238	1934.4	203	227	24
145	25	Pią	246	3.24423	3.08	4.0720	20.55	1.01281	11.2534	2.55	63.037	1.5	65	434	1242.6	2052	1351	2014.0	212	223	25
146	26	Sob	247	3.28389	3.02	4.1123	21.06	1.01299	12.0733	-2.44	63.383	2.5	73	432	1242.7	2054	1503	2053.0	221	219	26
147	27	Nie	248	3.32355	2.55	4.1526	21.16	1.01316	12.4940	-8.14	63.550	3.5	81	431	1242.8	2055	1614	2132.5	229	215	27
148	28	Pon	249	3.36320	2.48	4.1929	21.26	1.01333	13.3254	-13.27	63.551	4.5	88	430	1242.9	2057	1727	2213.7	238	211	28
149	29	Wto	250	3.40286	2.41	4.2334	21.35	1.01349	14.1811	-18.13	63.408	5.5	94	429	1243.1	2058	1843	2257.5	248	207	29
150	30	Śro	251	3.44251	2.33	4.2738	21.45	1.01365	15.0612	-22.18	63.144	6.5	97	428	1243.2	2059	1959	2344.5	302	203	30
151	31	Czw	252	3.48217	2.25	4.3143	21.53	1.01381	15.5721	-25.29	62.787	7.5	100	427	1243.3	2100	2115	*****	322	159	31

Fazy Księżyca [Dm, h.mm]: Pełn 2, 12.09 3kw 10, 6.27 Nów 16, 21.27 1kw 23, 23.03

CZERWIEC 2007

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2454																			
152	1	Pią	253	3.52182	2.16	4.3548	22.02	1.01397	16.5127	-27.32	62.358	0.4	100	426	1243.5	2101	2223	035.0	350	155	1	
153	2	Sob	254	3.56148	2.07	4.3954	22.10	1.01412	17.4743	-28.13	61.878	1.4	98	425	1243.6	2103	2318	128.4	432	151	2	
154	3	Nie	255	4.00114	1.57	4.4400	22.17	1.01428	18.4448	-27.27	61.361	2.4	94	425	1243.8	2104	2359	223.4	531	147	3	
155	4	Pon	256	4.04079	1.47	4.4807	22.25	1.01442	19.4115	-25.12	60.814	3.4	89	424	1244.0	2105	000	318.3	644	143	4	
156	5	Wto	257	4.08045	1.37	4.5213	22.32	1.01457	20.3559	-21.37	60.246	4.4	81	423	1244.1	2106	026	411.7	807	140	5	
157	6	Śro	258	4.12011	1.26	4.5621	22.38	1.01471	21.2835	-16.52	59.663	5.4	72	422	1244.3	2107	046	502.7	932	136	6	
158	7	Czw	259	4.15576	1.15	5.0028	22.44	1.01485	22.1918	-11.14	59.076	6.4	62	422	1244.5	2108	100	551.6	1058	132	7	
159	8	Pią	260	4.19542	1.04	5.0436	22.50	1.01499	23.0855	-4.57	58.504	7.4	51	421	1244.7	2109	112	638.9	1223	128	8	
160	9	Sob	261	4.23507	0.52	5.0844	22.55	1.01512	23.5830	1.40	57.975	0.9	40	421	1244.9	2110	122	726.0	1349	124	9	
161	10	Nie	262	4.27473	0.41	5.1252	22.60	1.01524	0.4920	8.20	57.526	1.9	29	420	1245.1	2110	133	814.1	1517	120	10	
162	11	Pon	263	4.31438	0.29	5.1701	23.04	1.01536	1.4239	14.40	57.202	2.9	19	420	1245.3	2111	145	904.8	1649	116	11	
163	12	Wto	264	4.35404	0.16	5.2110	23.08	1.01548	2.3931	20.14	57.044	3.9	10	419	1245.5	2112	200	959.3	1824	112	12	
164	13	Śro	265	4.39369	0.04	5.2519	23.12	1.01558	3.4021	24.37	57.088	4.9	4	419	1245.7	2113	221	1058.3	1959	108	13	
165	14	Czw	266	4.43335	-0.09	5.2928	23.15	1.01569	4.4426	27.21	57.349	5.9	1	419	1245.9	2113	253	1201.0	2123	104	14	
166	15	Pią	267	4.47301	-0.22	5.3338	23.18	1.01579	5.4948	28.12	57.823	0.3	0	419	1246.1	2114	341	1305.1	2227	100	15	
167	16	Sob	268	4.51266	-0.35	5.3747	23.21	1.01588	6.5345	27.09	58.480	1.3	2	419	1246.3	2114	449	1407.5	2310	056	16	
168	17	Nie	269	4.55232	-0.48	5.4157	23.23	1.01596	7.5400	24.26	59.268	2.3	7	419	1246.5	2115	611	1505.6	2338	052	17	
169	18	Pon	270	4.59198	-1.01	5.4606	23.24	1.01604	8.4929	20.26	60.125	3.3	13	419	1246.8	2115	738	1558.3	2356	048	18	
170	19	Wto	271	5.03163	-1.14	5.5016	23.25	1.01612	9.4018	15.33	60.982	4.3	21	419	1247.0	2115	901	1645.9	****	045	19	
171	20	Śro	272	5.07129	-1.27	5.5426	23.26	1.01619	10.2715	10.09	61.775	5.3	30	419	1247.2	2116	1021	1729.5	009	041	20	
172	21	Czw	273	5.11094	-1.40	5.5836	23.26	1.01625	11.1128	4.30	62.449	6.3	39	419	1247.4	2116	1136	1810.4	019	037	21	
173	22	Pią	274	5.15060	-1.53	6.0245	23.26	1.01631	11.5408	-1.12	62.963	7.3	49	419	1247.6	2116	1249	1849.9	028	033	22	
174	23	Sob	275	5.19025	-2.06	6.0655	23.26	1.01636	12.3623	-6.48	63.291	0.9	58	419	1247.9	2116	1400	1929.4	036	029	23	
175	24	Nie	276	5.22591	-2.19	6.1104	23.25	1.01641	13.1920	-12.07	63.423	1.9	67	420	1248.1	2116	1513	2010.0	045	025	24	
176	25	Pon	277	5.26556	-2.32	6.1514	23.24	1.01645	14.0358	-17.00	63.365	2.9	76	420	1248.3	2116	1627	2052.7	055	021	25	
177	26	Wto	278	5.30522	-2.45	6.1923	23.22	1.01650	14.5107	-21.17	63.136	3.9	84	420	1248.5	2116	1744	2138.5	107	017	26	
178	27	Śro	279	5.34488	-2.57	6.2332	23.20	1.01653	15.4123	-24.44	62.763	4.9	90	421	1248.7	2116	1900	2227.8	125	013	27	
179	28	Czw	280	5.38453	-3.10	6.2741	23.17	1.01657	16.3453	-27.06	62.284	5.9	95	421	1248.9	2116	2012	2320.6	150	009	28	
180	29	Pią	281	5.42419	-3.22	6.3149	23.14	1.01660	17.3103	-28.10	61.735	6.9	99	422	1249.1	2116	2112	*****	227	005	29	
181	30	Sob	282	5.46385	-3.34	6.3558	23.11	1.01662	18.2839	-27.46	61.155	7.9	100	423	1249.3	2116	2158	015.7	320	001	30	

Fazy Księżyca [Dm, h.mm]: Pełn 1, 3.04 3kw 8, 13.43 Now 15, 5.13 1kw 22, 15.15 Pełn 30, 15.49

CZERWIEC 2007 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT) Dm	
1	*****	*****	5.45	23.04	7.34	0.30	2.36	15.20	21.09	5.02	10.04	1.15	1.53	13.03	1.04	10.31	21.26	6.34		
	4.597	22.03	6.281	25.20	7.879	23.58	0.818	3.61	16.955	-21.95	9.503	16.11	23.315	-5.26	21.633	-14.41	17.872	-16.27	16.60680	1
3	*****	*****	5.49	23.02	7.39	0.27	2.30	15.21	20.60	4.53	9.57	1.07	1.45	12.55	0.56	10.23	21.18	6.26		
	4.733	22.29	6.422	24.87	8.021	23.14	0.910	4.19	16.937	-21.92	9.512	16.07	23.317	-5.24	21.632	-14.41	17.868	-16.27	16.73822	3
5	*****	*****	5.52	22.58	7.43	0.24	2.25	15.21	20.51	4.44	9.50	0.60	1.37	12.47	0.48	10.15	21.10	6.18		
	4.870	22.53	6.544	24.48	8.160	22.67	1.002	4.76	16.918	-21.90	9.522	16.02	23.319	-5.23	21.632	-14.42	17.865	-16.27	16.86964	5
7	*****	*****	5.53	22.52	7.47	0.21	2.19	15.22	20.42	4.35	9.43	0.52	1.30	12.40	0.40	10.07	21.02	6.10		
	5.008	22.74	6.645	24.03	8.297	22.17	1.094	5.34	16.900	-21.88	9.532	15.97	23.321	-5.22	21.631	-14.42	17.861	-16.27	17.00106	7
9	*****	*****	5.54	22.45	7.51	0.17	2.14	15.23	20.33	4.26	9.36	0.45	1.22	12.32	0.32	9.59	20.54	6.02		
	5.146	22.92	6.725	23.54	8.430	21.65	1.186	5.90	16.882	-21.85	9.542	15.92	23.322	-5.22	21.630	-14.43	17.858	-16.27	17.13248	9
11	*****	*****	5.54	22.37	7.55	0.13	2.08	15.23	20.23	4.18	9.29	0.37	1.14	12.24	0.24	9.51	20.46	5.54		
	5.284	23.07	6.783	23.01	8.560	21.10	1.278	6.46	16.864	-21.83	9.553	15.86	23.324	-5.21	21.629	-14.43	17.854	-16.28	17.26390	11
13	*****	*****	5.52	22.27	7.58	0.08	2.03	15.24	20.14	4.09	9.22	0.29	1.06	12.16	0.17	9.43	20.38	5.46		
	5.422	23.20	6.819	22.47	8.687	20.52	1.370	7.02	16.846	-21.80	9.564	15.81	23.325	-5.20	21.627	-14.44	17.851	-16.28	17.39532	13
15	*****	*****	5.49	22.16	8.02	0.04	1.58	15.25	20.05	4.00	9.15	0.22	0.58	12.08	0.09	9.35	20.30	5.38		
	5.560	23.30	6.833	21.92	8.810	19.93	1.461	7.57	16.828	-21.78	9.576	15.75	23.326	-5.20	21.626	-14.45	17.847	-16.28	17.52675	15
17	*****	*****	5.45	22.03	8.06	23.55	1.52	15.25	19.56	3.51	9.09	0.14	0.51	12.01	23.57	9.27	20.22	5.30		
	5.699	23.38	6.825	21.38	8.930	19.32	1.553	8.11	16.811	-21.75	9.587	15.69	23.326	-5.19	21.624	-14.46	17.844	-16.28	17.65817	17
19	*****	*****	5.39	21.50	8.09	23.50	1.47	15.26	19.47	3.43	9.02	0.07	0.43	11.53	23.49	9.19	20.14	5.21		
	5.838	23.42	6.796	20.86	9.046	18.69	1.645	8.65	16.793	-21.73	9.599	15.63	23.327	-5.19	21.623	-14.46	17.840	-16.28	17.78959	19
21	*****	*****	5.32	21.36	8.12	23.44	1.42	15.27	19.38	3.34	8.55	23.55	0.35	11.45	23.41	9.11	20.06	5.13		
	5.977	23.44	6.749	20.36	9.158	18.04	1.737	9.18	16.776	-21.70	9.611	15.57	23.327	-5.19	21.621	-14.47	17.837	-16.29	17.92101	21
23	*****	*****	5.24	21.21	8.15	23.38	1.36	15.27	19.29	3.25	8.48	23.48	0.27	11.37	23.33	9.03	19.57	5.05		
	6.115	23.43	6.685	19.91	9.266	17.38	1.828	9.71	16.760	-21.68	9.624	15.51	23.327	-5.19	21.619	-14.48	17.833	-16.29	18.05243	23
25	*****	*****	5.14	21.06	8.18	23.32	1.31	15.28	19.20	3.17	8.42	23.40	0.19	11.29	23.25	8.55	19.49	4.57		
	6.254	23.39	6.610	19.50	9.370	16.72	1.920	10.22	16.744	-21.66	9.637	15.45	23.327	-5.19	21.617	-14.49	17.829	-16.29	18.18385	25
27	*****	*****	5.04	20.51	8.20	23.26	1.26	15.28	19.11	3.08	8.35	23.33	0.11	11.21	23.17	8.47	19.41	4.49		
	6.392	23.33	6.528	19.16	9.469	16.04	2.012	10.73	16.728	-21.63	9.650	15.38	23.327	-5.20	21.615	-14.51	17.826	-16.30	18.31527	27
29	*****	*****	4.53	20.36	8.22	23.20	1.20	15.29	19.02	2.59	8.28	23.25	0.03	11.13	23.09	8.39	19.33	4.41		
	6.530	23.24	6.443	18.90	9.564	15.36	2.104	11.23	16.713	-21.61	9.663	15.31	23.327	-5.20	21.613	-14.52	17.822	-16.30	18.44670	29

LIPIEC 2007

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2454																					
182	1	Nie	283	5.50350	-3.45	6.4006	23.07	1.01665	19.2610	-25.51	60.578	0.8	99	423	1249.5	2115	2230	111.6	430	2353	1
183	2	Pon	284	5.54316	-3.57	6.4414	23.03	1.01667	20.2212	-22.30	60.029	1.8	96	424	1249.7	2115	2251	206.5	552	2349	2
184	3	Wto	285	5.58281	-4.08	6.4822	22.59	1.01668	21.1600	-17.56	59.525	2.8	91	425	1249.9	2115	2307	259.1	718	2346	3
185	4	Śro	286	6.02247	-4.19	6.5229	22.54	1.01669	22.0735	-12.24	59.076	3.8	84	426	1250.1	2114	2320	349.2	845	2342	4
186	5	Czw	287	6.06213	-4.29	6.5636	22.48	1.01670	22.5731	-6.12	58.686	4.8	75	426	1250.2	2113	2330	437.2	1011	2338	5
187	6	Pią	288	6.10178	-4.40	7.0043	22.42	1.01671	23.4647	0.21	58.356	5.8	65	427	1250.4	2113	2340	524.1	1136	2334	6
188	7	Sob	289	6.14144	-4.50	7.0450	22.36	1.01671	0.3636	6.57	58.090	6.8	53	428	1250.6	2112	2352	611.2	1302	2330	7
189	8	Nie	290	6.18109	-4.59	7.0856	22.30	1.01670	1.2812	13.16	57.898	0.7	42	429	1250.7	2112	****	659.9	1431	2326	8
190	9	Pon	291	6.22075	-5.08	7.1302	22.23	1.01669	2.2241	18.56	57.793	1.7	31	430	1250.9	2111	005	751.6	1603	2322	9
191	10	Wto	292	6.26040	-5.17	7.1707	22.15	1.01668	3.2048	23.33	57.796	2.7	21	431	1251.0	2110	023	847.3	1735	2318	10
192	11	Śro	293	6.30006	-5.26	7.2112	22.08	1.01666	4.2223	26.44	57.923	3.7	12	433	1251.2	2109	049	947.0	1902	2314	11
193	12	Czw	294	6.33572	-5.34	7.2517	21.60	1.01663	5.2610	28.11	58.191	4.7	6	434	1251.3	2108	129	1049.3	2014	2310	12
194	13	Pią	295	6.37537	-5.41	7.2921	21.51	1.01660	6.2955	27.46	58.603	5.7	1	435	1251.4	2107	228	1151.7	2105	2306	13
195	14	Sob	296	6.41503	-5.48	7.3324	21.42	1.01656	7.3113	25.37	59.148	6.7	0	436	1251.6	2106	345	1251.4	2138	2302	14
196	15	Nie	297	6.45468	-5.55	7.3727	21.33	1.01652	8.2829	22.01	59.799	0.9	1	437	1251.7	2105	510	1346.5	2200	2258	15
197	16	Pon	298	6.49434	-6.01	7.4130	21.24	1.01647	9.2116	17.22	60.515	1.9	4	439	1251.8	2104	636	1436.6	2215	2254	16
198	17	Wto	299	6.53400	-6.07	7.4532	21.14	1.01641	10.1000	12.03	61.245	2.9	9	440	1251.9	2103	759	1522.4	2226	2250	17
199	18	Śro	300	6.57365	-6.12	7.4934	21.03	1.01635	10.5537	6.22	61.935	3.9	16	441	1251.9	2102	916	1604.9	2235	2247	18
200	19	Czw	301	7.01331	-6.16	7.5335	20.53	1.01628	11.3912	0.34	62.532	4.9	24	443	1252.0	2101	1031	1645.4	2244	2243	19
201	20	Pią	302	7.05296	-6.20	7.5735	20.42	1.01620	12.2153	-5.08	62.990	5.9	33	444	1252.1	2059	1144	1725.2	2252	2239	20
202	21	Sob	303	7.09262	-6.23	8.0135	20.30	1.01613	13.0445	-10.36	63.275	6.9	42	445	1252.1	2058	1256	1805.4	2301	2235	21
203	22	Nie	304	7.13227	-6.26	8.0534	20.19	1.01604	13.4849	-15.39	63.365	0.1	51	447	1252.2	2057	1410	1847.2	2313	2231	22
204	23	Pon	305	7.17193	-6.28	8.0933	20.07	1.01595	14.3459	-20.08	63.254	1.1	61	448	1252.2	2055	1526	1931.5	2328	2227	23
205	24	Wto	306	7.21158	-6.30	8.1331	19.54	1.01586	15.2400	-23.50	62.951	2.1	70	450	1252.2	2054	1642	2019.1	2349	2223	24
206	25	Śro	307	7.25124	-6.31	8.1729	19.41	1.01576	16.1613	-26.34	62.481	3.1	79	451	1252.3	2052	1756	2110.3	****	2219	25
207	26	Czw	308	7.29090	-6.31	8.2126	19.28	1.01566	17.1125	-28.04	61.880	4.1	86	453	1252.3	2051	1902	2204.5	020	2215	26
208	27	Pią	309	7.33055	-6.31	8.2522	19.15	1.01556	18.0845	-28.09	61.195	5.1	92	454	1252.3	2049	1954	2300.5	107	2211	27
209	28	Sob	310	7.37021	-6.30	8.2918	19.01	1.01545	19.0646	-26.42	60.478	6.1	97	456	1252.2	2048	2030	2356.5	211	2207	28
210	29	Nie	311	7.40587	-6.28	8.3313	18.47	1.01534	20.0401	-23.45	59.782	7.1	100	457	1252.2	2046	2056	*****	330	2203	29
211	30	Pon	312	7.44552	-6.26	8.3707	18.33	1.01523	20.5926	-19.26	59.154	0.4	100	459	1252.2	2044	2114	050.9	457	2159	30
212	31	Wto	313	7.48518	-6.23	8.4101	18.19	1.01511	21.5240	-14.00	58.632	1.4	98	501	1252.1	2043	2127	143.0	626	2155	31

Fazy Księżyca [Dm, h.mm]: Pełn 0, 15.49 3kw 7, 18.54 Nów 14, 14.04 1kw 22, 8.29 Pełn 30, 2.48

LIPIEC 2007 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	*****	*****	4.41	20.22	8.24	23.13	1.15	15.29	18.53	2.51	8.22	23.18	23.52	11.06	23.01	8.31	19.25	4.33		
	6.668	23.12	6.363	18.72	9.653	14.67	2.195	11.73	16.698	-21.59	9.677	15.25	23.326	-5.21	21.611	-14.53	17.819	-16.30	18.57812	1
3	*****	*****	4.30	20.09	8.25	23.06	1.10	15.30	18.44	2.42	8.15	23.11	23.44	10.58	22.53	8.22	19.17	4.25		
	6.806	22.98	6.291	18.63	9.738	13.98	2.287	12.21	16.684	-21.57	9.690	15.18	23.325	-5.21	21.608	-14.54	17.815	-16.31	18.70955	3
5	*****	*****	4.18	19.58	8.26	22.59	1.05	15.30	18.35	2.34	8.09	23.03	23.36	10.50	22.45	8.14	19.09	4.17		
	6.943	22.80	6.233	18.63	9.817	13.30	2.379	12.69	16.671	-21.55	9.704	15.11	23.324	-5.22	21.606	-14.55	17.812	-16.31	18.84097	5
7	*****	*****	4.07	19.48	8.27	22.51	0.60	15.31	18.27	2.25	8.02	22.56	23.28	10.42	22.38	8.06	19.01	4.09		
	7.080	22.60	6.193	18.72	9.891	12.62	2.470	13.15	16.658	-21.53	9.718	15.03	23.323	-5.23	21.603	-14.57	17.808	-16.32	18.97238	7
9	*****	*****	3.57	19.41	8.27	22.44	0.55	15.31	18.18	2.17	7.55	22.48	23.20	10.34	22.30	7.58	18.53	4.00		
	7.217	22.38	6.175	18.90	9.958	11.95	2.562	13.61	16.646	-21.51	9.733	14.96	23.322	-5.24	21.600	-14.58	17.805	-16.32	19.10380	9
11	*****	*****	3.48	19.35	8.27	22.36	0.49	15.31	18.09	2.08	7.49	22.41	23.12	10.26	22.22	7.50	18.45	3.52		
	7.353	22.13	6.179	19.14	10.019	11.28	2.654	14.06	16.634	-21.50	9.747	14.89	23.320	-5.25	21.598	-14.60	17.802	-16.33	19.23523	11
13	*****	*****	3.40	19.31	8.26	22.27	0.44	15.31	18.01	1.60	7.42	22.33	23.04	10.18	22.14	7.42	18.37	3.44		
	7.489	21.85	6.208	19.45	10.074	10.63	2.745	14.50	16.623	-21.48	9.762	14.81	23.318	-5.26	21.595	-14.61	17.799	-16.33	19.36665	13
15	*****	*****	3.33	19.28	8.24	22.19	0.39	15.32	17.52	1.52	7.36	22.26	22.56	10.10	22.06	7.34	18.29	3.36		
	7.624	21.55	6.262	19.80	10.121	10.00	2.837	14.92	16.613	-21.47	9.777	14.74	23.316	-5.28	21.592	-14.63	17.795	-16.34	19.49808	15
17	*****	*****	3.27	19.28	8.22	22.10	0.34	15.32	17.44	1.43	7.29	22.18	22.48	10.01	21.58	7.26	18.21	3.28		
	7.759	21.23	6.342	20.18	10.161	9.39	2.928	15.34	16.604	-21.46	9.792	14.66	23.314	-5.29	21.589	-14.64	17.792	-16.35	19.62950	17
19	*****	*****	3.23	19.29	8.20	22.00	0.30	15.32	17.35	1.35	7.23	22.11	22.41	9.53	21.50	7.17	18.13	3.20		
	7.893	20.88	6.447	20.57	10.193	8.80	3.019	15.75	16.596	-21.45	9.807	14.58	23.312	-5.31	21.586	-14.66	17.789	-16.35	19.76092	19
21	*****	*****	3.20	19.32	8.16	21.51	0.25	15.32	17.27	1.27	7.16	22.04	22.33	9.45	21.42	7.09	18.05	3.12		
	8.026	20.50	6.579	20.94	10.216	8.24	3.111	16.15	16.588	-21.44	9.822	14.50	23.309	-5.33	21.583	-14.67	17.786	-16.36	19.89233	21
23	*****	*****	3.19	19.36	8.12	21.41	0.20	15.32	17.19	1.18	7.10	21.56	22.25	9.37	21.34	7.01	17.57	3.04		
	8.159	20.11	6.735	21.27	10.231	7.72	3.202	16.53	16.581	-21.43	9.838	14.43	23.307	-5.34	21.579	-14.69	17.783	-16.36	20.02375	23
25	*****	*****	3.20	19.41	8.07	21.31	0.15	15.32	17.10	1.10	7.04	21.49	22.17	9.29	21.26	6.53	17.49	2.56		
	8.291	19.69	6.915	21.53	10.236	7.23	3.292	16.91	16.575	-21.43	9.854	14.35	23.304	-5.36	21.576	-14.71	17.781	-16.37	20.15517	25
27	*****	*****	3.23	19.46	8.02	21.20	0.10	15.32	17.02	1.02	6.57	21.41	22.09	9.21	21.18	6.45	17.41	2.48		
	8.423	19.25	7.119	21.71	10.232	6.79	3.383	17.27	16.570	-21.42	9.869	14.26	23.301	-5.38	21.573	-14.72	17.778	-16.38	20.28660	27
29	1.02	0.04	3.28	19.52	7.55	21.09	0.05	15.32	16.54	0.54	6.51	21.34	22.01	9.13	21.10	6.37	17.33	2.40		
	8.554	18.79	7.343	21.77	10.218	6.39	3.474	17.63	16.566	-21.42	9.885	14.18	23.298	-5.40	21.569	-14.74	17.775	-16.39	20.41802	29
31	1.31	-0.04	3.35	19.58	7.48	20.58	23.57	15.32	16.46	0.46	6.44	21.26	21.53	9.05	21.02	6.29	17.25	2.32		
	8.684	18.31	7.587	21.70	10.194	6.05	3.564	17.97	16.563	-21.42	9.901	14.10	23.294	-5.43	21.566	-14.76	17.773	-16.39	20.54944	31

SIERPIEŃ 2007

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2454																					
213	1	Śro	314	7.52483	-6.20	8.4454	18.04	1.01499	22.4402	-7.48	58.239	2.4	93	502	1252.1	2041	2138	232.8	754	2152	1
214	2	Czw	315	7.56449	-6.16	8.4847	17.48	1.01487	23.3421	-1.10	57.982	3.4	86	504	1252.0	2039	2149	321.0	921	2148	2
215	3	Pią	316	8.00414	-6.12	8.5239	17.33	1.01475	0.2440	5.34	57.855	4.4	77	505	1251.9	2037	2200	408.8	1049	2144	3
216	4	Sob	317	8.04380	-6.07	8.5630	17.17	1.01462	1.1609	12.03	57.846	5.4	67	507	1251.9	2036	2212	457.4	1218	2140	4
217	5	Nie	318	8.08345	-6.01	9.0021	17.01	1.01448	2.0955	17.53	57.936	6.4	55	509	1251.8	2034	2228	548.3	1348	2136	5
218	6	Pon	319	8.12311	-5.55	9.0412	16.45	1.01435	3.0642	22.43	58.110	0.5	44	510	1251.7	2032	2251	642.3	1520	2132	6
219	7	Wto	320	8.16276	-5.48	9.0801	16.28	1.01421	4.0636	26.13	58.357	1.5	33	512	1251.5	2030	2325	739.9	1649	2128	7
220	8	Śro	321	8.20242	-5.41	9.1150	16.11	1.01406	5.0845	28.04	58.672	2.5	23	514	1251.4	2028	****	840.2	1805	2124	8
221	9	Czw	322	8.24208	-5.33	9.1539	15.54	1.01391	6.1122	28.09	59.052	3.5	14	515	1251.3	2026	016	941.5	1901	2120	9
222	10	Pią	323	8.28173	-5.24	9.1927	15.37	1.01375	7.1220	26.31	59.499	4.5	7	517	1251.1	2024	126	1041.0	1939	2116	10
223	11	Sob	324	8.32139	-5.15	9.2314	15.19	1.01359	8.0960	23.22	60.007	5.5	3	519	1251.0	2022	248	1137.0	2004	2112	11
224	12	Nie	325	8.36104	-5.05	9.2701	15.01	1.01343	9.0337	19.03	60.567	6.5	0	520	1250.8	2020	413	1228.5	2021	2108	12
225	13	Pon	326	8.40070	-4.55	9.3048	14.43	1.01326	9.5321	13.55	61.158	0.5	0	522	1250.7	2018	537	1315.6	2033	2104	13
226	14	Wto	327	8.44036	-4.44	9.3433	14.25	1.01308	10.3953	8.19	61.751	1.5	2	524	1250.5	2016	656	1359.3	2043	2100	14
227	15	Śro	328	8.48001	-4.33	9.3819	14.06	1.01290	11.2411	2.30	62.310	2.5	6	525	1250.3	2014	812	1440.6	2052	2056	15
228	16	Czw	329	8.51567	-4.21	9.4203	13.48	1.01271	12.0718	-3.19	62.796	3.5	12	527	1250.1	2012	926	1520.8	2100	2053	16
229	17	Pią	330	8.55532	-4.09	9.4548	13.29	1.01252	12.5013	-8.55	63.167	4.5	18	529	1249.9	2010	1039	1600.9	2109	2049	17
230	18	Sob	331	8.59498	-3.56	9.4931	13.09	1.01233	13.3354	-14.08	63.388	5.5	26	531	1249.7	2008	1153	1642.1	2119	2045	18
231	19	Nie	332	9.03463	-3.42	9.5314	12.50	1.01213	14.1916	-18.49	63.431	6.5	35	532	1249.5	2005	1308	1725.2	2132	2041	19
232	20	Pon	333	9.07429	-3.28	9.5657	12.30	1.01192	15.0703	-22.47	63.279	7.5	44	534	1249.2	2003	1423	1811.1	2151	2037	20
233	21	Wto	334	9.11394	-3.14	10.0039	12.10	1.01171	15.5742	-25.51	62.930	0.4	54	536	1249.0	2001	1538	1900.3	2217	2033	21
234	22	Śro	335	9.15360	-2.59	10.0421	11.50	1.01150	16.5118	-27.46	62.395	1.4	64	537	1248.7	1959	1647	1952.6	2256	2029	22
235	23	Czw	336	9.19325	-2.44	10.0802	11.30	1.01129	17.4718	-28.22	61.705	2.4	73	539	1248.5	1957	1745	2047.3	2351	2025	23
236	24	Pią	337	9.23291	-2.28	10.1142	11.10	1.01107	18.4438	-27.30	60.903	3.4	81	541	1248.2	1954	1828	2142.9	****	2021	24
237	25	Sob	338	9.27257	-2.11	10.1523	10.49	1.01085	19.4158	-25.07	60.047	4.4	89	543	1247.9	1952	1857	2237.9	104	2017	25
238	26	Nie	339	9.31222	-1.55	10.1903	10.28	1.01063	20.3810	-21.17	59.202	5.4	95	544	1247.7	1950	1918	2331.3	228	2013	26
239	27	Pon	340	9.35188	-1.38	10.2242	10.08	1.01041	21.3239	-16.11	58.435	6.4	99	546	1247.4	1948	1934	****	357	2009	27
240	28	Wto	341	9.39153	-1.20	10.2621	9.47	1.01019	22.2527	-10.08	57.807	7.4	100	548	1247.1	1945	1946	022.8	527	2005	28
241	29	Śro	342	9.43119	-1.02	10.2960	9.25	1.00996	23.1710	-3.26	57.365	1.0	99	549	1246.8	1943	1957	112.6	657	2001	29
242	30	Czw	343	9.47084	-0.44	10.3338	9.04	1.00973	0.0844	3.30	57.133	2.0	95	551	1246.5	1941	2008	201.8	827	1957	30
243	31	Pią	344	9.51050	-0.25	10.3716	8.42	1.00950	1.0112	10.17	57.113	3.0	88	553	1246.2	1938	2020	251.5	958	1954	31

Fazy Księżyca [Dm, h.mm]: 3kw 5, 23.20 Now 13, 1.02 1kw 21, 1.54 Pełn 28, 12.35

WRZESIEŃ 2007

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)											Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2454																			
244	1	Sob	345	9.55015	-0.07	10.4054	8.21	1.00927	1.5538	16.30	57.285	4.0	79	555	1245.9	1936	2035	343.0	1131	1950	1	
245	2	Nie	346	9.58581	0.13	10.4431	7.59	1.00904	2.5246	21.43	57.613	5.0	69	556	1245.5	1934	2055	437.2	1305	1946	2	
246	3	Pon	347	10.02546	0.32	10.4808	7.37	1.00880	3.5241	25.36	58.055	6.0	58	558	1245.2	1931	2126	534.6	1436	1942	3	
247	4	Wto	348	10.06512	0.52	10.5145	7.15	1.00857	4.5440	27.51	58.570	0.3	46	600	1244.9	1929	2211	634.6	1557	1938	4	
248	5	Śro	349	10.10477	1.12	10.5522	6.53	1.00833	5.5703	28.20	59.124	1.3	35	601	1244.6	1927	2315	735.6	1659	1934	5	
249	6	Czw	350	10.14443	1.32	10.5858	6.31	1.00808	6.5752	27.05	59.693	2.3	25	603	1244.2	1924	****	835.3	1742	1930	6	
250	7	Pią	351	10.18409	1.52	11.0235	6.08	1.00784	7.5533	24.19	60.260	3.3	17	605	1243.9	1922	033	931.6	1810	1926	7	
251	8	Sob	352	10.22374	2.12	11.0611	5.46	1.00759	8.4921	20.20	60.818	4.3	10	607	1243.5	1919	156	1023.6	1828	1922	8	
252	9	Nie	353	10.26340	2.33	11.0947	5.23	1.00734	9.3922	15.29	61.360	5.3	4	608	1243.2	1917	319	1111.3	1842	1918	9	
253	10	Pon	354	10.30305	2.54	11.1322	5.00	1.00708	10.2612	10.02	61.879	6.3	1	610	1242.8	1915	439	1155.6	1852	1914	10	
254	11	Wto	355	10.34271	3.15	11.1658	4.38	1.00682	11.1045	4.18	62.365	7.3	0	612	1242.5	1912	556	1237.4	1901	1910	11	
255	12	Śro	356	10.38236	3.36	11.2033	4.15	1.00656	11.5359	-1.31	62.802	0.9	1	613	1242.1	1910	710	1317.7	1909	1906	12	
256	13	Czw	357	10.42202	3.57	11.2409	3.52	1.00630	12.3652	-7.12	63.168	1.9	3	615	1241.8	1907	823	1357.8	1918	1902	13	
257	14	Pią	358	10.46167	4.18	11.2744	3.29	1.00603	13.2017	-12.34	63.437	2.9	8	617	1241.4	1905	937	1438.5	1927	1859	14	
258	15	Sob	359	10.50133	4.40	11.3119	3.06	1.00575	14.0505	-17.26	63.581	3.9	13	618	1241.1	1903	1051	1520.7	1939	1855	15	
259	16	Nie	360	10.54098	5.01	11.3455	2.43	1.00548	14.5158	-21.38	63.575	4.9	20	620	1240.7	1900	1206	1605.4	1955	1851	16	
260	17	Pon	361	10.58064	5.22	11.3830	2.20	1.00520	15.4123	-24.58	63.396	5.9	29	622	1240.4	1858	1321	1652.9	2018	1847	17	
261	18	Wto	362	11.02029	5.44	11.4205	1.56	1.00492	16.3327	-27.15	63.032	6.9	38	624	1240.0	1855	1432	1743.3	2050	1843	18	
262	19	Śro	363	11.05595	6.05	11.4540	1.33	1.00464	17.2749	-28.18	62.483	7.9	47	625	1239.7	1853	1534	1836.0	2138	1839	19	
263	20	Czw	364	11.09561	6.26	11.4915	1.10	1.00436	18.2340	-27.58	61.766	0.7	57	627	1239.3	1850	1622	1930.1	2242	1835	20	
264	21	Pią	365	11.13526	6.48	11.5251	0.47	1.00408	19.1954	-26.11	60.911	1.7	67	629	1239.0	1848	1657	2024.3	****	1831	21	
265	22	Sob	366	11.17492	7.09	11.5626	0.23	1.00379	20.1530	-22.58	59.969	2.7	76	631	1238.6	1846	1721	2117.4	000	1827	22	
266	23	Nie	367	11.21457	7.30	12.0001	0.00	1.00351	21.0951	-18.27	59.004	3.7	85	632	1238.2	1843	1738	2209.0	125	1823	23	
267	24	Pon	368	11.25423	7.51	12.0337	-0.23	1.00322	22.0252	-12.49	58.093	4.7	92	634	1237.9	1841	1752	2259.3	254	1819	24	
268	25	Wto	369	11.29388	8.12	12.0712	-0.47	1.00294	22.5501	-6.22	57.314	5.7	97	636	1237.5	1838	1803	2349.1	423	1815	25	
269	26	Śro	370	11.33354	8.33	12.1048	-1.10	1.00265	23.4707	0.35	56.737	6.7	100	637	1237.2	1836	1814	*****	554	1811	26	
270	27	Czw	371	11.37319	8.54	12.1424	-1.34	1.00237	0.4014	7.37	56.414	0.6	99	639	1236.9	1834	1826	039.3	726	1807	27	
271	28	Pią	372	11.41285	9.14	12.1800	-1.57	1.00209	1.3523	14.16	56.367	1.6	96	641	1236.5	1831	1840	131.3	901	1803	28	
272	29	Sob	373	11.45250	9.34	12.2136	-2.20	1.00180	2.3325	20.03	56.589	2.6	90	643	1236.2	1829	1859	226.1	1038	1800	29	
273	30	Nie	374	11.49216	9.54	12.2513	-2.44	1.00152	3.3429	24.32	57.042	3.6	82	644	1235.8	1826	1926	324.4	1214	1756	30	

Fazy Księżyca [Dm, h.mm]: 3kw 4, 4.32 Now 11, 14.44 1kw 19, 18.48 Pełn 26, 21.45

WRZESIEŃ 2007 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST (0^h UT) Dm	
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach		
1	3.43	21.48	7.22	20.02	4.30	18.03	22.47	15.17	14.46	22.38	5.02	19.28	19.45	6.52	18.55	4.18	15.19	0.23		
	10.682	8.35	11.612	3.31	9.177	8.07	4.960	21.93	16.626	-21.66	10.161	12.73	23.226	-5.87	21.510	-15.04	17.749	-16.54	22.65215	1
3	3.48	21.41	7.34	19.58	4.18	17.55	22.43	15.15	14.38	22.31	4.56	19.21	19.37	6.44	18.47	4.10	15.11	0.15		
	10.802	7.62	11.808	1.79	9.150	8.42	5.042	22.08	16.637	-21.68	10.178	12.65	23.221	-5.90	21.507	-15.05	17.748	-16.55	22.78357	3
5	3.53	21.35	7.45	19.54	4.08	17.48	22.39	15.13	14.32	22.24	4.49	19.13	19.29	6.36	18.39	4.01	15.03	0.07		
	10.923	6.88	11.999	0.28	9.133	8.75	5.124	22.23	16.649	-21.71	10.194	12.56	23.216	-5.93	21.503	-15.07	17.748	-16.56	22.91499	5
7	3.58	21.29	7.56	19.49	3.58	17.41	22.35	15.11	14.25	22.16	4.43	19.06	19.21	6.27	18.31	3.53	14.55	23.56		
	11.043	6.14	12.184	-1.20	9.127	9.06	5.204	22.37	16.661	-21.74	10.210	12.47	23.212	-5.96	21.500	-15.08	17.748	-16.57	23.04641	7
9	4.03	21.22	8.07	19.44	3.49	17.35	22.30	15.09	14.18	22.09	4.37	18.58	19.13	6.19	18.23	3.45	14.48	23.48		
	11.163	5.38	12.365	-2.65	9.131	9.34	5.284	22.49	16.674	-21.78	10.226	12.39	23.207	-5.99	21.497	-15.10	17.748	-16.58	23.17783	9
11	4.08	21.16	8.17	19.39	3.40	17.30	22.26	15.07	14.11	22.02	4.30	18.51	19.05	6.11	18.15	3.37	14.40	23.40		
	11.283	4.63	12.541	-4.07	9.146	9.59	5.362	22.61	16.689	-21.81	10.242	12.30	23.202	-6.02	21.494	-15.11	17.748	-16.59	23.30925	11
13	4.12	21.10	8.27	19.34	3.33	17.25	22.22	15.05	14.04	21.54	4.24	18.44	18.57	6.02	18.07	3.29	14.32	23.32		
	11.402	3.86	12.713	-5.45	9.170	9.80	5.440	22.72	16.703	-21.84	10.258	12.22	23.197	-6.05	21.491	-15.13	17.749	-16.60	23.44066	13
15	4.17	21.04	8.36	19.29	3.26	17.20	22.18	15.02	13.58	21.47	4.17	18.36	18.49	5.54	17.59	3.21	14.24	23.24		
	11.522	3.10	12.880	-6.79	9.204	9.98	5.516	22.82	16.719	-21.88	10.273	12.14	23.192	-6.08	21.488	-15.14	17.749	-16.62	23.57208	15
17	4.21	20.59	8.45	19.24	3.20	17.15	22.14	14.59	13.51	21.40	4.11	18.29	18.41	5.46	17.51	3.13	14.16	23.16		
	11.642	2.33	13.042	-8.09	9.246	10.13	5.591	22.91	16.735	-21.91	10.289	12.05	23.187	-6.11	21.485	-15.16	17.750	-16.63	23.70350	17
19	4.26	20.53	8.54	19.19	3.14	17.11	22.10	14.57	13.44	21.33	4.04	18.21	18.33	5.37	17.43	3.04	14.09	23.08		
	11.761	1.55	13.201	-9.35	9.297	10.24	5.665	23.00	16.752	-21.95	10.304	11.97	23.182	-6.14	21.483	-15.17	17.750	-16.64	23.83492	19
21	4.30	20.47	9.02	19.13	3.09	17.07	22.06	14.54	13.38	21.26	3.58	18.14	18.25	5.29	17.35	2.56	14.01	23.00		
	11.881	0.78	13.354	-10.55	9.355	10.30	5.738	23.08	16.769	-21.98	10.319	11.89	23.177	-6.17	21.480	-15.18	17.751	-16.65	23.96634	21
23	4.34	20.42	9.09	19.08	3.05	17.03	22.02	14.51	13.31	21.19	3.51	18.06	18.18	5.21	17.27	2.48	13.53	22.52		
	12.000	0.00	13.502	-11.69	9.421	10.33	5.809	23.15	16.788	-22.02	10.335	11.81	23.172	-6.20	21.478	-15.19	17.752	-16.66	0.09776	23
25	4.38	20.36	9.16	19.02	3.02	16.60	21.58	14.47	13.25	21.12	3.45	17.59	18.10	5.12	17.19	2.40	13.46	22.45		
	12.120	-0.78	13.643	-12.77	9.493	10.32	5.879	23.21	16.807	-22.06	10.350	11.73	23.168	-6.23	21.475	-15.21	17.754	-16.67	0.22918	25
27	4.42	20.31	9.22	18.56	2.59	16.56	21.53	14.44	13.18	21.05	3.38	17.52	18.02	5.04	17.11	2.32	13.38	22.37		
	12.240	-1.56	13.778	-13.77	9.571	10.27	5.947	23.27	16.826	-22.10	10.364	11.65	23.163	-6.26	21.473	-15.22	17.755	-16.68	0.36060	27
29	4.46	20.26	9.27	18.51	2.57	16.53	21.49	14.41	13.12	20.58	3.32	17.44	17.54	4.56	17.03	2.24	13.30	22.29		
	12.360	-2.34	13.904	-14.69	9.655	10.18	6.014	23.33	16.846	-22.14	10.379	11.57	23.158	-6.29	21.470	-15.23	17.757	-16.69	0.49201	29

PAŹDZIERNIK 2007

Piwnice, CA UMK			← Dane na godz. 12 czasu strefowego (= 10 lub 11 ^b UT) →									 Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2454																					
274	1	Pon	375	11.53181	10.14	12.2850	-3.07	1.00124	4.3749	27.20	57.668	4.6	72	646	1235.5	1824	2007	425.7	1342	1752	1
275	2	Wto	376	11.57147	10.33	12.3227	-3.30	1.00096	5.4141	28.18	58.404	5.6	61	648	1235.2	1822	2106	528.3	1453	1748	2
276	3	Śro	377	12.01112	10.52	12.3605	-3.53	1.00068	6.4354	27.26	59.187	6.6	50	650	1234.9	1819	2221	629.6	1542	1744	3
277	4	Czw	378	12.05078	11.11	12.3943	-4.16	1.00040	7.4242	24.59	59.965	1.0	39	651	1234.6	1817	2344	727.6	1614	1740	4
278	5	Pią	379	12.09044	11.29	12.4321	-4.40	1.00012	8.3718	21.16	60.702	2.0	29	653	1234.3	1814	****	820.8	1636	1736	5
279	6	Sob	380	12.13009	11.47	12.4659	-5.03	0.99983	9.2746	16.38	61.374	3.0	20	655	1234.0	1812	107	909.5	1650	1732	6
280	7	Nie	381	12.16575	12.05	12.5038	-5.26	0.99955	10.1450	11.23	61.967	4.0	13	657	1233.7	1810	227	954.3	1701	1728	7
281	8	Pon	382	12.20540	12.22	12.5418	-5.49	0.99927	10.5925	5.46	62.478	5.0	7	658	1233.4	1807	344	1036.2	1711	1724	8
282	9	Wto	383	12.24506	12.39	12.5758	-6.12	0.99898	11.4233	0.01	62.907	6.0	3	700	1233.1	1805	458	1116.6	1719	1720	9
283	10	Śro	384	12.28471	12.55	13.0138	-6.34	0.99870	12.2513	-5.39	63.251	7.0	1	702	1232.8	1803	611	1156.3	1727	1716	10
284	11	Czw	385	12.32437	13.11	13.0519	-6.57	0.99841	13.0819	-11.05	63.510	0.2	0	704	1232.6	1800	723	1236.6	1737	1712	11
285	12	Pią	386	12.36402	13.26	13.0900	-7.20	0.99812	13.5240	-16.05	63.674	1.2	1	706	1232.3	1758	837	1318.3	1748	1708	12
286	13	Sob	387	12.40368	13.41	13.1242	-7.42	0.99783	14.3858	-20.28	63.732	2.2	4	707	1232.1	1756	952	1402.1	1802	1704	13
287	14	Nie	388	12.44333	13.55	13.1624	-8.05	0.99755	15.2738	-24.02	63.667	3.2	9	709	1231.8	1753	1107	1448.5	1822	1701	14
288	15	Pon	389	12.48299	14.09	13.2007	-8.27	0.99726	16.1847	-26.36	63.464	4.2	15	711	1231.6	1751	1219	1537.7	1851	1657	15
289	16	Wto	390	12.52264	14.22	13.2350	-8.49	0.99697	17.1204	-27.59	63.108	5.2	23	713	1231.4	1749	1324	1629.1	1933	1653	16
290	17	Śro	391	12.56230	14.34	13.2734	-9.11	0.99668	18.0643	-28.03	62.591	6.2	31	715	1231.2	1747	1417	1721.8	2029	1649	17
291	18	Czw	392	13.00196	14.47	13.3119	-9.33	0.99639	19.0143	-26.45	61.916	7.2	41	717	1231.0	1744	1455	1814.6	2140	1645	18
292	19	Pią	393	13.04161	14.58	13.3504	-9.55	0.99610	19.5606	-24.05	61.097	0.1	51	718	1230.8	1742	1522	1906.6	2300	1641	19
293	20	Sob	394	13.08127	15.09	13.3850	-10.16	0.99581	20.4919	-20.09	60.169	1.1	61	720	1230.6	1740	1542	1957.2	****	1637	20
294	21	Nie	395	13.12092	15.19	13.4236	-10.38	0.99553	21.4115	-15.06	59.182	2.1	71	722	1230.4	1738	1556	2046.4	025	1633	21
295	22	Pon	396	13.16058	15.29	13.4623	-10.59	0.99524	22.3220	-9.08	58.203	3.1	81	724	1230.3	1736	1609	2135.0	151	1629	22
296	23	Wto	397	13.20023	15.38	13.5010	-11.20	0.99496	23.2323	-2.31	57.312	4.1	89	726	1230.1	1734	1620	2224.1	319	1625	23
297	24	Śro	398	13.23589	15.46	13.5359	-11.41	0.99468	0.1528	4.25	56.592	5.1	95	728	1230.0	1731	1631	2314.8	448	1621	24
298	25	Czw	399	13.27554	15.54	13.5748	-12.02	0.99441	1.0946	11.17	56.116	6.1	99	730	1229.9	1729	1644	*****	621	1617	25
299	26	Pią	400	13.31520	16.00	14.0137	-12.23	0.99413	2.0718	17.34	55.935	0.2	100	731	1229.7	1727	1701	008.5	758	1613	26
300	27	Sob	401	13.35485	16.07	14.0528	-12.43	0.99386	3.0837	22.44	56.066	1.2	98	733	1229.6	1725	1725	106.4	938	1609	27
301	28	Nie	402	13.39451	16.12	14.0919	-13.03	0.99360	4.1314	26.20	56.491	2.2	93	735	1229.5	1723	1800	208.3	1114	1606	28
301	28	Nie	402	14.39550	16.12	14.0929	-13.04	0.99359	4.1559	26.26	56.515	3.2	92	635	1129.5	1623	1700	108.3	1014	1506	28
302	29	Pon	403	14.43515	16.17	14.1320	-13.24	0.99332	5.2211	28.02	57.191	4.2	85	637	1129.5	1621	1754	213.0	1136	1502	29
303	30	Wto	404	14.47481	16.21	14.1713	-13.44	0.99306	6.2713	27.39	58.034	5.2	75	639	1129.4	1619	1906	317.6	1236	1458	30
304	31	Śro	405	14.51446	16.24	14.2107	-14.04	0.99280	7.2845	25.30	58.965	6.2	65	641	1129.4	1617	2029	419.1	1315	1454	31

Fazy Księżyca [Dm, h.mm]: 3kw 3, 12.06 Now 11, 7.01 1kw 19, 10.33 Pełn 26, 6.52

PAŹDZIERNIK 2007 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.50	20.20	9.31	18.45	2.55	16.50	21.45	14.37	13.06	20.51	3.25	17.37	17.46	4.48	16.55	2.16	13.22	22.21		
	12.481	-3.11	14.021	-15.52	9.745	10.05	6.079	23.38	16.867	-22.18	10.394	11.49	23.154	-6.32	21.468	-15.24	17.758	-16.70	0.62343	1
3	4.54	20.15	9.34	18.39	2.53	16.46	21.40	14.33	12.59	20.44	3.19	17.29	17.38	4.39	16.47	2.08	13.15	22.13		
	12.601	-3.89	14.125	-16.25	9.838	9.88	6.142	23.42	16.888	-22.21	10.408	11.41	23.150	-6.34	21.466	-15.25	17.760	-16.71	0.75485	3
5	4.58	20.10	9.36	18.32	2.53	16.43	21.36	14.30	12.53	20.37	3.12	17.22	17.30	4.31	16.40	1.60	13.07	22.05		
	12.722	-4.66	14.215	-16.86	9.937	9.68	6.204	23.47	16.910	-22.25	10.422	11.34	23.145	-6.37	21.465	-15.26	17.762	-16.73	0.88628	5
7	5.02	20.05	9.35	18.26	2.52	16.40	21.31	14.26	12.47	20.31	3.06	17.14	17.22	4.23	16.32	1.52	12.59	21.58		
	12.844	-5.43	14.288	-17.33	10.039	9.43	6.264	23.50	16.932	-22.29	10.436	11.26	23.141	-6.40	21.463	-15.27	17.764	-16.74	1.01770	7
9	5.05	20.01	9.32	18.19	2.52	16.37	21.26	14.22	12.41	20.24	2.59	17.07	17.14	4.14	16.24	1.44	12.52	21.50		
	12.966	-6.19	14.340	-17.64	10.144	9.15	6.322	23.54	16.955	-22.33	10.449	11.19	23.137	-6.42	21.461	-15.27	17.766	-16.75	1.14911	9
11	5.09	19.56	9.27	18.12	2.53	16.34	21.22	14.17	12.35	20.17	2.52	16.59	17.06	4.06	16.16	1.36	12.44	21.42		
	13.089	-6.95	14.367	-17.75	10.253	8.83	6.378	23.57	16.979	-22.37	10.463	11.12	23.133	-6.45	21.460	-15.28	17.769	-16.76	1.28053	11
13	5.13	19.51	9.18	18.05	2.54	16.31	21.17	14.13	12.28	20.10	2.46	16.52	16.58	3.58	16.08	1.28	12.36	21.34		
	13.212	-7.70	14.365	-17.64	10.365	8.47	6.431	23.61	17.003	-22.41	10.476	11.05	23.129	-6.47	21.458	-15.29	17.771	-16.77	1.41194	13
15	5.16	19.47	9.06	17.57	2.55	16.28	21.12	14.08	12.22	20.04	2.39	16.44	16.50	3.50	15.60	1.20	12.29	21.26		
	13.335	-8.45	14.330	-17.27	10.480	8.09	6.482	23.64	17.027	-22.45	10.489	10.98	23.125	-6.49	21.457	-15.29	17.774	-16.78	1.54336	15
17	5.20	19.42	8.50	17.49	2.56	16.24	21.07	14.04	12.16	19.57	2.32	16.37	16.42	3.42	15.52	1.12	12.21	21.19		
	13.460	-9.18	14.261	-16.61	10.597	7.66	6.531	23.67	17.052	-22.49	10.502	10.91	23.122	-6.51	21.456	-15.30	17.777	-16.79	1.67479	17
19	5.23	19.38	8.30	17.41	2.58	16.21	21.01	13.59	12.10	19.50	2.26	16.29	16.34	3.33	15.44	1.04	12.14	21.11		
	13.584	-9.91	14.160	-15.65	10.716	7.21	6.578	23.70	17.078	-22.53	10.514	10.85	23.118	-6.54	21.455	-15.30	17.779	-16.80	1.80621	19
21	5.27	19.34	8.07	17.33	3.00	16.18	20.56	13.54	12.04	19.44	2.19	16.22	16.26	3.25	15.36	0.56	12.06	21.03		
	13.710	-10.63	14.031	-14.42	10.837	6.72	6.622	23.73	17.104	-22.57	10.526	10.78	23.115	-6.55	21.454	-15.31	17.782	-16.81	1.93763	21
23	5.30	19.30	7.42	17.25	3.02	16.15	20.50	13.49	11.58	19.37	2.12	16.14	16.18	3.17	15.28	0.48	11.58	20.55		
	13.836	-11.34	13.889	-12.97	10.960	6.21	6.664	23.77	17.130	-22.61	10.538	10.72	23.112	-6.57	21.453	-15.31	17.786	-16.82	2.06904	23
25	5.34	19.26	7.17	17.18	3.05	16.11	20.44	13.43	11.52	19.31	2.05	16.07	16.10	3.09	15.21	0.40	11.51	20.48		
	13.963	-12.03	13.747	-11.46	11.085	5.67	6.702	23.81	17.157	-22.64	10.550	10.66	23.109	-6.59	21.453	-15.31	17.789	-16.83	2.20046	25
27	5.37	19.22	6.53	17.11	3.08	16.08	20.38	13.38	11.46	19.24	1.58	15.59	16.02	3.01	15.13	0.32	11.43	20.40		
	14.091	-12.72	13.624	-10.03	11.212	5.09	6.738	23.85	17.184	-22.68	10.561	10.60	23.106	-6.61	21.453	-15.32	17.792	-16.84	2.33188	27
29	4.41	18.18	5.33	16.04	2.11	15.04	19.32	12.33	10.40	18.18	0.51	14.52	14.54	1.53	14.05	23.21	10.35	19.32		
	14.222	-13.40	13.532	-8.81	11.342	4.48	6.772	23.89	17.213	-22.72	10.572	10.54	23.103	-6.62	21.452	-15.32	17.796	-16.85	2.46330	29
31	4.44	18.15	5.18	15.58	2.14	15.01	19.25	12.27	10.34	18.11	0.45	14.44	14.46	1.45	13.57	23.13	10.28	19.25		
	14.352	-14.06	13.485	-7.97	11.472	3.86	6.801	23.94	17.241	-22.75	10.583	10.49	23.100	-6.64	21.452	-15.32	17.799	-16.86	2.59472	31

LISTOPAD 2007

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2454																					
305	1	Czw	406	14.55412	16.26	14.2501	-14.23	0.99255	8.2534	21.58	59.908	7.2	55	643	1129.3	1615	2154	515.6	1340	1450	1
306	2	Pią	407	14.59378	16.27	14.2856	-14.42	0.99230	9.1735	17.27	60.802	0.6	44	645	1129.3	1613	2316	606.6	1357	1446	2
307	3	Sob	408	15.03343	16.28	14.3252	-15.01	0.99205	10.0536	12.16	61.603	1.6	34	646	1129.3	1611	****	653.0	1410	1442	3
308	4	Nie	409	15.07309	16.28	14.3649	-15.20	0.99180	10.5038	6.44	62.284	2.6	25	648	1129.3	1609	034	735.8	1419	1438	4
309	5	Pon	410	15.11274	16.27	14.4047	-15.38	0.99155	11.3352	1.03	62.832	3.6	17	650	1129.3	1608	148	816.4	1428	1434	5
310	6	Wto	411	15.15240	16.25	14.4445	-15.56	0.99131	12.1623	-4.36	63.246	4.6	11	652	1129.3	1606	301	856.1	1437	1430	6
311	7	Śro	412	15.19205	16.22	14.4844	-16.14	0.99106	12.5910	-10.02	63.533	5.6	6	654	1129.4	1604	413	935.9	1446	1426	7
312	8	Czw	413	15.23171	16.18	14.5245	-16.32	0.99082	13.4308	-15.05	63.701	6.6	2	656	1129.4	1602	525	1017.0	1457	1422	8
313	9	Pią	414	15.27136	16.14	14.5646	-16.49	0.99058	14.2901	-19.34	63.759	7.6	0	658	1129.5	1601	640	1000.0	1510	1418	9
314	10	Sob	415	15.31102	16.08	15.0048	-17.06	0.99034	15.1717	-23.17	63.715	0.5	0	700	1129.6	1559	755	1145.6	1528	1414	10
315	11	Nie	416	15.35067	16.02	15.0450	-17.23	0.99011	16.0805	-26.03	63.569	1.5	2	702	1129.7	1557	908	1234.1	1555	1410	11
316	12	Pon	417	15.39033	15.55	15.0854	-17.39	0.98987	17.0103	-27.39	63.319	2.5	6	703	1129.8	1556	1016	1325.0	1632	1407	12
317	13	Wto	418	15.42599	15.47	15.1258	-17.55	0.98964	17.5523	-27.57	62.958	3.5	11	705	1130.0	1554	1112	1417.3	1724	1403	13
318	14	Śro	419	15.46564	15.39	15.1704	-18.11	0.98941	18.4959	-26.55	62.481	4.5	18	707	1130.1	1553	1154	1509.7	1830	1359	14
319	15	Czw	420	15.50530	15.29	15.2110	-18.27	0.98918	19.4346	-24.34	61.883	5.5	26	709	1130.3	1551	1224	1601.1	1946	1355	15
320	16	Pią	421	15.54496	15.19	15.2517	-18.42	0.98895	20.3606	-20.59	61.169	6.5	35	711	1130.4	1550	1246	1650.9	2107	1351	16
321	17	Sob	422	15.58461	15.08	15.2924	-18.57	0.98873	21.2652	-16.20	60.354	7.5	45	713	1130.6	1548	1302	1739.0	2230	1347	17
322	18	Nie	423	16.02427	14.56	15.3333	-19.11	0.98851	22.1626	-10.49	59.469	0.5	56	714	1130.8	1547	1314	1825.9	2353	1343	18
323	19	Pon	424	16.06392	14.43	15.3742	-19.26	0.98829	23.0536	-4.38	58.560	1.5	66	716	1131.0	1545	1325	1912.7	****	1339	19
324	20	Wto	425	16.10358	14.29	15.4152	-19.39	0.98808	23.5529	1.59	57.689	2.5	77	718	1131.3	1544	1336	2000.6	118	1335	20
325	21	Śro	426	16.14323	14.15	15.4603	-19.53	0.98787	0.4718	8.41	56.932	3.5	86	720	1131.5	1543	1348	2051.2	246	1331	21
326	22	Czw	427	16.18289	13.60	15.5015	-20.06	0.98767	1.4221	15.04	56.363	4.5	93	721	1131.8	1542	1402	2145.9	418	1327	22
327	23	Pią	428	16.22254	13.44	15.5428	-20.19	0.98747	2.4136	20.41	56.050	5.5	98	723	1132.0	1540	1422	2245.5	555	1323	23
328	24	Sob	429	16.26220	13.27	15.5841	-20.31	0.98727	3.4514	24.57	56.035	6.5	100	725	1132.3	1539	1451	2349.6	734	1319	24
329	25	Nie	430	16.30186	13.09	16.0255	-20.43	0.98709	4.5206	27.26	56.326	0.9	99	726	1132.6	1538	1536	*****	905	1315	25
330	26	Pon	431	16.34151	12.51	16.0710	-20.55	0.98690	5.5938	27.52	56.897	1.9	95	728	1132.9	1537	1642	056.3	1019	1311	26
331	27	Wto	432	16.38117	12.32	16.1125	-21.06	0.98672	7.0447	26.20	57.690	2.9	88	730	1133.2	1536	1804	201.7	1109	1308	27
332	28	Śro	433	16.42082	12.12	16.1542	-21.17	0.98655	8.0523	23.08	58.628	3.9	80	731	1133.5	1535	1932	302.8	1140	1304	28
333	29	Czw	434	16.46048	11.52	16.1959	-21.27	0.98638	9.0041	18.46	59.626	4.9	71	733	1133.9	1534	2058	358.0	1201	1300	29
334	30	Pią	435	16.50014	11.30	16.2417	-21.37	0.98622	9.5110	13.37	60.607	5.9	61	734	1134.2	1534	2219	447.7	1216	1256	30

Fazy Księżyca [Dm, h.mm]: 3kw 1, 22.18 Nów 10, 0.03 1kw 17, 23.32 Pełn 24, 15.30

LISTOPAD 2007 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.46	18.13	5.12	15.55	2.16	14.59	19.22	12.24	10.31	18.08	0.41	14.41	14.42	1.41	13.53	23.09	10.24	19.21		
	14.417	-14.38	13.479	-7.69	11.537	3.54	6.815	23.96	17.255	-22.77	10.588	10.46	23.099	-6.65	21.452	-15.32	17.801	-16.87	2.66044	1
3	4.49	18.10	5.04	15.50	2.19	14.56	19.15	12.18	10.25	18.02	0.34	14.33	14.34	1.33	13.45	23.01	10.17	19.13		
	14.548	-15.02	13.499	-7.44	11.668	2.89	6.840	24.02	17.283	-22.80	10.598	10.41	23.097	-6.66	21.452	-15.32	17.805	-16.88	2.79186	3
5	4.52	18.07	5.01	15.45	2.23	14.52	19.08	12.12	10.20	17.55	0.27	14.25	14.26	1.24	13.37	22.53	10.09	19.05		
	14.680	-15.63	13.560	-7.54	11.800	2.21	6.861	24.08	17.312	-22.84	10.608	10.36	23.095	-6.67	21.453	-15.32	17.809	-16.89	2.92327	5
7	4.55	18.04	5.01	15.41	2.27	14.49	19.01	12.06	10.14	17.49	0.20	14.18	14.18	1.16	13.29	22.45	10.01	18.58		
	14.812	-16.23	13.655	-7.94	11.934	1.51	6.879	24.14	17.342	-22.87	10.617	10.31	23.093	-6.68	21.453	-15.31	17.813	-16.89	3.05469	7
9	4.59	18.01	5.04	15.37	2.31	14.45	18.53	11.59	10.08	17.43	0.13	14.10	14.10	1.08	13.22	22.37	9.54	18.50		
	14.946	-16.82	13.777	-8.59	12.068	0.80	6.893	24.22	17.371	-22.90	10.626	10.26	23.091	-6.69	21.454	-15.31	17.817	-16.90	3.18611	9
11	5.02	17.58	5.09	15.33	2.35	14.41	18.45	11.53	10.02	17.36	0.06	14.03	14.03	1.00	13.14	22.30	9.46	18.42		
	15.081	-17.38	13.921	-9.42	12.204	0.07	6.904	24.30	17.401	-22.93	10.635	10.22	23.090	-6.70	21.454	-15.31	17.821	-16.91	3.31753	11
13	5.05	17.55	5.16	15.29	2.39	14.38	18.37	11.46	9.56	17.30	23.55	13.55	13.55	0.52	13.06	22.22	9.39	18.35		
	15.216	-17.92	14.082	-10.38	12.340	-0.68	6.910	24.38	17.431	-22.96	10.643	10.18	23.089	-6.70	21.455	-15.30	17.825	-16.92	3.44895	13
15	5.08	17.53	5.24	15.26	2.44	14.34	18.29	11.39	9.50	17.24	23.48	13.47	13.47	0.45	12.58	22.14	9.31	18.27		
	15.353	-18.45	14.255	-11.41	12.478	-1.43	6.912	24.47	17.462	-22.99	10.651	10.14	23.088	-6.71	21.456	-15.30	17.830	-16.93	3.58038	15
17	5.11	17.51	5.34	15.23	2.48	14.30	18.20	11.32	9.45	17.18	23.40	13.40	13.39	0.37	12.50	22.06	9.24	18.19		
	15.490	-18.95	14.437	-12.50	12.616	-2.20	6.911	24.57	17.493	-23.01	10.659	10.10	23.087	-6.71	21.457	-15.29	17.834	-16.94	3.71180	17
19	5.14	17.49	5.44	15.20	2.53	14.27	18.11	11.24	9.39	17.11	23.33	13.32	13.31	0.29	12.42	21.59	9.16	18.12		
	15.628	-19.43	14.627	-13.61	12.755	-2.98	6.905	24.68	17.524	-23.04	10.666	10.07	23.086	-6.71	21.459	-15.29	17.839	-16.95	3.84322	19
21	5.17	17.47	5.54	15.17	2.57	14.23	18.02	11.17	9.33	17.05	23.26	13.25	13.23	0.21	12.35	21.51	9.09	18.04		
	15.768	-19.88	14.822	-14.72	12.895	-3.76	6.895	24.79	17.555	-23.06	10.673	10.04	23.086	-6.72	21.460	-15.28	17.843	-16.95	3.97463	21
23	5.19	17.45	6.05	15.14	3.02	14.19	17.52	11.09	9.27	16.59	23.19	13.17	13.15	0.13	12.27	21.43	9.01	17.56		
	15.908	-20.31	15.022	-15.81	13.037	-4.55	6.881	24.91	17.586	-23.09	10.679	10.01	23.085	-6.72	21.462	-15.27	17.848	-16.96	4.10605	23
25	5.22	17.44	6.16	15.12	3.07	14.16	17.42	11.01	9.21	16.53	23.11	13.09	13.07	0.05	12.19	21.35	8.53	17.49		
	16.049	-20.72	15.226	-16.88	13.179	-5.35	6.863	25.03	17.618	-23.11	10.685	9.98	23.085	-6.71	21.464	-15.26	17.852	-16.97	4.23748	25
27	5.25	17.42	6.27	15.10	3.12	14.12	17.32	10.53	9.15	16.47	23.04	13.02	12.60	23.53	12.11	21.28	8.46	17.41		
	16.190	-21.10	15.432	-17.90	13.322	-6.15	6.840	25.16	17.650	-23.13	10.690	9.96	23.086	-6.71	21.466	-15.25	17.857	-16.97	4.36890	27
29	5.27	17.41	6.38	15.09	3.17	14.09	17.21	10.45	9.10	16.41	22.56	12.54	12.52	23.45	12.03	21.20	8.38	17.34		
	16.333	-21.45	15.642	-18.88	13.467	-6.95	6.813	25.29	17.682	-23.15	10.695	9.93	23.086	-6.71	21.468	-15.24	17.862	-16.98	4.50032	29

GRUDZIEŃ 2007

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)											Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2454																			
335	1	Sob	436	16.53579	11.09	16.2835	-21.47	0.98606	10.3754	8.03	61.504	6.9	51	736	1134.6	1533	2336	532.8	1227	1252	1	
336	2	Nie	437	16.57545	10.46	16.3254	-21.56	0.98591	11.2207	2.20	62.272	0.9	41	737	1135.0	1532	****	614.8	1236	1248	2	
337	3	Pon	438	17.01510	10.23	16.3714	-22.05	0.98576	12.0502	-3.21	62.879	1.9	32	739	1135.4	1531	050	655.0	1245	1244	3	
338	4	Wto	439	17.05476	9.59	16.4134	-22.13	0.98562	12.4748	-8.50	63.315	2.9	23	740	1135.8	1531	202	734.9	1254	1240	4	
339	5	Śro	440	17.09441	9.34	16.4555	-22.21	0.98548	13.3125	-13.58	63.581	3.9	16	742	1136.2	1530	314	815.4	1304	1236	5	
340	6	Czw	441	17.13407	9.09	16.5017	-22.28	0.98534	14.1644	-18.34	63.687	4.9	9	743	1136.6	1530	428	857.7	1317	1232	6	
341	7	Pią	442	17.17372	8.44	16.5439	-22.35	0.98520	15.0425	-22.27	63.655	5.9	5	744	1137.0	1529	543	942.6	1334	1228	7	
342	8	Sob	443	17.21338	8.18	16.5902	-22.42	0.98507	15.5445	-25.26	63.503	6.9	2	746	1137.4	1529	657	1030.3	1357	1224	8	
343	9	Nie	444	17.25304	7.51	17.0325	-22.48	0.98494	16.4731	-27.18	63.254	7.9	0	747	1137.9	1529	807	1120.7	1431	1220	9	
344	10	Pon	445	17.29269	7.24	17.0748	-22.54	0.98482	17.4159	-27.54	62.923	0.7	0	748	1138.3	1529	907	1213.1	1519	1216	10	
345	11	Wto	446	17.33235	6.57	17.1212	-22.59	0.98470	18.3659	-27.08	62.521	1.7	3	749	1138.8	1528	954	1306.0	1622	1213	11	
346	12	Śro	447	17.37201	6.29	17.1637	-23.04	0.98458	19.3116	-25.02	62.056	2.7	7	750	1139.3	1528	1027	1358.0	1736	1209	12	
347	13	Czw	448	17.41166	6.01	17.2101	-23.08	0.98446	20.2358	-21.41	61.528	3.7	13	751	1139.7	1528	1051	1448.3	1856	1205	13	
348	14	Pią	449	17.45132	5.32	17.2527	-23.12	0.98435	21.1444	-17.17	60.940	4.7	20	752	1140.2	1528	1108	1536.4	2017	1201	14	
349	15	Sob	450	17.49097	5.04	17.2952	-23.16	0.98425	22.0347	-12.00	60.295	5.7	29	753	1140.7	1528	1121	1622.8	2139	1157	15	
350	16	Nie	451	17.53063	4.35	17.3417	-23.19	0.98414	22.5152	-6.06	59.606	6.7	39	754	1141.2	1528	1132	1708.2	2301	1153	16	
351	17	Pon	452	17.57028	4.05	17.3843	-23.21	0.98405	23.3956	0.13	58.894	0.0	50	755	1141.7	1529	1142	1753.9	****	1149	17	
352	18	Wto	453	18.00594	3.36	17.4309	-23.23	0.98395	0.2915	6.40	58.194	1.0	61	755	1142.1	1529	1153	1841.3	024	1145	18	
353	19	Śro	454	18.04560	3.06	17.4735	-23.25	0.98387	1.2105	12.57	57.555	2.0	72	756	1142.6	1529	1206	1932.0	151	1141	19	
354	20	Czw	455	18.08525	2.37	17.5201	-23.26	0.98378	2.1641	18.40	57.033	3.0	82	757	1143.1	1529	1222	2027.1	322	1137	20	
355	21	Pią	456	18.12491	2.07	17.5628	-23.26	0.98371	3.1648	23.23	56.689	4.0	90	757	1143.6	1530	1246	2127.4	457	1133	21	
356	22	Sob	457	18.16456	1.37	18.0054	-23.26	0.98364	4.2114	26.35	56.571	5.0	96	758	1144.1	1530	1321	2232.0	631	1129	22	
357	23	Nie	458	18.20422	1.08	18.0520	-23.26	0.98357	5.2816	27.54	56.711	6.0	99	758	1144.6	1531	1416	2338.3	754	1125	23	
358	24	Pon	459	18.24388	0.38	18.0947	-23.25	0.98352	6.3505	27.11	57.110	0.4	100	759	1145.1	1532	1531	*****	855	1121	24	
359	25	Wto	460	18.28353	0.08	18.1413	-23.24	0.98347	7.3846	24.36	57.742	1.4	97	759	1145.6	1532	1659	042.7	936	1117	25	
360	26	Śro	461	18.32319	-0.22	18.1839	-23.22	0.98342	8.3737	20.33	58.553	2.4	92	759	1146.1	1533	1829	142.2	1002	1114	26	
361	27	Czw	462	18.36284	-0.51	18.2305	-23.20	0.98338	9.3122	15.30	59.470	3.4	85	800	1146.6	1534	1956	236.0	1020	1110	27	
362	28	Pią	463	18.40250	-1.21	18.2731	-23.17	0.98335	10.2044	9.54	60.417	4.4	77	800	1147.1	1535	2117	324.5	1032	1106	28	
363	29	Sob	464	18.44216	-1.50	18.3157	-23.14	0.98333	11.0651	4.03	61.319	5.4	68	800	1147.6	1535	2233	409.0	1043	1102	29	
364	30	Nie	465	18.48181	-2.19	18.3623	-23.11	0.98331	11.5100	-1.48	62.115	6.4	58	800	1148.1	1536	2347	450.9	1052	1058	30	
365	31	Pon	466	18.52147	-2.48	18.4048	-23.07	0.98329	12.3422	-7.26	62.757	0.1	49	800	1148.5	1537	****	531.6	1101	1054	31	

Fazy Księżyca [Dm, h.mm]: 3kw 1, 13.44 Now 9, 18.40 1kw 17, 11.17 Pełn 24, 2.16 3kw 31, 8.51

GRUDZIEŃ 2007 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	5.30	17.40	6.49	15.07	3.23	14.05	17.10	10.36	9.04	16.35	22.49	12.46	12.44	23.38	11.56	21.12	8.31	17.26		
	16.476	-21.78	15.854	-19.80	13.612	-7.74	6.782	25.42	17.715	-23.17	10.700	9.91	23.087	-6.70	21.470	-15.23	17.867	-16.99	4.63174	1
3	5.32	17.39	6.60	15.06	3.28	14.02	16.59	10.27	8.58	16.29	22.41	12.38	12.36	23.30	11.48	21.05	8.23	17.18		
	16.621	-22.08	16.069	-20.66	13.759	-8.54	6.747	25.56	17.747	-23.18	10.704	9.90	23.087	-6.70	21.472	-15.22	17.872	-16.99	4.76316	3
5	5.34	17.39	7.10	15.06	3.33	13.58	16.48	10.18	8.52	16.23	22.34	12.31	12.28	23.22	11.40	20.57	8.16	17.11		
	16.765	-22.35	16.286	-21.46	13.907	-9.33	6.708	25.70	17.780	-23.20	10.708	9.89	23.088	-6.69	21.475	-15.21	17.877	-17.00	4.89458	5
7	5.37	17.38	7.21	15.06	3.39	13.55	16.36	10.09	8.46	16.17	22.26	12.23	12.20	23.14	11.32	20.49	8.08	17.03		
	16.911	-22.59	16.505	-22.19	14.056	-10.11	6.666	25.83	17.812	-23.21	10.711	9.87	23.090	-6.68	21.477	-15.20	17.882	-17.01	5.02600	7
9	5.39	17.38	7.31	15.07	3.44	13.52	16.24	9.60	8.41	16.11	22.19	12.15	12.12	23.07	11.24	20.42	8.01	16.56		
	17.057	-22.80	16.727	-22.85	14.206	-10.88	6.620	25.96	17.845	-23.22	10.714	9.87	23.091	-6.67	21.480	-15.19	17.887	-17.01	5.15743	9
11	5.41	17.38	7.41	15.08	3.50	13.49	16.12	9.50	8.35	16.05	22.11	12.08	12.05	22.59	11.17	20.34	7.53	16.48		
	17.203	-22.99	16.951	-23.43	14.357	-11.65	6.571	26.09	17.878	-23.23	10.716	9.86	23.093	-6.66	21.483	-15.17	17.892	-17.02	5.28885	11
13	5.42	17.38	7.50	15.10	3.55	13.45	16.00	9.40	8.29	15.59	22.03	11.60	11.57	22.51	11.09	20.27	7.46	16.40		
	17.350	-23.14	17.177	-23.93	14.510	-12.40	6.519	26.22	17.911	-23.24	10.718	9.86	23.095	-6.64	21.486	-15.16	17.897	-17.02	5.42027	13
15	5.44	17.38	7.59	15.12	4.01	13.43	15.48	9.30	8.23	15.53	21.55	11.52	11.49	22.44	11.01	20.19	7.38	16.33		
	17.498	-23.26	17.405	-24.35	14.664	-13.14	6.465	26.34	17.944	-23.24	10.719	9.86	23.097	-6.63	21.489	-15.14	17.902	-17.03	5.55169	15
17	5.45	17.39	8.08	15.15	4.07	13.40	15.36	9.20	8.17	15.47	21.48	11.44	11.41	22.36	10.53	20.11	7.31	16.25		
	17.645	-23.35	17.635	-24.68	14.819	-13.86	6.409	26.45	17.977	-23.25	10.720	9.86	23.099	-6.61	21.492	-15.13	17.907	-17.03	5.68311	17
19	5.47	17.40	8.16	15.19	4.12	13.37	15.24	9.10	8.11	15.41	21.40	11.36	11.33	22.28	10.46	20.04	7.23	16.18		
	17.793	-23.41	17.866	-24.93	14.976	-14.56	6.352	26.55	18.011	-23.25	10.721	9.87	23.102	-6.60	21.495	-15.11	17.912	-17.04	5.81453	19
21	5.48	17.40	8.23	15.24	4.18	13.34	15.11	8.59	8.06	15.35	21.32	11.29	11.26	22.21	10.38	19.56	7.16	16.10		
	17.941	-23.44	18.099	-25.09	15.133	-15.25	6.293	26.64	18.044	-23.25	10.721	9.88	23.104	-6.58	21.499	-15.10	17.917	-17.04	5.94595	21
23	5.49	17.41	8.30	15.30	4.24	13.32	14.59	8.49	7.60	15.29	21.24	11.21	11.18	22.13	10.30	19.49	7.08	16.02		
	18.089	-23.43	18.334	-25.15	15.293	-15.91	6.235	26.72	18.077	-23.25	10.720	9.89	23.107	-6.56	21.502	-15.08	17.922	-17.04	6.07738	23
25	5.50	17.43	8.36	15.36	4.29	13.30	14.47	8.38	7.54	15.23	21.16	11.13	11.10	22.06	10.22	19.41	7.00	15.55		
	18.237	-23.40	18.569	-25.12	15.453	-16.56	6.176	26.79	18.110	-23.25	10.719	9.91	23.110	-6.54	21.506	-15.06	17.928	-17.05	6.20880	25
27	5.50	17.44	8.41	15.44	4.35	13.28	14.35	8.27	7.48	15.17	21.08	11.05	11.02	21.58	10.15	19.34	6.53	15.47		
	18.385	-23.33	18.805	-24.98	15.616	-17.17	6.118	26.85	18.144	-23.25	10.718	9.92	23.114	-6.52	21.510	-15.04	17.933	-17.05	6.34023	27
29	5.51	17.45	8.45	15.52	4.41	13.26	14.24	8.16	7.42	15.12	20.60	10.57	10.54	21.51	10.07	19.26	6.45	15.40		
	18.533	-23.24	19.041	-24.75	15.779	-17.76	6.061	26.90	18.177	-23.25	10.716	9.94	23.117	-6.49	21.514	-15.02	17.938	-17.05	6.47165	29
31	5.51	17.47	8.49	16.01	4.46	13.24	14.12	8.05	7.36	15.06	20.52	10.49	10.47	21.43	9.59	19.19	6.38	15.32		
	18.680	-23.11	19.277	-24.42	15.944	-18.32	6.005	26.93	18.210	-23.24	10.714	9.96	23.121	-6.47	21.518	-15.01	17.943	-17.06	6.60306	31

Święta państwowe i kościelne w Polsce oraz inne ważniejsze dni w roku 2007

Nowy Rok	Pon	1 styczeń	Zesłania Ducha Świętego	Nie	27 maj
Najświętszej Maryi Panny Rodzicielki	Pon	1 styczeń	Dzień Dziecka	Pią	1 czerwiec
Objawienia Pańskiego (Trzech Króli)	Sob	6 styczeń	Trójcy Najświętszej	Nie	3 czerwiec
Juliański Nowy Rok	Nie	14 styczeń	Dzień Dziękczynienia	Nie	3 czerwiec
Dzień Babci	Nie	21 styczeń	Boże Ciało	Czw	7 czerwiec
Dzień Dziadka	Pon	22 styczeń	Najświętszego Serca Pana Jezusa	Pią	15 czerwiec
Ofiarowania Pańskiego	Pią	2 luty	Dzień Ojca	Sob	23 czerwiec
Matki Boskiej Gromnicznej	Pią	2 luty	Noc Świętojańska	Sob	23 czerwiec
Walentynki	Śro	14 luty	Św. Piotra i Pawła	Pią	29 czerwiec
Tłusty czwartek	Czw	15 luty	Wniebowzięcia N.M.P.	Śro	15 sierpień
Święto UMK	Pon	19 luty	Święto Wojska Polskiego	Śro	15 sierpień
Środa Popielcowa	Śro	21 luty	Dzień Solidarności i Wolności	Pią	31 sierpień
Dzień Kobiet	Czw	8 marzec	Dzień Programisty	Czw	13 wrzesień
Narodowy Dzień Życia	Sob	24 marzec	Dożynki – Święto Plonów	Nie	23 wrzesień
Niedziela Palmowa	Nie	1 kwiecień	Dzień Papieski	Nie	14 październik
Niedziela Wielkanocna	Nie	8 kwiecień	Dzień Edukacji Narodowej	Nie	14 październik
Niedziela Miłosierdzia Bożego	Nie	15 kwiecień	Dzień Papieża Jana Pawła II	Wto	16 październik
Święto Pracy	Wto	1 maj	Wszystkich Świętych	Czw	1 listopad
Dzień Flagi Rzeczypospolitej Polskiej	Śro	2 maj	Zaduszki	Pią	2 listopad
Najświętsza Maryja Królowa Polski	Czw	3 maj	Święto Niepodległości	Nie	11 listopad
Święto Konstytucji 3 Maja	Czw	3 maj	Pierwsza niedziela Adventu	Nie	2 grudzień
Dzień Polskiej Niezapominajki	Wto	15 maj	Niepokalane Poczęcie N.M.P.	Sob	8 grudzień
Wniebowstąpienia Pańskiego	Czw	17 maj	Boże Narodzenie	Wto	25 grudzień
Dzień Matki	Sob	26 maj	Sylwester	Pon	31 grudzień

Kalendarz astronomiczny 2008

PIWNICE, CA UMK

Współrzędne geograficzne: 18.5641°E 53.0955°N, Nr strefy czasowej (> 0 , gdy na wschód) = 1 (CSE)

Kalendarz jest gregoriańskim i jest oparty na efemerydach Układu Słonecznego obliczanych z dokładnością 1' (Słońce 2", Księżyc 10", Pluton 15'). Czas gwiazdowy ma dokładność około 0.1 s. Wschody i zachody obliczono z uwzględnieniem horyzontalnej refrakcji astronomicznej (34'), rozciągłości Słońca lub Księżyca i paralaksy horyzontalnej Księżyca. Dla dat odległych o więcej niż ok. 300 lat od roku 1950 dokładności położenia planet są gorsze niż 1'!
(Kalendarz ten opracowano [KMB] w Katedrze Radioastronomii CA UMK, Toruń—Piwnice. Oblicz. dnia 7.10.2010 r.)

Data Wielkanocy: **2008 MARZEC 23**

Dla całego roku przyjęto: TDT – UT = 66 s

Pory roku [miesiąc dzień, godz. mm] (czas zimowy): Wiosna **III 20, 6.48**, Lato **VI 21, 0.59**, Jesień **IX 22, 16.45**, Zima **XII 21, 13.04**

Dane w czasie letnim odróżniono kolorem brązowym; czas ten obowiązuje **od 30 marca do 26 października 2008 r.**

Oznaczenia:

Dr — dzień 2008 roku (1 stycznia Dr = 1)

Dm — dzień miesiąca

Dt — dzień tygodnia

JD — data juliańska modulo 1000 o 12^h UT

(po nagłówku: Entier(JD/1000) dla Dm = 1)

ST — prawdziwy czas gwiazdowy

$\Delta\alpha$ — różnica czasu (czas słoneczny prawdziwy minus średni)

α — rektascensja (Słońca lub Księżyca)

δ — deklinacja (Słońca lub Księżyca)

R — odległość (Słońca lub Księżyca)

j astr — jednostka astronomiczna

ρ_{\oplus} — promień Ziemi

Faza \leftarrow dni po kwadrze i % oświetlonej części tarczy Księżyca

Wsch — wschód (Słońca, Księżyca lub planety)

Gór — górowanie czyli tranzyt (Gal. = centrum Galaktyki)

Zach — zachód (Słońca, Księżyca lub planety)

STYCZEŃ 2008

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)											Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2454																			
1	1	Wto	467	18.56112	-3.17	18.4513	-23.02	0.98328	13.1802	-12.43	63.216	1.1	39	800	1149.0	1538	101	612.2	1111	1050	1	
2	2	Śro	468	19.00078	-3.45	18.4938	-22.57	0.98328	14.0260	-17.29	63.479	2.1	30	800	1149.5	1540	214	654.1	1123	1046	2	
3	3	Czw	469	19.04043	-4.13	18.5403	-22.52	0.98328	14.5001	-21.34	63.549	3.1	22	759	1150.0	1541	328	738.0	1138	1042	3	
4	4	Pią	470	19.08009	-4.41	18.5827	-22.46	0.98328	15.3935	-24.48	63.443	4.1	15	759	1150.4	1542	443	824.6	1159	1038	4	
5	5	Sob	471	19.11575	-5.08	19.0251	-22.39	0.98329	16.3146	-26.58	63.188	5.1	9	759	1150.9	1543	555	914.2	1229	1034	5	
6	6	Nie	472	19.15540	-5.35	19.0714	-22.32	0.98330	17.2603	-27.55	62.816	6.1	4	759	1151.3	1544	659	1006.2	1312	1030	6	
7	7	Pon	473	19.19506	-6.01	19.1137	-22.25	0.98332	18.2126	-27.30	62.363	7.1	1	758	1151.8	1546	751	1059.5	1411	1026	7	
8	8	Wto	474	19.23471	-6.27	19.1560	-22.17	0.98334	19.1636	-25.41	61.859	8.1	0	758	1152.2	1547	829	1152.6	1523	1022	8	
9	9	Śro	475	19.27437	-6.53	19.2022	-22.09	0.98337	20.1027	-22.34	61.333	1.0	1	757	1152.6	1548	856	1244.3	1643	1019	9	
10	10	Czw	476	19.31403	-7.17	19.2443	-22.01	0.98339	21.0222	-18.19	60.805	2.0	4	756	1153.0	1550	915	1333.8	1805	1015	10	
11	11	Pią	477	19.35368	-7.42	19.2904	-21.52	0.98342	21.5219	-13.08	60.287	3.0	9	756	1153.4	1551	929	1421.2	1928	1011	11	
12	12	Sob	478	19.39334	-8.05	19.3324	-21.42	0.98346	22.4049	-7.18	59.785	4.0	16	755	1153.8	1553	941	1507.0	2050	1007	12	
13	13	Nie	479	19.43299	-8.29	19.3744	-21.32	0.98350	23.2844	-1.03	59.302	5.0	25	754	1154.2	1555	951	1552.4	2212	1003	13	
14	14	Pon	480	19.47265	-8.51	19.4203	-21.22	0.98354	0.1708	5.21	58.841	6.0	35	753	1154.6	1556	1001	1638.5	2336	959	14	
15	15	Wto	481	19.51230	-9.13	19.4621	-21.12	0.98359	1.0714	11.34	58.411	7.0	46	753	1155.0	1558	1013	1726.7	****	955	15	
16	16	Śro	482	19.55196	-9.34	19.5039	-21.00	0.98365	2.0015	17.19	58.028	0.6	57	752	1155.3	1559	1027	1818.5	103	951	16	
17	17	Czw	483	19.59162	-9.54	19.5456	-20.49	0.98371	2.5707	22.11	57.719	1.6	68	751	1155.7	1601	1046	1914.7	234	947	17	
18	18	Pią	484	20.03127	-10.14	19.5912	-20.37	0.98377	3.5806	25.47	57.516	2.6	79	750	1156.0	1603	1115	2015.4	406	943	18	
19	19	Sob	485	20.07093	-10.33	20.0328	-20.25	0.98384	5.0223	27.43	57.452	3.6	87	749	1156.3	1604	1159	2119.2	532	939	19	
20	20	Nie	486	20.11058	-10.51	20.0743	-20.12	0.98392	6.0754	27.46	57.558	4.6	94	747	1156.6	1606	1304	2223.2	641	935	20	
21	21	Pon	487	20.15024	-11.09	20.1157	-19.59	0.98400	7.1200	25.55	57.849	5.6	98	746	1156.9	1608	1426	2324.5	730	931	21	
22	22	Wto	488	20.18590	-11.26	20.1610	-19.46	0.98409	8.1233	22.25	58.324	6.6	100	745	1157.2	1610	1555	*****	802	927	22	
23	23	Śro	489	20.22555	-11.42	20.2023	-19.32	0.98419	9.0833	17.43	58.958	0.9	99	744	1157.4	1612	1725	021.0	823	923	23	
24	24	Czw	490	20.26521	-11.57	20.2434	-19.18	0.98429	10.0012	12.12	59.708	1.9	96	743	1157.7	1613	1850	112.4	838	920	24	
25	25	Pią	491	20.30486	-12.11	20.2845	-19.03	0.98439	10.4819	6.18	60.517	2.9	90	741	1157.9	1615	2010	159.5	849	916	25	
26	26	Sob	492	20.34452	-12.25	20.3255	-18.48	0.98451	11.3359	0.17	61.321	3.9	83	740	1158.2	1617	2127	243.4	859	912	26	
27	27	Nie	493	20.38417	-12.38	20.3705	-18.33	0.98463	12.1823	-5.34	62.057	4.9	75	738	1158.4	1619	2242	325.4	908	908	27	
28	28	Pon	494	20.42383	-12.50	20.4113	-18.18	0.98475	13.0233	-11.05	62.670	5.9	66	737	1158.6	1621	2356	406.7	918	904	28	
29	29	Wto	495	20.46348	-13.01	20.4521	-18.02	0.98488	13.4731	-16.06	63.117	6.9	57	735	1158.8	1623	****	448.6	929	900	29	
30	30	Śro	496	20.50314	-13.11	20.4928	-17.46	0.98502	14.3404	-20.27	63.370	0.2	48	734	1158.9	1625	111	531.9	942	856	30	
31	31	Czw	497	20.54280	-13.21	20.5334	-17.29	0.98516	15.2251	-23.58	63.417	1.2	38	732	1159.1	1627	226	617.6	1001	852	31	

Fazy Księżyca [Dm, h.mm]: 3kw 0, 8.51 Now 8, 12.37 1kw 15, 20.46 Pełn 22, 14.35 3kw 30, 6.03

STYCZEŃ 2008 (c.d.)

Świty, zmierny astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	5.51	17.48	8.51	16.05	4.49	13.24	14.06	7.60	7.33	15.03	20.47	10.45	10.43	21.39	9.55	19.15	6.34	15.28		
	18.754	-23.03	19.395	-24.21	16.027	-18.59	5.978	26.95	18.227	-23.24	10.713	9.98	23.123	-6.46	21.520	-15.00	17.945	-17.06	6.66877	1
3	5.51	17.50	8.53	16.15	4.55	13.22	13.55	7.49	7.27	14.57	20.39	10.38	10.35	21.32	9.48	19.07	6.27	15.21		
	18.901	-22.86	19.630	-23.72	16.194	-19.11	5.926	26.97	18.260	-23.23	10.710	10.00	23.126	-6.43	21.524	-14.98	17.950	-17.06	6.80019	3
5	5.51	17.52	8.55	16.26	5.00	13.21	13.44	7.38	7.21	14.51	20.31	10.30	10.27	21.24	9.40	18.60	6.19	15.13		
	19.047	-22.65	19.863	-23.13	16.362	-19.60	5.876	26.98	18.293	-23.22	10.706	10.03	23.131	-6.40	21.528	-14.96	17.955	-17.06	6.93162	5
7	5.51	17.54	8.55	16.37	5.05	13.21	13.34	7.28	7.15	14.45	20.23	10.22	10.19	21.17	9.32	18.52	6.11	15.06		
	19.194	-22.42	20.093	-22.43	16.531	-20.05	5.829	26.98	18.326	-23.21	10.702	10.06	23.135	-6.38	21.532	-14.94	17.960	-17.06	7.06304	7
9	5.50	17.56	8.55	16.48	5.11	13.20	13.23	7.17	7.09	14.40	20.14	10.14	10.12	21.09	9.24	18.45	6.04	14.58		
	19.339	-22.16	20.319	-21.64	16.702	-20.46	5.785	26.98	18.359	-23.19	10.698	10.10	23.139	-6.35	21.536	-14.91	17.965	-17.06	7.19447	9
11	5.50	17.59	8.54	16.60	5.16	13.20	13.13	7.07	7.03	14.34	20.06	10.06	10.04	21.02	9.17	18.37	5.56	14.50		
	19.484	-21.86	20.539	-20.75	16.874	-20.84	5.745	26.97	18.392	-23.18	10.693	10.13	23.144	-6.32	21.541	-14.89	17.970	-17.07	7.32589	11
13	5.49	18.01	8.53	17.11	5.20	13.20	13.03	6.57	6.57	14.28	19.58	9.58	9.56	20.55	9.09	18.30	5.49	14.43		
	19.629	-21.54	20.752	-19.78	17.047	-21.18	5.708	26.95	18.424	-23.16	10.688	10.17	23.149	-6.29	21.545	-14.87	17.975	-17.07	7.45730	13
15	5.48	18.04	8.50	17.23	5.25	13.20	12.53	6.47	6.51	14.22	19.49	9.50	9.48	20.47	9.01	18.23	5.41	14.35		
	19.773	-21.19	20.954	-18.73	17.220	-21.48	5.676	26.93	18.457	-23.14	10.683	10.21	23.154	-6.25	21.550	-14.85	17.980	-17.07	7.58872	15
17	5.46	18.07	8.46	17.33	5.30	13.21	12.44	6.37	6.45	14.17	19.41	9.42	9.41	20.40	8.53	18.15	5.34	14.28		
	19.916	-20.82	21.143	-17.63	17.395	-21.75	5.647	26.90	18.489	-23.12	10.677	10.26	23.159	-6.22	21.554	-14.83	17.984	-17.07	7.72014	17
19	5.45	18.09	8.41	17.43	5.34	13.22	12.35	6.27	6.39	14.11	19.32	9.34	9.33	20.32	8.46	18.08	5.26	14.20		
	20.058	-20.41	21.314	-16.50	17.570	-21.97	5.622	26.87	18.522	-23.10	10.670	10.30	23.164	-6.19	21.559	-14.81	17.989	-17.07	7.85157	19
21	5.43	18.12	8.35	17.51	5.38	13.24	12.26	6.18	6.33	14.05	19.24	9.26	9.25	20.25	8.38	18.00	5.18	14.12		
	20.199	-19.99	21.462	-15.37	17.746	-22.15	5.602	26.84	18.554	-23.08	10.664	10.35	23.169	-6.15	21.564	-14.78	17.994	-17.07	7.98299	21
23	5.41	18.15	8.28	17.56	5.41	13.25	12.18	6.09	6.27	13.59	19.15	9.18	9.17	20.18	8.30	17.53	5.11	14.05		
	20.340	-19.53	21.581	-14.29	17.923	-22.28	5.585	26.81	18.585	-23.06	10.657	10.40	23.175	-6.12	21.569	-14.76	17.998	-17.07	8.11441	23
25	5.39	18.18	8.20	17.59	5.45	13.27	12.09	5.60	6.21	13.53	19.07	9.10	9.10	20.10	8.23	17.45	5.03	13.57		
	20.479	-19.06	21.665	-13.31	18.100	-22.37	5.573	26.78	18.617	-23.03	10.649	10.45	23.180	-6.08	21.573	-14.74	18.002	-17.07	8.24583	25
27	5.37	18.21	8.10	17.59	5.48	13.30	12.01	5.51	6.14	13.48	18.58	9.02	9.02	20.03	8.15	17.38	4.56	13.50		
	20.618	-18.55	21.708	-12.50	18.277	-22.42	5.564	26.74	18.648	-23.01	10.642	10.50	23.186	-6.04	21.578	-14.71	18.007	-17.07	8.37725	27
29	5.35	18.24	7.58	17.54	5.51	13.32	11.53	5.43	6.08	13.42	18.49	8.54	8.54	19.56	8.07	17.30	4.48	13.42		
	20.756	-18.03	21.704	-11.89	18.454	-22.43	5.560	26.71	18.679	-22.98	10.634	10.56	23.192	-6.01	21.583	-14.69	18.011	-17.06	8.50867	29
31	5.32	18.28	7.45	17.45	5.53	13.35	11.46	5.34	6.02	13.36	18.41	8.46	8.47	19.48	7.59	17.23	4.40	13.34		
	20.893	-17.49	21.652	-11.55	18.632	-22.39	5.559	26.68	18.710	-22.95	10.626	10.61	23.198	-5.97	21.588	-14.67	18.015	-17.06	8.64009	31

LUTY 2008

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]									
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2454																			
32	1	Pią	498	20.58245	-13.30	20.5740	-17.12	0.98530	16.1406	-26.30	63.262	2.2	29	731	1159.2	1628	340	705.9	1026	848	1	
33	2	Sob	499	21.02211	-13.38	21.0144	-16.55	0.98545	17.0735	-27.50	62.926	3.2	21	729	1159.4	1630	447	756.8	1104	844	2	
34	3	Nie	500	21.06176	-13.45	21.0548	-16.38	0.98560	18.0235	-27.52	62.442	4.2	14	727	1159.5	1632	544	849.5	1156	840	3	
35	4	Pon	501	21.10142	-13.52	21.0951	-16.20	0.98575	18.5759	-26.30	61.851	5.2	8	726	1159.6	1634	627	942.9	1303	836	4	
36	5	Wto	502	21.14108	-13.57	21.1353	-16.02	0.98591	19.5240	-23.46	61.202	6.2	3	724	1159.7	1636	658	1035.6	1421	832	5	
37	6	Śro	503	21.18073	-14.02	21.1755	-15.44	0.98607	20.4549	-19.48	60.544	7.2	1	722	1159.8	1638	720	1126.6	1545	828	6	
38	7	Czw	504	21.22039	-14.06	21.2155	-15.25	0.98623	21.3712	-14.47	59.922	0.3	0	720	1159.8	1640	736	1215.7	1709	825	7	
39	8	Pią	505	21.26004	-14.09	21.2555	-15.07	0.98640	22.2703	-8.58	59.370	1.3	2	718	1159.9	1642	749	1303.1	1833	821	8	
40	9	Sob	506	21.29570	-14.12	21.2954	-14.48	0.98656	23.1603	-2.39	58.911	2.3	6	717	1159.9	1644	800	1349.6	1958	817	9	
41	10	Nie	507	21.33535	-14.13	21.3352	-14.28	0.98674	0.0510	3.52	58.555	3.3	13	715	1160.0	1646	810	1436.3	2123	813	10	
42	11	Pon	508	21.37501	-14.14	21.3750	-14.09	0.98691	0.5527	10.15	58.300	4.3	21	713	1160.0	1648	821	1524.4	2250	809	11	
43	12	Wto	509	21.41466	-14.14	21.4146	-13.49	0.98709	1.4760	16.11	58.137	5.3	31	711	1160.0	1650	834	1615.2	****	805	12	
44	13	Śro	510	21.45432	-14.14	21.4542	-13.29	0.98727	2.4342	21.16	58.057	6.3	42	709	1160.0	1652	852	1709.6	020	801	13	
45	14	Czw	511	21.49397	-14.12	21.4937	-13.09	0.98745	3.4256	25.08	58.051	0.3	54	707	1159.9	1654	917	1808.0	151	757	14	
46	15	Pią	512	21.53363	-14.10	21.5332	-12.48	0.98764	4.4509	27.27	58.118	1.3	65	705	1159.9	1656	954	1909.3	318	753	15	
47	16	Sob	513	21.57329	-14.07	21.5725	-12.28	0.98783	5.4850	28.00	58.262	2.3	75	703	1159.9	1658	1049	2011.7	432	749	16	
48	17	Nie	514	22.01294	-14.03	22.0118	-12.07	0.98803	6.5147	26.44	58.493	3.3	84	701	1159.8	1700	1203	2112.4	526	745	17	
49	18	Pon	515	22.05260	-13.59	22.0510	-11.46	0.98823	7.5202	23.49	58.818	4.3	92	659	1159.7	1702	1329	2209.3	603	741	18	
50	19	Wto	516	22.09225	-13.54	22.0902	-11.25	0.98844	8.4826	19.35	59.244	5.3	97	657	1159.6	1704	1457	2301.9	627	737	19	
51	20	Śro	517	22.13191	-13.48	22.1252	-11.03	0.98865	9.4053	14.23	59.763	6.3	99	654	1159.5	1705	1623	2350.2	643	733	20	
52	21	Czw	518	22.17156	-13.41	22.1642	-10.42	0.98887	10.2955	8.37	60.359	0.3	100	652	1159.4	1707	1745	*****	656	729	21	
53	22	Pią	519	22.21122	-13.34	22.2032	-10.20	0.98909	11.1627	2.36	61.002	1.3	98	650	1159.3	1709	1904	035.3	706	726	22	
54	23	Sob	520	22.25087	-13.26	22.2421	-9.58	0.98931	12.0132	-3.23	61.650	2.3	94	648	1159.2	1711	2020	118.2	716	722	23	
55	24	Nie	521	22.29053	-13.18	22.2809	-9.36	0.98954	12.4610	-9.07	62.257	3.3	89	646	1159.0	1713	2136	200.2	725	718	24	
56	25	Pon	522	22.33018	-13.09	22.3156	-9.14	0.98977	13.3115	-14.23	62.775	4.3	82	644	1158.9	1715	2252	242.2	736	714	25	
57	26	Wto	523	22.36584	-12.59	22.3543	-8.52	0.99001	14.1736	-19.02	63.159	5.3	74	641	1158.7	1717	****	325.3	748	710	26	
58	27	Śro	524	22.40549	-12.49	22.3930	-8.29	0.99025	15.0549	-22.53	63.374	6.3	65	639	1158.6	1719	007	410.3	804	706	27	
59	28	Czw	525	22.44515	-12.39	22.4316	-8.07	0.99050	15.5612	-25.46	63.394	7.3	56	637	1158.4	1721	122	457.5	827	702	28	
60	29	Pią	526	22.48481	-12.27	22.4701	-7.44	0.99075	16.4841	-27.31	63.210	0.4	47	635	1158.2	1723	232	547.2	858	658	29	

Fazy Księżyca [Dm, h.mm]: Nów 7, 4.44 1kw 14, 4.33 Pełn 21, 4.31 3kw 29, 3.18

LUTY 2008 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST (0^h UT) Dm	
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach		
1	5.31	18.29	7.38	17.39	5.54	13.37	11.42	5.30	5.59	13.33	18.36	8.42	8.43	19.45	7.56	17.19	4.37	13.31		
	20.961	-17.21	21.609	-11.48	18.721	-22.35	5.560	26.66	18.726	-22.94	10.621	10.64	23.201	-5.95	21.590	-14.65	18.017	-17.06	8.70580	1
3	5.28	18.32	7.24	17.24	5.56	13.41	11.35	5.22	5.53	13.27	18.28	8.34	8.35	19.38	7.48	17.12	4.29	13.23		
	21.097	-16.63	21.493	-11.56	18.898	-22.25	5.565	26.63	18.756	-22.91	10.613	10.70	23.207	-5.91	21.595	-14.63	18.021	-17.06	8.83722	3
5	5.25	18.36	7.09	17.05	5.58	13.44	11.28	5.15	5.46	13.21	18.19	8.26	8.27	19.30	7.40	17.04	4.21	13.15		
	21.232	-16.04	21.347	-11.89	19.076	-22.10	5.573	26.60	18.786	-22.88	10.604	10.75	23.213	-5.87	21.600	-14.61	18.025	-17.06	8.96864	5
7	5.22	18.39	6.55	16.45	5.59	13.49	11.21	5.07	5.40	13.16	18.10	8.18	8.20	19.23	7.32	16.57	4.14	13.08		
	21.365	-15.42	21.188	-12.42	19.253	-21.90	5.585	26.57	18.816	-22.85	10.595	10.81	23.220	-5.83	21.605	-14.58	18.029	-17.06	9.10006	7
9	5.19	18.43	6.41	16.24	6.00	13.53	11.14	5.00	5.34	13.10	18.01	8.10	8.12	19.16	7.25	16.50	4.06	13.00		
	21.498	-14.79	21.033	-13.07	19.429	-21.66	5.600	26.55	18.846	-22.82	10.585	10.87	23.226	-5.79	21.610	-14.56	18.033	-17.06	9.23148	9
11	5.16	18.46	6.29	16.04	6.01	13.58	11.08	4.53	5.27	13.04	17.53	8.01	8.04	19.08	7.17	16.42	3.58	12.53		
	21.631	-14.15	20.897	-13.77	19.605	-21.38	5.619	26.52	18.875	-22.78	10.576	10.93	23.233	-5.74	21.615	-14.53	18.036	-17.05	9.36290	11
13	5.12	18.49	6.19	15.45	6.01	14.03	11.01	4.46	5.21	12.58	17.44	7.53	7.57	19.01	7.09	16.35	3.51	12.45		
	21.762	-13.48	20.790	-14.45	19.780	-21.06	5.640	26.49	18.904	-22.75	10.566	11.00	23.239	-5.70	21.620	-14.51	18.040	-17.05	9.49432	13
15	5.09	18.53	6.11	15.29	6.01	14.08	10.55	4.40	5.15	12.52	17.35	7.45	7.49	18.54	7.02	16.27	3.43	12.37		
	21.892	-12.81	20.717	-15.08	19.954	-20.69	5.665	26.47	18.933	-22.71	10.556	11.06	23.246	-5.66	21.625	-14.48	18.043	-17.05	9.62574	15
17	5.05	18.56	6.04	15.16	6.01	14.13	10.49	4.33	5.08	12.46	17.26	7.37	7.41	18.47	6.54	16.20	3.35	12.30		
	22.022	-12.11	20.680	-15.62	20.128	-20.29	5.693	26.44	18.961	-22.68	10.546	11.12	23.253	-5.62	21.630	-14.46	18.046	-17.05	9.75716	17
19	5.01	19.00	5.59	15.05	6.00	14.18	10.43	4.27	5.02	12.40	17.17	7.29	7.33	18.40	6.46	16.12	3.28	12.22		
	22.150	-11.41	20.677	-16.06	20.300	-19.84	5.723	26.41	18.989	-22.64	10.536	11.18	23.259	-5.57	21.635	-14.44	18.050	-17.04	9.88858	19
21	4.57	19.04	5.55	14.57	5.60	14.24	10.38	4.21	4.55	12.34	17.09	7.21	7.26	18.32	6.38	16.05	3.20	12.14		
	22.278	-10.70	20.704	-16.40	20.472	-19.36	5.756	26.39	19.016	-22.61	10.526	11.24	23.266	-5.53	21.640	-14.41	18.053	-17.04	10.02000	21
23	4.53	19.07	5.51	14.51	5.58	14.30	10.32	4.15	4.49	12.28	16.60	7.13	7.18	18.25	6.31	15.58	3.12	12.07		
	22.406	-9.97	20.759	-16.62	20.642	-18.83	5.791	26.36	19.043	-22.57	10.516	11.31	23.273	-5.49	21.645	-14.39	18.055	-17.04	10.15142	23
25	4.49	19.11	5.49	14.47	5.57	14.36	10.27	4.09	4.42	12.22	16.51	7.05	7.10	18.18	6.23	15.50	3.04	11.59		
	22.532	-9.23	20.837	-16.74	20.812	-18.28	5.829	26.33	19.069	-22.53	10.506	11.37	23.280	-5.44	21.650	-14.36	18.058	-17.03	10.28284	25
27	4.45	19.15	5.47	14.45	5.56	14.42	10.22	4.03	4.36	12.16	16.42	6.57	7.03	18.11	6.15	15.43	2.57	11.51		
	22.658	-8.49	20.934	-16.76	20.980	-17.68	5.869	26.30	19.095	-22.50	10.496	11.43	23.287	-5.40	21.654	-14.34	18.061	-17.03	10.41425	27
29	4.40	19.18	5.45	14.44	5.54	14.48	10.17	3.58	4.29	12.10	16.33	6.49	6.55	18.03	6.08	15.35	2.49	11.44		
	22.784	-7.73	21.048	-16.67	21.147	-17.06	5.911	26.27	19.121	-22.46	10.486	11.49	23.294	-5.35	21.659	-14.32	18.063	-17.03	10.54567	29

MARZEC 2008

Piwnice, CA UMK				← Dane na godz. 12 czasu strefowego (= 11 lub 10 ^h UT) →										Czas strefowy [hhmm.]								
..... Dzień				ST	Δα	α _☉	δ _☉	R _☉	α _☾	δ _☾	R _☾	Faza ☾	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ _☉	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
2454																						
61	1	Sob	527	22.52446	-12.16	22.5046	-7.21	0.99100	17.4246	-28.01	62.828	1.4	37	632	1158.0	1725	334	638.8	944	654	1	
62	2	Nie	528	22.56412	-12.04	22.5430	-6.58	0.99125	18.3732	-27.10	62.268	2.4	28	630	1157.8	1726	422	731.4	1044	650	2	
63	3	Pon	529	23.00377	-11.51	22.5814	-6.35	0.99150	19.3202	-24.58	61.570	3.4	20	628	1157.6	1728	458	823.9	1157	646	3	
64	4	Wto	530	23.04343	-11.38	23.0158	-6.12	0.99176	20.2529	-21.28	60.784	4.4	12	625	1157.4	1730	523	915.4	1318	642	4	
65	5	Śro	531	23.08309	-11.25	23.0541	-5.49	0.99201	21.1731	-16.50	59.970	5.4	6	623	1157.2	1732	541	1005.3	1442	638	5	
66	6	Czw	532	23.12274	-11.11	23.0924	-5.25	0.99227	22.0816	-11.15	59.192	6.4	2	621	1156.9	1734	555	1053.7	1607	634	6	
67	7	Pią	533	23.16240	-10.57	23.1306	-5.02	0.99253	22.5816	-4.60	58.511	7.4	0	619	1156.7	1736	607	1141.3	1733	630	7	
68	8	Sob	534	23.20205	-10.42	23.1648	-4.39	0.99279	23.4822	1.38	57.976	0.7	1	616	1156.4	1738	618	1229.0	1900	627	8	
69	9	Nie	535	23.24170	-10.27	23.2029	-4.15	0.99305	0.3933	8.16	57.618	1.7	4	614	1156.2	1740	629	1317.9	2029	623	9	
70	10	Pon	536	23.28136	-10.11	23.2411	-3.52	0.99331	1.3251	14.32	57.448	2.7	10	611	1155.9	1741	642	1409.2	2201	619	10	
71	11	Wto	537	23.32101	-9.56	23.2751	-3.28	0.99357	2.2906	20.01	57.456	3.7	18	609	1155.7	1743	658	1503.9	2334	615	11	
72	12	Śro	538	23.36067	-9.40	23.3132	-3.04	0.99383	3.2839	24.18	57.617	4.7	28	607	1155.4	1745	721	1602.2	****	611	12	
73	13	Czw	539	23.40033	-9.23	23.3512	-2.41	0.99410	4.3058	27.02	57.898	5.7	39	604	1155.1	1747	754	1703.5	105	607	13	
74	14	Pią	540	23.43598	-9.07	23.3852	-2.17	0.99436	5.3433	27.59	58.264	0.0	50	602	1154.9	1749	844	1805.7	224	603	14	
75	15	Sob	541	23.47564	-8.50	23.4232	-1.53	0.99463	6.3721	27.08	58.688	1.0	61	600	1154.6	1751	952	1906.4	324	559	15	
76	16	Nie	542	23.51530	-8.33	23.4611	-1.30	0.99490	7.3726	24.38	59.149	2.0	72	557	1154.3	1752	1114	2003.6	405	555	16	
77	17	Pon	543	23.55495	-8.16	23.4951	-1.06	0.99517	8.3344	20.47	59.635	3.0	81	555	1154.0	1754	1240	2056.4	432	551	17	
78	18	Wto	544	23.59460	-7.58	23.5330	-0.42	0.99544	9.2607	15.56	60.139	4.0	89	552	1153.7	1756	1405	2145.1	450	547	18	
79	19	Śro	545	0.03426	-7.40	23.5708	-0.19	0.99572	10.1508	10.25	60.658	5.0	94	550	1153.4	1758	1527	2230.3	504	543	19	
80	20	Czw	546	0.07391	-7.22	0.0047	0.05	0.99600	11.0140	4.33	61.185	6.0	98	548	1153.1	1800	1645	2313.4	515	539	20	
81	21	Pią	547	0.11357	-7.05	0.0426	0.29	0.99628	11.4642	-1.24	61.712	7.0	100	545	1152.8	1801	1801	2355.3	524	535	21	
82	22	Sob	548	0.15322	-6.46	0.0804	0.52	0.99656	12.3113	-7.11	62.219	0.7	100	543	1152.5	1803	1917	*****	534	532	22	
83	23	Nie	549	0.19288	-6.28	0.1143	1.16	0.99684	13.1606	-12.37	62.682	1.7	97	540	1152.2	1805	2032	037.2	544	528	23	
84	24	Pon	550	0.23253	-6.10	0.1521	1.40	0.99713	14.0208	-17.30	63.072	2.7	93	538	1151.9	1807	2148	119.9	555	524	24	
85	25	Wto	551	0.27219	-5.52	0.1859	2.03	0.99742	14.4953	-21.38	63.355	3.7	88	536	1151.6	1809	2304	204.2	610	520	25	
86	26	Śro	552	0.31184	-5.34	0.2238	2.27	0.99771	15.3940	-24.50	63.500	4.7	81	533	1151.3	1810	****	250.7	630	516	26	
87	27	Czw	553	0.35150	-5.15	0.2616	2.50	0.99800	16.3125	-26.58	63.479	5.7	73	531	1151.0	1812	016	339.4	658	512	27	
88	28	Pią	554	0.39116	-4.57	0.2954	3.14	0.99829	17.2439	-27.52	63.272	6.7	64	528	1150.7	1814	121	430.0	737	508	28	
89	29	Sob	555	0.43081	-4.39	0.3333	3.37	0.99859	18.1837	-27.29	62.874	7.7	54	526	1150.4	1816	215	521.7	831	504	29	
90	30	Nie	556	0.47047	-4.21	0.3711	4.00	0.99888	19.1223	-25.47	62.291	0.5	45	524	1150.1	1818	255	613.4	937	500	30	
90	30	Nie	556	23.46548	-4.22	0.3702	3.59	0.99887	19.1009	-25.53	62.319	0.5	45	624	1250.1	1918	355	713.4	1037	600	30	
91	31	Pon	557	23.50514	-4.04	0.4041	4.23	0.99916	20.0304	-22.58	61.582	1.5	35	621	1249.8	1919	424	804.3	1154	556	31	

Fazy Księżyca [Dm, h.mm]: Nów 7, 18.14 1kw 14, 11.46 Pełn 21, 19.40 3kw 29, 22.47 3kw 29, 23.47

MARZEC 2008 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.38	19.20	5.45	14.45	5.53	14.51	10.14	3.55	4.26	12.07	16.29	6.44	6.51	17.60	6.04	15.32	2.45	11.40		
	22.846	-7.35	21.110	-16.59	21.230	-16.73	5.932	26.26	19.134	-22.44	10.481	11.52	23.297	-5.33	21.662	-14.31	18.064	-17.03	10.61139	1
3	4.33	19.24	5.43	14.46	5.51	14.57	10.09	3.49	4.19	12.01	16.20	6.36	6.43	17.53	5.56	15.24	2.37	11.32		
	22.971	-6.58	21.245	-16.35	21.396	-16.05	5.978	26.22	19.159	-22.40	10.471	11.58	23.305	-5.29	21.666	-14.28	18.067	-17.02	10.74281	3
5	4.29	19.28	5.42	14.49	5.48	15.04	10.05	3.44	4.12	11.55	16.11	6.28	6.36	17.45	5.48	15.17	2.30	11.24		
	23.095	-5.81	21.390	-16.01	21.560	-15.35	6.025	26.18	19.183	-22.36	10.461	11.64	23.312	-5.24	21.671	-14.26	18.069	-17.02	10.87423	5
7	4.24	19.32	5.41	14.53	5.46	15.10	9.60	3.39	4.06	11.49	16.02	6.20	6.28	17.38	5.41	15.09	2.22	11.17		
	23.218	-5.04	21.544	-15.58	21.723	-14.62	6.074	26.14	19.207	-22.33	10.451	11.70	23.319	-5.20	21.676	-14.24	18.071	-17.02	11.00564	7
9	4.19	19.36	5.39	14.58	5.43	15.16	9.56	3.34	3.59	11.43	15.54	6.12	6.20	17.31	5.33	15.02	2.14	11.09		
	23.341	-4.25	21.706	-15.06	21.885	-13.86	6.124	26.10	19.230	-22.29	10.441	11.75	23.326	-5.15	21.680	-14.21	18.073	-17.01	11.13706	9
11	4.14	19.40	5.38	15.04	5.40	15.23	9.51	3.28	3.52	11.36	15.45	6.04	6.13	17.24	5.25	14.54	2.06	11.01		
	23.464	-3.47	21.875	-14.44	22.046	-13.07	6.177	26.05	19.253	-22.25	10.432	11.81	23.333	-5.11	21.685	-14.19	18.074	-17.01	11.26847	11
13	4.09	19.44	5.36	15.11	5.37	15.29	9.47	3.23	3.45	11.30	15.36	5.56	6.05	17.17	5.17	14.47	1.58	10.53		
	23.587	-2.68	22.050	-13.74	22.206	-12.26	6.230	26.00	19.275	-22.21	10.422	11.86	23.340	-5.06	21.689	-14.17	18.076	-17.01	11.39989	13
15	4.03	19.48	5.35	15.18	5.34	15.35	9.43	3.18	3.38	11.24	15.27	5.48	5.57	17.09	5.10	14.39	1.51	10.46		
	23.709	-1.89	22.229	-12.95	22.364	-11.43	6.286	25.95	19.297	-22.18	10.413	11.92	23.347	-5.02	21.693	-14.15	18.077	-17.00	11.53132	15
17	3.58	19.52	5.33	15.27	5.31	15.42	9.39	3.13	3.32	11.17	15.19	5.40	5.50	17.02	5.02	14.32	1.43	10.38		
	23.831	-1.10	22.413	-12.08	22.522	-10.58	6.343	25.89	19.318	-22.14	10.404	11.97	23.354	-4.97	21.698	-14.13	18.079	-17.00	11.66274	17
19	3.53	19.57	5.31	15.36	5.27	15.48	9.35	3.08	3.25	11.11	15.10	5.31	5.42	16.55	4.54	14.24	1.35	10.30		
	23.952	-0.31	22.602	-11.12	22.678	-9.70	6.401	25.83	19.338	-22.11	10.396	12.02	23.361	-4.93	21.702	-14.11	18.080	-16.99	11.79416	19
21	3.47	20.01	5.28	15.45	5.24	15.55	9.31	3.03	3.18	11.05	15.01	5.23	5.34	16.48	4.46	14.17	1.27	10.22		
	0.074	0.48	22.794	-10.08	22.834	-8.81	6.460	25.76	19.358	-22.07	10.387	12.07	23.368	-4.88	21.706	-14.09	18.081	-16.99	11.92557	21
23	3.42	20.05	5.26	15.55	5.20	16.01	9.28	2.59	3.11	10.58	14.53	5.15	5.27	16.41	4.39	14.09	1.19	10.14		
	0.195	1.27	22.990	-8.95	22.989	-7.91	6.521	25.68	19.377	-22.04	10.379	12.11	23.375	-4.84	21.710	-14.07	18.081	-16.99	12.05699	23
25	3.36	20.10	5.23	16.06	5.17	16.07	9.24	2.54	3.04	10.52	14.44	5.07	5.19	16.33	4.31	14.02	1.12	10.07		
	0.316	2.06	23.189	-7.75	23.143	-6.99	6.582	25.60	19.396	-22.00	10.371	12.16	23.382	-4.80	21.714	-14.05	18.082	-16.98	12.18840	25
27	3.30	20.15	5.21	16.17	5.13	16.14	9.21	2.49	2.57	10.45	14.36	4.59	5.11	16.26	4.23	13.54	1.04	9.59		
	0.438	2.84	23.393	-6.47	23.297	-6.06	6.645	25.51	19.413	-21.97	10.363	12.20	23.388	-4.75	21.718	-14.03	18.083	-16.98	12.31982	27
29	3.24	20.19	5.18	16.29	5.09	16.20	9.18	2.44	2.50	10.38	14.27	4.51	5.04	16.19	4.15	13.47	0.56	9.51		
	0.559	3.62	23.600	-5.11	23.450	-5.11	6.709	25.42	19.431	-21.94	10.356	12.24	23.395	-4.71	21.722	-14.01	18.083	-16.98	12.45125	29
31	4.18	21.24	6.15	17.41	6.05	17.26	10.15	3.39	3.43	11.32	15.19	5.43	5.56	17.12	5.08	14.39	1.48	10.43		
	0.678	4.38	23.807	-3.72	23.599	-4.18	6.772	25.32	19.447	-21.91	10.349	12.27	23.402	-4.67	21.725	-13.99	18.083	-16.97	12.58267	31

KWIECIEŃ 2008

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)											Czas strefowy [hhmm.]							
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2454																					
92	1	Wto	558	23.54479	-3.46	0.4420	4.46	0.99946	20.5444	-18.54	60.723	2.5	26	619	1249.5	1921	444	853.9	1315	552	1
93	2	Śro	559	23.58445	-3.29	0.4759	5.09	0.99975	21.4513	-13.48	59.798	3.5	17	617	1249.2	1923	500	942.1	1438	548	2
94	3	Czw	560	0.02410	-3.11	0.5138	5.32	1.00004	22.3501	-7.55	58.877	4.5	10	614	1248.9	1925	513	1029.5	1602	544	3
95	4	Pią	561	0.06376	-2.54	0.5517	5.55	1.00033	23.2457	-1.27	58.034	5.5	4	612	1248.6	1927	524	1117.0	1728	540	4
96	5	Sob	562	0.10341	-2.36	0.5856	6.18	1.00062	0.1600	5.15	57.343	6.5	1	609	1248.4	1928	535	1205.7	1857	536	5
97	6	Nie	563	0.14307	-2.19	1.0236	6.40	1.00091	1.0917	11.49	56.864	0.3	0	607	1248.1	1930	548	1256.8	2030	533	6
98	7	Pon	564	0.18272	-2.03	1.0615	7.03	1.00119	2.0545	17.48	56.633	1.3	2	605	1247.8	1932	603	1351.6	2205	529	7
99	8	Wto	565	0.22238	-1.46	1.0955	7.25	1.00147	3.0555	22.44	56.658	2.3	7	602	1247.5	1934	624	1450.5	2341	525	8
100	9	Śro	566	0.26203	-1.30	1.1336	7.48	1.00176	4.0925	26.08	56.919	3.3	15	600	1247.2	1936	654	1553.0	****	521	9
101	10	Czw	567	0.30169	-1.14	1.1716	8.10	1.00204	5.1441	27.43	57.374	4.3	24	558	1247.0	1937	739	1657.1	108	517	10
102	11	Pią	568	0.34135	-0.58	1.2057	8.32	1.00231	6.1923	27.23	57.967	5.3	35	555	1246.7	1939	843	1700.0	217	513	11
103	12	Sob	569	0.38100	-0.42	1.2438	8.54	1.00259	7.2115	25.17	58.642	6.3	46	553	1246.5	1941	1002	1859.2	305	509	12
104	13	Nie	570	0.42066	-0.27	1.2819	9.15	1.00287	8.1856	21.45	59.348	0.6	57	551	1246.2	1943	1128	1953.6	336	505	13
105	14	Pon	571	0.46031	-0.12	1.3201	9.37	1.00314	9.1212	17.10	60.044	1.6	67	549	1246.0	1945	1253	2043.1	357	501	14
106	15	Wto	572	0.49597	0.02	1.3543	9.58	1.00342	10.0139	11.52	60.706	2.6	77	546	1245.7	1946	1415	2128.8	412	457	15
107	16	Śro	573	0.53562	0.17	1.3925	10.20	1.00369	10.4814	6.11	61.317	3.6	85	544	1245.5	1948	1533	2211.9	423	453	16
108	17	Czw	574	0.57528	0.30	1.4308	10.41	1.00397	11.3304	0.21	61.869	4.6	91	542	1245.2	1950	1648	2253.5	433	449	17
109	18	Pią	575	1.01493	0.44	1.4651	11.02	1.00424	12.1710	-5.25	62.359	5.6	96	539	1245.0	1952	1803	2334.8	443	445	18
110	19	Sob	576	1.05459	0.57	1.5034	11.22	1.00452	13.0130	-10.54	62.783	6.6	99	537	1244.8	1954	1918	*****	453	441	19
111	20	Nie	577	1.09424	1.10	1.5418	11.43	1.00479	13.4653	-15.55	63.137	7.6	100	535	1244.6	1955	2033	016.8	504	437	20
112	21	Pon	578	1.13390	1.22	1.5803	12.03	1.00507	14.3358	-20.16	63.409	1.0	99	533	1244.4	1957	2148	100.4	517	434	21
113	22	Wto	579	1.17355	1.34	2.0147	12.24	1.00534	15.2305	-23.46	63.584	2.0	96	531	1244.2	1959	2302	146.0	535	430	22
114	23	Śro	580	1.21321	1.45	2.0533	12.43	1.00561	16.1414	-26.14	63.646	3.0	92	529	1244.0	2001	****	234.0	600	426	23
115	24	Czw	581	1.25287	1.56	2.0918	13.03	1.00589	17.0658	-27.31	63.573	4.0	86	526	1243.8	2002	009	323.9	635	422	24
116	25	Pią	582	1.29252	2.06	2.1304	13.23	1.00616	18.0027	-27.33	63.348	5.0	79	524	1243.6	2004	107	415.1	724	418	25
117	26	Sob	583	1.33218	2.16	2.1651	13.42	1.00643	18.5346	-26.18	62.958	6.0	71	522	1243.5	2006	151	506.4	825	414	26
118	27	Nie	584	1.37183	2.26	2.2038	14.01	1.00670	19.4607	-23.48	62.400	7.0	62	520	1243.3	2008	224	556.8	937	410	27
119	28	Pon	585	1.41149	2.34	2.2426	14.20	1.00696	20.3704	-20.11	61.683	8.0	52	518	1243.2	2010	247	645.7	1054	406	28
120	29	Wto	586	1.45115	2.43	2.2814	14.39	1.00723	21.2639	-15.33	60.831	0.8	42	516	1243.0	2011	304	733.1	1214	402	29
121	30	Śro	587	1.49080	2.50	2.3203	14.57	1.00749	22.1521	-10.07	59.887	1.8	32	514	1242.9	2013	318	819.4	1336	358	30

Fazy Księżyca [Dm, h.mm]: Nów 6, 5.55 1kw 12, 20.32 Pełn 20, 12.25 3kw 28, 16.12

KWIECIEŃ 2008 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

	SŁOŃCE			MERCURY			WENUS			MARS			JOWISZ			SATURN			URAN			NEPTUN			PLUTON			ST	
Dm	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	Dm			
1	4.15	21.27	6.14	17.47	6.03	17.29	10.13	3.37	3.39	11.28	15.14	5.39	5.52	17.08	5.04	14.36	1.44	10.39											
	0.739	4.76	23.914	-2.98	23.675	-3.70	6.804	25.27	19.455	-21.90	10.346	12.29	23.405	-4.65	21.727	-13.98	18.083	-16.97	12.64838	1									
3	4.09	21.31	6.11	18.01	5.59	17.36	10.10	3.32	3.32	11.22	15.06	5.31	5.44	17.01	4.56	14.28	1.36	10.31											
	0.860	5.53	0.132	-1.44	23.827	-2.74	6.870	25.16	19.470	-21.87	10.339	12.33	23.412	-4.61	21.731	-13.97	18.083	-16.97	12.77979	3									
5	4.03	21.37	6.08	18.15	5.55	17.42	10.07	3.27	3.25	11.15	14.57	5.23	5.37	16.54	4.48	14.20	1.28	10.24											
	0.982	6.29	0.354	0.15	23.978	-1.77	6.937	25.05	19.485	-21.84	10.333	12.36	23.418	-4.56	21.734	-13.95	18.083	-16.96	12.91121	5									
7	3.57	21.42	6.05	18.29	5.51	17.48	10.04	3.22	3.17	11.08	14.49	5.15	5.29	16.46	4.41	14.13	1.20	10.16											
	1.104	7.05	0.582	1.81	0.130	-0.79	7.005	24.92	19.499	-21.81	10.327	12.39	23.425	-4.52	21.738	-13.93	18.083	-16.96	13.04263	7									
9	3.51	21.47	6.01	18.45	5.47	17.55	10.02	3.17	3.10	11.01	14.41	5.07	5.21	16.39	4.33	14.05	1.12	10.08											
	1.227	7.79	0.816	3.52	0.281	0.19	7.073	24.79	19.512	-21.79	10.322	12.42	23.431	-4.48	21.741	-13.92	18.082	-16.96	13.17405	9									
11	3.44	21.53	5.58	19.01	5.43	18.01	9.59	3.12	3.03	10.54	14.32	4.59	5.14	16.32	4.25	13.58	1.04	10.00											
	1.349	8.53	1.055	5.28	0.432	1.16	7.142	24.66	19.524	-21.77	10.317	12.44	23.437	-4.44	21.744	-13.90	18.082	-16.95	13.30547	11									
13	3.37	21.58	5.56	19.17	5.39	18.08	9.57	3.07	2.56	10.47	14.24	4.51	5.06	16.25	4.17	13.50	0.57	9.52											
	1.472	9.26	1.301	7.07	0.583	2.14	7.211	24.51	19.536	-21.74	10.312	12.47	23.444	-4.40	21.747	-13.89	18.081	-16.95	13.43689	13									
15	3.31	22.04	5.53	19.34	5.35	18.14	9.54	3.02	2.48	10.40	14.16	4.43	4.58	16.17	4.09	13.43	0.49	9.44											
	1.595	9.97	1.553	8.89	0.734	3.12	7.282	24.36	19.547	-21.72	10.308	12.49	23.450	-4.37	21.750	-13.87	18.080	-16.95	13.56831	15									
17	3.24	22.10	5.50	19.52	5.31	18.20	9.52	2.57	2.41	10.33	14.08	4.35	4.50	16.10	4.02	13.35	0.41	9.36											
	1.719	10.68	1.810	10.70	0.885	4.09	7.352	24.20	19.557	-21.71	10.304	12.50	23.456	-4.33	21.752	-13.86	18.079	-16.94	13.69973	17									
19	3.17	22.17	5.47	20.10	5.27	18.27	9.50	2.53	2.33	10.26	13.60	4.27	4.43	16.03	3.54	13.27	0.33	9.28											
	1.843	11.37	2.073	12.50	1.037	5.06	7.424	24.03	19.566	-21.69	10.301	12.52	23.462	-4.29	21.755	-13.85	18.078	-16.94	13.83114	19									
21	3.10	22.23	5.45	20.29	5.23	18.33	9.47	2.48	2.26	10.19	13.51	4.19	4.35	15.55	3.46	13.20	0.25	9.20											
	1.967	12.06	2.339	14.25	1.189	6.02	7.495	23.86	19.574	-21.68	10.298	12.53	23.467	-4.25	21.758	-13.84	18.077	-16.94	13.96256	21									
23	3.02	22.30	5.43	20.48	5.19	18.40	9.45	2.43	2.18	10.11	13.43	4.11	4.27	15.48	3.38	13.12	0.17	9.13											
	2.092	12.72	2.607	15.93	1.341	6.97	7.567	23.67	19.582	-21.66	10.295	12.54	23.473	-4.22	21.760	-13.82	18.075	-16.94	14.09398	23									
25	2.55	22.37	5.41	21.06	5.15	18.46	9.43	2.37	2.11	10.04	13.35	4.03	4.20	15.41	3.31	13.04	0.09	9.05											
	2.218	13.38	2.875	17.52	1.494	7.91	7.640	23.48	19.589	-21.65	10.293	12.55	23.479	-4.18	21.762	-13.81	18.074	-16.93	14.22540	25									
27	2.47	22.44	5.39	21.24	5.11	18.53	9.41	2.32	2.03	9.56	13.27	3.55	4.12	15.33	3.23	12.57	23.57	8.57											
	2.344	14.02	3.141	18.97	1.648	8.84	7.713	23.28	19.595	-21.64	10.292	12.55	23.484	-4.15	21.764	-13.80	18.072	-16.93	14.35682	27									
29	2.39	22.52	5.38	21.40	5.08	18.59	9.40	2.27	1.56	9.49	13.19	3.47	4.04	15.26	3.15	12.49	23.49	8.49											
	2.471	14.64	3.400	20.28	1.803	9.76	7.786	23.07	19.599	-21.63	10.291	12.56	23.489	-4.12	21.766	-13.79	18.070	-16.93	14.48824	29									

MAJ 2008

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2454																					
122	1	Czw	588	1.53046	2.58	2.3552	15.15	1.00775	23.0357	-4.02	58.909	2.8	22	512	1242.8	2015	330	905.5	1458	354	1
123	2	Pią	589	1.57011	3.04	2.3942	15.33	1.00801	23.5331	2.27	57.971	3.8	13	510	1242.7	2017	341	952.4	1624	350	2
124	3	Sob	590	2.00577	3.10	2.4333	15.51	1.00826	0.4513	9.01	57.153	4.8	6	508	1242.6	2018	352	1041.6	1753	346	3
125	4	Nie	591	2.04542	3.16	2.4724	16.08	1.00851	1.4014	15.16	56.533	5.8	2	506	1242.5	2020	406	1134.5	1927	342	4
126	5	Pon	592	2.08508	3.21	2.5115	16.25	1.00875	2.3929	20.43	56.172	6.8	0	504	1242.4	2022	424	1232.0	2105	339	5
127	6	Wto	593	2.12473	3.25	2.5508	16.42	1.00900	3.4303	24.50	56.105	0.9	1	502	1242.3	2024	450	1334.4	2239	335	6
128	7	Śro	594	2.16439	3.29	2.5900	16.58	1.00923	4.4945	27.11	56.332	1.9	6	500	1242.3	2025	529	1440.2	****	331	7
129	8	Czw	595	2.20404	3.32	3.0254	17.15	1.00947	5.5705	27.31	56.821	2.9	12	459	1242.2	2027	627	1546.3	000	327	8
130	9	Pią	596	2.24370	3.35	3.0647	17.31	1.00969	7.0209	25.53	57.513	3.9	21	457	1242.2	2029	744	1649.4	058	323	9
131	10	Sob	597	2.28336	3.37	3.1042	17.46	1.00992	8.0253	22.38	58.336	4.9	31	455	1242.1	2030	911	1747.3	136	319	10
132	11	Nie	598	2.32301	3.39	3.1437	18.02	1.01014	8.5834	18.11	59.218	5.9	42	453	1242.1	2032	1039	1839.6	201	315	11
133	12	Pon	599	2.36267	3.40	3.1832	18.17	1.01036	9.4941	12.58	60.096	0.3	53	452	1242.1	2034	1203	1927.2	218	311	12
134	13	Wto	600	2.40232	3.40	3.2228	18.32	1.01058	10.3716	7.19	60.918	1.3	63	450	1242.1	2035	1323	2011.2	231	307	13
135	14	Śro	601	2.44198	3.40	3.2625	18.46	1.01079	11.2230	1.31	61.653	2.3	73	448	1242.1	2037	1439	2053.1	242	303	14
136	15	Czw	602	2.48163	3.40	3.3022	19.00	1.01100	12.0634	-4.14	62.279	3.3	81	447	1242.1	2039	1553	2134.2	251	259	15
137	16	Pią	603	2.52129	3.39	3.3420	19.14	1.01121	12.5034	-9.43	62.789	4.3	88	445	1242.1	2040	1707	2215.7	301	255	16
138	17	Sob	604	2.56094	3.37	3.3818	19.28	1.01141	13.3524	-14.47	63.184	5.3	94	444	1242.1	2042	1821	2258.5	312	251	17
139	18	Nie	605	3.00060	3.35	3.4217	19.41	1.01161	14.2149	-19.15	63.468	6.3	97	442	1242.2	2043	1936	2343.2	325	247	18
140	19	Pon	606	3.04026	3.32	3.4616	19.53	1.01181	15.1018	-22.56	63.644	7.3	100	441	1242.2	2045	2050	*****	341	243	19
141	20	Wto	607	3.07591	3.29	3.5016	20.06	1.01201	16.0056	-25.37	63.716	0.3	100	439	1242.3	2046	2200	030.4	404	240	20
142	21	Śro	608	3.11557	3.25	3.5416	20.18	1.01221	16.5321	-27.11	63.682	1.3	98	438	1242.3	2048	2300	119.8	436	236	21
143	22	Czw	609	3.15522	3.20	3.5817	20.30	1.01240	17.4645	-27.30	63.538	2.3	95	437	1242.4	2049	2349	210.6	520	232	22
144	23	Pią	610	3.19488	3.15	4.0219	20.41	1.01260	18.4006	-26.33	63.274	3.3	90	435	1242.5	2051	****	302.0	618	228	23
145	24	Sob	611	3.23454	3.10	4.0621	20.52	1.01279	19.3227	-24.21	62.883	4.3	84	434	1242.6	2052	025	352.5	726	224	24
146	25	Nie	612	3.27419	3.04	4.1023	21.03	1.01297	20.2313	-21.01	62.360	5.3	76	433	1242.7	2054	050	441.5	842	220	25
147	26	Pon	613	3.31385	2.58	4.1426	21.14	1.01316	21.1218	-16.43	61.705	6.3	67	432	1242.8	2055	109	528.6	959	216	26
148	27	Wto	614	3.35350	2.51	4.1830	21.24	1.01333	22.0005	-11.37	60.930	7.3	57	430	1242.9	2056	124	614.1	1118	212	27
149	28	Śro	615	3.39316	2.43	4.2234	21.33	1.01351	22.4718	-5.53	60.059	0.3	47	429	1243.0	2057	136	658.8	1237	208	28
150	29	Czw	616	3.43281	2.35	4.2638	21.42	1.01368	23.3457	0.17	59.135	1.3	36	428	1243.2	2059	146	743.7	1359	204	29
151	30	Pią	617	3.47247	2.27	4.3043	21.51	1.01385	0.2414	6.37	58.215	2.3	26	427	1243.3	2100	157	830.1	1523	200	30
152	31	Sob	618	3.51213	2.18	4.3449	21.60	1.01401	1.1626	12.51	57.370	3.3	16	426	1243.4	2101	210	919.6	1652	156	31

Fazy Księżyca [Dm, h.mm]: Nów 5, 14.18 1kw 12, 5.47 Pełn 20, 4.11 3kw 28, 4.56

MAJ 2008 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	2.30	23.00	5.37	21.56	5.04	19.06	9.38	2.22	1.48	9.41	13.12	3.39	3.56	15.19	3.07	12.41	23.41	8.41		
	2.598	15.25	3.652	21.44	1.958	10.66	7.859	22.86	19.604	-21.63	10.290	12.56	23.495	-4.08	21.768	-13.79	18.068	-16.93	14.61966	1
3	2.21	23.09	5.36	22.10	5.00	19.12	9.36	2.17	1.40	9.34	13.04	3.31	3.49	15.11	2.59	12.34	23.33	8.33		
	2.726	15.84	3.892	22.43	2.114	11.55	7.933	22.63	19.607	-21.63	10.290	12.55	23.500	-4.05	21.770	-13.78	18.066	-16.93	14.75108	3
5	2.12	23.18	5.35	22.22	4.57	19.19	9.34	2.12	1.33	9.26	12.56	3.23	3.41	15.04	2.52	12.26	23.25	8.25		
	2.854	16.42	4.120	23.25	2.271	12.41	8.007	22.40	19.609	-21.63	10.290	12.55	23.504	-4.02	21.771	-13.77	18.064	-16.92	14.88250	5
7	2.02	23.29	5.35	22.32	4.53	19.26	9.33	2.07	1.25	9.18	12.48	3.16	3.33	14.56	2.44	12.18	23.17	8.17		
	2.983	16.97	4.334	23.91	2.429	13.26	8.082	22.16	19.611	-21.63	10.291	12.54	23.509	-3.99	21.773	-13.76	18.062	-16.92	15.01392	7
9	1.51	23.40	5.35	22.40	4.50	19.32	9.31	2.01	1.17	9.10	12.40	3.08	3.26	14.49	2.36	12.10	23.09	8.09		
	3.113	17.51	4.530	24.41	2.588	14.09	8.156	21.91	19.611	-21.63	10.292	12.53	23.514	-3.97	21.774	-13.76	18.060	-16.92	15.14534	9
11	1.38	23.55	5.35	22.46	4.47	19.39	9.30	1.56	1.09	9.02	12.33	2.60	3.18	14.41	2.28	12.03	23.01	8.01		
	3.244	18.03	4.710	24.77	2.748	14.90	8.231	21.66	19.611	-21.64	10.293	12.52	23.518	-3.94	21.775	-13.75	18.057	-16.92	15.27676	11
13	1.22	0.25	5.35	22.49	4.44	19.45	9.28	1.51	1.01	8.54	12.25	2.52	3.10	14.34	2.20	11.55	22.53	7.53		
	3.375	18.53	4.870	24.98	2.909	15.68	8.306	21.39	19.609	-21.64	10.295	12.50	23.522	-3.91	21.776	-13.75	18.054	-16.92	15.40818	13
15	*****	*****	5.34	22.51	4.41	19.52	9.27	1.45	0.53	8.46	12.17	2.44	3.02	14.26	2.12	11.47	22.45	7.45		
	3.506	19.00	5.009	25.07	3.072	16.43	8.381	21.12	19.607	-21.65	10.298	12.48	23.527	-3.89	21.777	-13.74	18.052	-16.92	15.53960	15
17	*****	*****	5.34	22.49	4.38	19.59	9.26	1.40	0.45	8.38	12.10	2.36	2.54	14.19	2.05	11.39	22.37	7.37		
	3.638	19.46	5.128	25.04	3.235	17.16	8.456	20.84	19.604	-21.66	10.301	12.46	23.531	-3.86	21.778	-13.74	18.049	-16.92	15.67102	17
19	*****	*****	5.33	22.46	4.36	20.05	9.24	1.35	0.37	8.30	12.02	2.29	2.47	14.11	1.57	11.31	22.29	7.29		
	3.771	19.89	5.225	24.90	3.400	17.86	8.531	20.55	19.600	-21.68	10.304	12.44	23.534	-3.84	21.778	-13.74	18.046	-16.92	15.80244	19
21	*****	*****	5.32	22.41	4.33	20.12	9.23	1.29	0.29	8.22	11.55	2.21	2.39	14.04	1.49	11.24	22.21	7.21		
	3.905	20.30	5.299	24.65	3.566	18.52	8.607	20.25	19.596	-21.69	10.308	12.41	23.538	-3.82	21.779	-13.74	18.043	-16.92	15.93386	21
23	*****	*****	5.30	22.33	4.31	20.18	9.22	1.24	0.21	8.13	11.47	2.13	2.31	13.56	1.41	11.16	22.13	7.13		
	4.039	20.69	5.350	24.32	3.734	19.16	8.682	19.95	19.590	-21.71	10.312	12.39	23.541	-3.80	21.779	-13.74	18.040	-16.92	16.06529	23
25	*****	*****	5.27	22.24	4.29	20.24	9.21	1.18	0.13	8.05	11.40	2.05	2.23	13.49	1.33	11.08	22.05	7.05		
	4.173	21.05	5.378	23.90	3.902	19.76	8.758	19.64	19.583	-21.73	10.316	12.36	23.545	-3.78	21.779	-13.74	18.037	-16.92	16.19671	25
27	*****	*****	5.23	22.12	4.28	20.31	9.19	1.13	0.05	7.57	11.33	1.58	2.16	13.41	1.25	10.60	21.57	6.57		
	4.308	21.39	5.383	23.41	4.072	20.32	8.833	19.32	19.576	-21.75	10.321	12.32	23.548	-3.76	21.779	-13.74	18.034	-16.92	16.32813	27
29	*****	*****	5.19	21.59	4.26	20.37	9.18	1.07	23.53	7.48	11.25	1.50	2.08	13.34	1.17	10.52	21.49	6.48		
	4.444	21.71	5.366	22.86	4.243	20.85	8.909	18.99	19.568	-21.78	10.327	12.29	23.551	-3.74	21.779	-13.74	18.031	-16.92	16.45955	29
31	*****	*****	5.13	21.44	4.25	20.43	9.17	1.01	23.45	7.39	11.18	1.42	2.00	13.26	1.10	10.44	21.41	6.40		
	4.580	22.00	5.330	22.26	4.415	21.34	8.984	18.66	19.559	-21.80	10.333	12.25	23.553	-3.72	21.779	-13.74	18.028	-16.92	16.59097	31

CZERWIEC 2008

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2454																					
153	1	Nie	619	3.55178	2.09	4.3855	22.08	1.01417	2.1246	18.32	56.676	4.3	9	426	1243.6	2102	225	1013.5	1826	152	1
154	2	Pon	620	3.59144	1.59	4.4301	22.16	1.01432	3.1357	23.12	56.206	5.3	3	425	1243.8	2103	247	1112.8	2002	148	2
155	3	Wto	621	4.03109	1.49	4.4707	22.23	1.01447	4.1938	26.20	56.015	6.3	0	424	1243.9	2105	318	1217.2	2131	144	3
156	4	Śro	622	4.07075	1.39	4.5114	22.30	1.01461	5.2753	27.31	56.127	0.6	1	423	1244.1	2106	407	1324.6	2242	141	4
157	5	Czw	623	4.11041	1.28	4.5521	22.37	1.01474	6.3539	26.38	56.532	1.6	4	423	1244.3	2107	517	1431.2	2330	137	5
158	6	Pią	624	4.15006	1.17	4.5929	22.43	1.01487	7.3959	23.52	57.188	2.6	10	422	1244.5	2108	643	1533.6	****	133	6
159	7	Sob	625	4.18572	1.06	5.0337	22.48	1.01500	8.3918	19.39	58.027	3.6	18	421	1244.6	2108	815	1630.2	002	129	7
160	8	Nie	626	4.22537	0.54	5.0745	22.54	1.01512	9.3327	14.28	58.970	4.6	27	421	1244.8	2109	944	1721.2	022	125	8
161	9	Pon	627	4.26503	0.43	5.1153	22.59	1.01523	10.2317	8.46	59.938	5.6	37	420	1245.0	2110	1107	1807.7	037	121	9
162	10	Wto	628	4.30469	0.31	5.1602	23.03	1.01534	11.1002	2.52	60.864	6.6	48	420	1245.2	2111	1226	1851.1	049	117	10
163	11	Śro	629	4.34434	0.18	5.2011	23.07	1.01544	11.5458	-2.59	61.695	0.8	58	420	1245.4	2112	1342	1933.0	059	113	11
164	12	Czw	630	4.38400	0.06	5.2419	23.11	1.01554	12.3916	-8.35	62.395	1.8	68	419	1245.6	2112	1456	2014.5	109	109	12
165	13	Pią	631	4.42365	-0.06	5.2828	23.15	1.01564	13.2360	-13.46	62.944	2.8	76	419	1245.9	2113	1611	2056.9	119	105	13
166	14	Sob	632	4.46331	-0.19	5.3238	23.17	1.01573	14.1000	-18.21	63.338	3.8	84	419	1246.1	2114	1725	2141.0	132	101	14
167	15	Nie	633	4.50296	-0.32	5.3647	23.20	1.01582	14.5755	-22.12	63.581	4.8	90	419	1246.3	2114	1839	2227.3	147	057	15
168	16	Pon	634	4.54262	-0.45	5.4056	23.22	1.01590	15.4800	-25.06	63.685	5.8	95	419	1246.5	2115	1951	2316.0	208	053	16
169	17	Wto	635	4.58228	-0.58	5.4506	23.24	1.01599	16.4004	-26.55	63.663	6.8	98	419	1246.7	2115	2054	*****	237	049	17
170	18	Śro	636	5.02193	-1.10	5.4915	23.25	1.01606	17.3325	-27.31	63.531	7.8	100	419	1246.9	2115	2147	006.6	317	046	18
171	19	Czw	637	5.06159	-1.23	5.5325	23.26	1.01614	18.2703	-26.49	63.299	0.7	100	419	1247.1	2116	2226	058.0	411	042	19
172	20	Pią	638	5.10124	-1.36	5.5734	23.26	1.01621	19.1954	-24.52	62.976	1.7	97	419	1247.4	2116	2254	149.2	517	038	20
173	21	Sob	639	5.14090	-1.49	6.0144	23.26	1.01628	20.1111	-21.45	62.564	2.7	93	419	1247.6	2116	2315	238.9	631	034	21
174	22	Nie	640	5.18056	-2.02	6.0553	23.26	1.01634	21.0035	-17.39	62.066	3.7	88	419	1247.8	2116	2330	326.6	749	030	22
175	23	Pon	641	5.22021	-2.15	6.1003	23.25	1.01641	21.4820	-12.43	61.483	4.7	80	420	1248.0	2116	2343	412.3	907	026	23
176	24	Wto	642	5.25587	-2.28	6.1412	23.24	1.01646	22.3501	-7.11	60.819	5.7	72	420	1248.2	2116	2354	456.6	1025	022	24
177	25	Śro	643	5.29552	-2.41	6.1821	23.22	1.01652	23.2132	-1.14	60.087	6.7	62	420	1248.4	2116	****	540.4	1143	018	25
178	26	Czw	644	5.33518	-2.53	6.2231	23.20	1.01656	0.0859	4.56	59.309	7.7	51	421	1248.6	2116	004	624.9	1304	014	26
179	27	Pią	645	5.37483	-3.06	6.2640	23.18	1.01661	0.5838	11.01	58.523	0.9	40	421	1248.8	2116	016	711.5	1428	010	27
180	28	Sob	646	5.41449	-3.18	6.3048	23.15	1.01665	1.5143	16.44	57.777	1.9	29	422	1249.0	2116	029	801.6	1557	006	28
181	29	Nie	647	5.45415	-3.30	6.3457	23.12	1.01668	2.4918	21.40	57.133	2.9	19	422	1249.3	2116	047	856.6	1730	002	29
182	30	Pon	648	5.49380	-3.42	6.3906	23.08	1.01671	3.5143	25.20	56.654	3.9	10	423	1249.4	2115	112	957.0	1901	2354	30

Fazy Księżyca [Dm, h.mm]: Nów 3, 21.23 1kw 10, 17.04 Pełn 18, 19.30 3kw 26, 14.10

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Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT) Dm	
1	*****	*****	5.10	21.37	4.25	20.46	9.17	0.59	23.41	7.35	11.14	1.38	1.56	13.22	1.06	10.40	21.36	6.36		
	4.648	22.13	5.306	21.94	4.502	21.57	9.022	18.49	19.554	-21.81	10.336	12.23	23.555	-3.72	21.779	-13.74	18.026	-16.92	16.65668	1
3	*****	*****	5.03	21.20	4.24	20.51	9.16	0.53	23.32	7.26	11.07	1.30	1.48	13.15	0.58	10.32	21.28	6.28		
	4.785	22.38	5.247	21.30	4.676	22.00	9.098	18.14	19.544	-21.84	10.342	12.19	23.557	-3.70	21.778	-13.75	18.023	-16.92	16.78810	3
5	*****	*****	4.56	21.04	4.24	20.57	9.15	0.47	23.24	7.18	10.60	1.23	1.41	13.07	0.50	10.24	21.20	6.20		
	4.923	22.61	5.178	20.66	4.851	22.39	9.174	17.79	19.533	-21.87	10.349	12.15	23.559	-3.69	21.778	-13.75	18.019	-16.92	16.91952	5
7	*****	*****	4.48	20.47	4.24	21.02	9.14	0.42	23.16	7.09	10.53	1.15	1.33	12.59	0.42	10.16	21.12	6.12		
	5.060	22.81	5.103	20.03	5.026	22.74	9.250	17.43	19.521	-21.90	10.356	12.10	23.561	-3.68	21.777	-13.75	18.016	-16.93	17.05095	7
9	*****	*****	4.40	20.31	4.24	21.07	9.13	0.36	23.07	7.00	10.46	1.07	1.25	12.52	0.34	10.09	21.04	6.04		
	5.198	22.98	5.028	19.46	5.203	23.04	9.325	17.06	19.509	-21.93	10.364	12.06	23.563	-3.67	21.776	-13.76	18.012	-16.93	17.18237	9
11	*****	*****	4.31	20.15	4.25	21.12	9.12	0.30	22.59	6.51	10.38	0.60	1.17	12.44	0.26	10.01	20.56	5.56		
	5.336	23.12	4.958	18.95	5.380	23.30	9.401	16.69	19.496	-21.97	10.372	12.01	23.565	-3.66	21.775	-13.76	18.009	-16.93	17.31379	11
13	*****	*****	4.22	20.01	4.26	21.17	9.11	0.24	22.50	6.42	10.31	0.52	1.09	12.36	0.18	9.53	20.48	5.48		
	5.475	23.24	4.898	18.54	5.558	23.52	9.477	16.30	19.482	-22.00	10.380	11.96	23.566	-3.65	21.774	-13.77	18.005	-16.93	17.44520	13
15	*****	*****	4.14	19.48	4.27	21.21	9.10	0.19	22.42	6.33	10.24	0.44	1.02	12.28	0.10	9.45	20.40	5.40		
	5.613	23.33	4.851	18.23	5.737	23.68	9.552	15.92	19.468	-22.04	10.389	11.90	23.568	-3.64	21.773	-13.78	18.002	-16.93	17.57662	15
17	*****	*****	4.05	19.37	4.29	21.25	9.09	0.13	22.33	6.24	10.17	0.37	0.54	12.21	0.03	9.37	20.32	5.32		
	5.752	23.40	4.820	18.04	5.915	23.81	9.628	15.52	19.453	-22.07	10.398	11.85	23.569	-3.64	21.771	-13.79	17.998	-16.94	17.70805	17
19	*****	*****	3.57	19.28	4.31	21.28	9.08	0.07	22.25	6.15	10.10	0.29	0.46	12.13	23.51	9.29	20.24	5.24		
	5.890	23.43	4.808	17.98	6.094	23.88	9.704	15.12	19.438	-22.11	10.407	11.79	23.569	-3.63	21.770	-13.79	17.995	-16.94	17.83947	19
21	*****	*****	3.50	19.21	4.34	21.31	9.08	23.57	22.16	6.06	10.03	0.21	0.38	12.05	23.43	9.21	20.16	5.15		
	6.029	23.44	4.817	18.03	6.274	23.91	9.779	14.72	19.422	-22.15	10.417	11.73	23.570	-3.63	21.768	-13.80	17.991	-16.94	17.97090	21
23	*****	*****	3.42	19.16	4.37	21.34	9.07	23.51	22.08	5.57	9.57	0.14	0.30	11.57	23.35	9.13	20.08	5.07		
	6.167	23.42	4.846	18.19	6.453	23.89	9.855	14.30	19.405	-22.19	10.427	11.67	23.571	-3.63	21.766	-13.81	17.987	-16.95	18.10232	23
25	*****	*****	3.36	19.13	4.41	21.36	9.06	23.45	21.59	5.48	9.50	0.06	0.22	11.49	23.27	9.05	19.60	4.59		
	6.306	23.37	4.897	18.46	6.632	23.82	9.930	13.88	19.388	-22.22	10.437	11.61	23.571	-3.63	21.765	-13.82	17.984	-16.95	18.23374	25
27	*****	*****	3.30	19.12	4.44	21.38	9.05	23.40	21.51	5.39	9.43	23.55	0.14	11.41	23.19	8.56	19.52	4.51		
	6.444	23.30	4.969	18.81	6.811	23.71	10.006	13.46	19.371	-22.26	10.448	11.54	23.571	-3.63	21.763	-13.84	17.980	-16.96	18.36516	27
29	*****	*****	3.25	19.13	4.48	21.40	9.04	23.34	21.42	5.30	9.36	23.47	0.07	11.34	23.11	8.48	19.44	4.43		
	6.583	23.20	5.063	19.24	6.989	23.55	10.081	13.03	19.354	-22.30	10.458	11.48	23.571	-3.63	21.761	-13.85	17.977	-16.96	18.49658	29

LIPIEC 2008

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2454																		
183	1	Wto	649	5.53346	-3.54	6.4314	23.04	1.01673	4.5804	27.18	56.398	4.9	4	424	1249.6	2115	151	1102.0	2021	2350	1
184	2	Śro	650	5.57311	-4.05	6.4722	22.60	1.01674	6.0556	27.16	56.405	5.9	1	425	1249.8	2115	250	1208.8	2119	2347	2
185	3	Czw	651	6.01277	-4.16	6.5130	22.55	1.01675	7.1215	25.13	56.686	0.3	0	425	1250.0	2114	410	1313.9	2158	2343	3
186	4	Pią	652	6.05243	-4.27	6.5537	22.49	1.01675	8.1435	21.29	57.224	1.3	3	426	1250.2	2114	541	1414.4	2224	2339	4
187	5	Sob	653	6.09208	-4.38	6.5944	22.44	1.01675	9.1157	16.31	57.970	2.3	7	427	1250.4	2113	714	1509.3	2242	2335	5
188	6	Nie	654	6.13174	-4.48	7.0351	22.38	1.01674	10.0439	10.48	58.857	3.3	14	428	1250.5	2112	843	1559.1	2255	2331	6
189	7	Pon	655	6.17139	-4.58	7.0757	22.31	1.01673	10.5340	4.46	59.808	4.3	23	429	1250.7	2112	1006	1645.1	2306	2327	7
190	8	Wto	656	6.21105	-5.07	7.1203	22.24	1.01671	11.4013	-1.17	60.747	5.3	32	430	1250.9	2111	1125	1728.6	2316	2323	8
191	9	Śro	657	6.25071	-5.16	7.1608	22.17	1.01668	12.2534	-7.06	61.608	6.3	42	431	1251.0	2110	1241	1811.1	2327	2319	9
192	10	Czw	658	6.29036	-5.24	7.2013	22.10	1.01665	13.1047	-12.29	62.342	0.2	52	432	1251.2	2109	1357	1853.7	2338	2315	10
193	11	Pią	659	6.33002	-5.32	7.2418	22.02	1.01661	13.5651	-17.18	62.915	1.2	62	433	1251.3	2108	1512	1937.6	2353	2311	11
194	12	Sob	660	6.36567	-5.40	7.2822	21.53	1.01657	14.4428	-21.22	63.309	2.2	71	435	1251.4	2108	1627	2023.3	****	2307	12
195	13	Nie	661	6.40533	-5.47	7.3225	21.44	1.01653	15.3406	-24.32	63.522	3.2	79	436	1251.5	2107	1740	2111.3	011	2303	13
196	14	Pon	662	6.44498	-5.53	7.3629	21.35	1.01648	16.2543	-26.38	63.564	4.2	86	437	1251.6	2105	1847	2201.3	037	2259	14
197	15	Wto	663	6.48464	-5.59	7.4031	21.26	1.01642	17.1852	-27.32	63.455	5.2	92	438	1251.7	2104	1943	2252.7	113	2255	15
198	16	Śro	664	6.52430	-6.05	7.4433	21.16	1.01637	18.1240	-27.10	63.219	6.2	97	440	1251.8	2103	2027	2344.3	203	2251	16
199	17	Czw	665	6.56395	-6.10	7.4835	21.06	1.01631	19.0604	-25.30	62.881	7.2	99	441	1251.9	2102	2058	****	306	2248	17
200	18	Pią	666	7.00361	-6.14	7.5236	20.55	1.01625	19.5810	-22.38	62.467	0.1	100	442	1252.0	2101	2121	034.9	419	2244	18
201	19	Sob	667	7.04326	-6.18	7.5636	20.44	1.01618	20.4828	-18.41	61.997	1.1	99	444	1252.0	2100	2138	123.7	536	2240	19
202	20	Nie	668	7.08292	-6.22	8.0036	20.33	1.01611	21.3660	-13.53	61.487	2.1	96	445	1252.1	2058	2151	210.5	655	2236	20
203	21	Pon	669	7.12258	-6.24	8.0435	20.21	1.01604	22.2409	-8.25	60.948	3.1	91	446	1252.2	2057	2202	255.6	814	2232	21
204	22	Wto	670	7.16223	-6.27	8.0834	20.10	1.01596	23.1042	-2.30	60.386	4.1	84	448	1252.2	2056	2213	339.6	933	2228	22
205	23	Śro	671	7.20189	-6.28	8.1232	19.57	1.01588	23.5738	3.37	59.809	5.1	75	449	1252.2	2054	2224	423.6	1052	2224	23
206	24	Czw	672	7.24154	-6.29	8.1630	19.45	1.01580	0.4604	9.41	59.226	6.1	65	451	1252.2	2053	2236	508.9	1214	2220	24
207	25	Pią	673	7.28120	-6.30	8.2027	19.32	1.01571	1.3709	15.24	58.653	7.1	54	452	1252.2	2051	2251	556.8	1340	2216	25
208	26	Sob	674	7.32085	-6.30	8.2424	19.18	1.01561	2.3159	20.27	58.114	0.6	43	454	1252.2	2050	2313	648.5	1509	2212	26
209	27	Nie	675	7.36051	-6.29	8.2820	19.05	1.01552	3.3109	24.25	57.645	1.6	32	455	1252.2	2048	2345	745.0	1639	2208	27
210	28	Pon	676	7.40016	-6.28	8.3215	18.51	1.01541	4.3422	26.54	57.287	2.6	21	457	1252.2	2046	****	846.2	1801	2204	28
211	29	Wto	677	7.43582	-6.26	8.3610	18.37	1.01531	5.4007	27.34	57.084	3.6	12	459	1252.2	2045	033	950.6	1908	2200	29
212	30	Śro	678	7.47548	-6.24	8.4004	18.22	1.01519	6.4552	26.18	57.073	4.6	6	500	1252.1	2043	142	1055.3	1954	2156	30
213	31	Czw	679	7.51513	-6.21	8.4358	18.07	1.01507	7.4906	23.14	57.276	5.6	1	502	1252.1	2041	308	1157.2	2024	2153	31

Fazy Księżyca [Dm, h.mm]: Nów 3, 4.19 1kw 10, 6.35 Pełn 18, 9.59 3kw 25, 20.41

LIPIEC 2008 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	*****	*****	3.20	19.15	4.53	21.41	9.04	23.28	21.33	5.20	9.29	23.40	23.55	11.26	23.03	8.40	19.36	4.35		
	6.721	23.07	5.178	19.72	7.168	23.34	10.157	12.59	19.336	-22.34	10.470	11.41	23.571	-3.63	21.758	-13.86	17.973	-16.96	18.62800	1
3	*****	*****	3.17	19.19	4.58	21.42	9.03	23.22	21.25	5.11	9.22	23.32	23.47	11.18	22.55	8.32	19.28	4.27		
	6.858	22.91	5.314	20.24	7.345	23.09	10.232	12.15	19.318	-22.38	10.481	11.34	23.570	-3.64	21.756	-13.87	17.970	-16.97	18.75943	3
5	*****	*****	3.15	19.24	5.03	21.42	9.02	23.16	21.16	5.02	9.16	23.24	23.39	11.10	22.47	8.24	19.20	4.19		
	6.996	22.73	5.470	20.77	7.522	22.79	10.308	11.70	19.300	-22.42	10.493	11.27	23.569	-3.64	21.754	-13.88	17.966	-16.97	18.89085	5
7	*****	*****	3.14	19.31	5.08	21.42	9.01	23.10	21.07	4.53	9.09	23.17	23.31	11.02	22.39	8.16	19.12	4.11		
	7.132	22.52	5.648	21.30	7.698	22.45	10.383	11.25	19.281	-22.46	10.505	11.20	23.568	-3.65	21.751	-13.90	17.963	-16.98	19.02227	7
9	*****	*****	3.14	19.39	5.13	21.42	9.01	23.04	20.59	4.43	9.02	23.09	23.23	10.54	22.31	8.08	19.03	4.03		
	7.269	22.29	5.847	21.81	7.872	22.06	10.459	10.79	19.263	-22.50	10.517	11.13	23.567	-3.66	21.748	-13.91	17.959	-16.98	19.15369	9
11	*****	*****	3.16	19.47	5.19	21.41	8.60	22.58	20.50	4.34	8.55	23.02	23.15	10.46	22.24	7.60	18.55	3.54		
	7.405	22.03	6.065	22.26	8.046	21.63	10.534	10.33	19.245	-22.53	10.529	11.05	23.566	-3.67	21.746	-13.93	17.956	-16.99	19.28511	11
13	*****	*****	3.19	19.56	5.25	21.40	8.59	22.52	20.41	4.25	8.49	22.54	23.08	10.38	22.16	7.52	18.47	3.46		
	7.540	21.74	6.302	22.63	8.219	21.16	10.610	9.86	19.226	-22.57	10.542	10.97	23.565	-3.68	21.743	-13.94	17.953	-17.00	19.41653	13
15	*****	*****	3.25	20.06	5.31	21.39	8.59	22.46	20.33	4.16	8.42	22.47	22.60	10.30	22.08	7.44	18.39	3.38		
	7.675	21.43	6.557	22.89	8.391	20.65	10.685	9.39	19.208	-22.61	10.555	10.90	23.563	-3.69	21.740	-13.96	17.950	-17.00	19.54795	15
17	*****	*****	3.32	20.15	5.37	21.37	8.58	22.40	20.24	4.06	8.36	22.39	22.52	10.22	21.60	7.36	18.31	3.30		
	7.810	21.10	6.828	23.03	8.561	20.10	10.761	8.91	19.190	-22.64	10.568	10.82	23.561	-3.70	21.737	-13.97	17.946	-17.01	19.67937	17
19	*****	*****	3.41	20.24	5.44	21.35	8.57	22.34	20.15	3.57	8.29	22.32	22.44	10.14	21.52	7.27	18.23	3.22		
	7.943	20.74	7.112	23.01	8.730	19.51	10.836	8.43	19.172	-22.68	10.582	10.74	23.559	-3.72	21.734	-13.99	17.943	-17.01	19.81080	19
21	*****	*****	3.52	20.32	5.50	21.33	8.57	22.28	20.07	3.48	8.22	22.24	22.36	10.06	21.44	7.19	18.15	3.14		
	8.077	20.36	7.406	22.82	8.898	18.89	10.912	7.95	19.155	-22.71	10.595	10.66	23.557	-3.73	21.731	-14.00	17.940	-17.02	19.94221	21
23	*****	*****	4.05	20.40	5.57	21.31	8.56	22.22	19.58	3.39	8.16	22.17	22.28	9.58	21.36	7.11	18.07	3.06		
	8.209	19.95	7.705	22.46	9.064	18.23	10.987	7.46	19.137	-22.74	10.609	10.57	23.555	-3.75	21.728	-14.02	17.937	-17.03	20.07363	23
25	*****	*****	4.20	20.46	6.03	21.28	8.55	22.16	19.49	3.30	8.09	22.09	22.20	9.49	21.28	7.03	17.59	2.58		
	8.341	19.53	8.007	21.91	9.230	17.53	11.063	6.97	19.120	-22.77	10.623	10.49	23.552	-3.77	21.725	-14.04	17.935	-17.04	20.20505	25
27	*****	*****	4.35	20.50	6.10	21.26	8.55	22.10	19.41	3.21	8.03	22.02	22.12	9.41	21.20	6.55	17.51	2.50		
	8.472	19.08	8.306	21.20	9.394	16.81	11.139	6.47	19.104	-22.81	10.637	10.41	23.549	-3.79	21.721	-14.05	17.932	-17.04	20.33647	27
29	1.17	0.04	4.51	20.54	6.16	21.23	8.54	22.04	19.32	3.12	7.56	21.54	22.04	9.33	21.12	6.47	17.43	2.42		
	8.603	18.61	8.600	20.32	9.556	16.05	11.214	5.97	19.087	-22.83	10.651	10.32	23.546	-3.81	21.718	-14.07	17.929	-17.05	20.46790	29
31	1.38	-0.08	5.07	20.56	6.23	21.20	8.53	21.58	19.23	3.03	7.50	21.47	21.56	9.25	21.04	6.38	17.35	2.34		
	8.733	18.12	8.887	19.32	9.717	15.27	11.290	5.47	19.072	-22.86	10.666	10.23	23.543	-3.83	21.715	-14.09	17.927	-17.06	20.59932	31

SIERPIEŃ 2008

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2454																		
214	1	Pią	680	7.55479	-6.17	8.4750	17.52	1.01495	8.4816	18.43	57.695	6.6	0	503	1252.0	2040	440	1254.5	2045	2149	1
215	2	Sob	681	7.59444	-6.13	8.5143	17.37	1.01482	9.4304	13.13	58.306	1.0	1	505	1252.0	2038	611	1347.0	2100	2145	2
216	3	Nie	682	8.03410	-6.08	8.5535	17.21	1.01468	10.3404	7.10	59.064	2.0	5	507	1251.9	2036	738	1435.3	2112	2141	3
217	4	Pon	683	8.07376	-6.03	8.5926	17.05	1.01454	11.2218	0.59	59.908	3.0	11	508	1251.8	2034	901	1520.7	2123	2137	4
218	5	Wto	684	8.11341	-5.57	9.0316	16.49	1.01440	12.0855	-5.05	60.771	4.0	18	510	1251.7	2032	1020	1604.6	2134	2133	5
219	6	Śro	685	8.15307	-5.50	9.0706	16.32	1.01424	12.5459	-10.45	61.586	5.0	27	512	1251.6	2030	1138	1648.0	2145	2129	6
220	7	Czw	686	8.19272	-5.43	9.1055	16.15	1.01409	13.4128	-15.52	62.295	6.0	36	513	1251.5	2029	1255	1732.0	2158	2125	7
221	8	Pią	687	8.23238	-5.35	9.1444	15.58	1.01392	14.2908	-20.15	62.853	7.0	46	515	1251.3	2027	1411	1817.5	2215	2121	8
222	9	Sob	688	8.27203	-5.27	9.1832	15.41	1.01376	15.1830	-23.44	63.229	0.6	55	517	1251.2	2025	1525	1905.0	2238	2117	9
223	10	Nie	689	8.31169	-5.18	9.2220	15.24	1.01359	16.0943	-26.10	63.411	1.6	65	518	1251.0	2023	1635	1954.4	2310	2113	10
224	11	Pon	690	8.35134	-5.08	9.2607	15.06	1.01342	17.0230	-27.27	63.398	2.6	74	520	1250.9	2021	1736	2045.4	2354	2109	11
225	12	Wto	691	8.39100	-4.58	9.2953	14.48	1.01324	17.5609	-27.27	63.207	3.6	82	522	1250.7	2019	1824	2137.0	****	2105	12
226	13	Śro	692	8.43066	-4.47	9.3339	14.29	1.01306	18.4946	-26.10	62.865	4.6	88	523	1250.5	2017	1900	2228.1	053	2101	13
227	14	Czw	693	8.47031	-4.36	9.3724	14.11	1.01288	19.4227	-23.39	62.405	5.6	94	525	1250.3	2014	1926	2317.9	202	2057	14
228	15	Pią	694	8.50597	-4.24	9.4109	13.52	1.01269	20.3337	-19.59	61.867	6.6	98	527	1250.1	2012	1945	*****	319	2054	15
229	16	Sob	695	8.54562	-4.11	9.4453	13.33	1.01251	21.2307	-15.21	61.290	7.6	100	528	1249.9	2010	1959	005.8	438	2050	16
230	17	Nie	696	8.58528	-3.58	9.4836	13.14	1.01232	22.1115	-9.58	60.709	0.5	100	530	1249.7	2008	2011	052.1	558	2046	17
231	18	Pon	697	9.02493	-3.45	9.5220	12.55	1.01213	22.5837	-4.04	60.153	1.5	97	532	1249.5	2006	2022	137.1	718	2042	18
232	19	Wto	698	9.06459	-3.31	9.5602	12.35	1.01193	23.4605	2.07	59.640	2.5	93	534	1249.3	2004	2033	221.8	839	2038	19
233	20	Śro	699	9.10424	-3.17	9.5944	12.15	1.01174	0.3438	8.18	59.182	3.5	86	535	1249.0	2002	2045	307.3	1001	2034	20
234	21	Czw	700	9.14390	-3.02	10.0326	11.55	1.01154	1.2521	14.10	58.784	4.5	78	537	1248.8	1959	2059	354.7	1126	2030	21
235	22	Pią	701	9.18355	-2.46	10.0707	11.35	1.01134	2.1910	19.24	58.445	5.5	68	539	1248.5	1957	2118	445.2	1254	2026	22
236	23	Sob	702	9.22321	-2.31	10.1048	11.15	1.01113	3.1643	23.36	58.169	6.5	57	540	1248.3	1955	2145	539.7	1424	2022	23
237	24	Nie	703	9.26287	-2.15	10.1429	10.54	1.01092	4.1754	26.26	57.963	0.4	45	542	1248.0	1953	2227	638.4	1548	2018	24
238	25	Pon	704	9.30252	-1.58	10.1809	10.34	1.01071	5.2136	27.35	57.837	1.4	34	544	1247.7	1950	2326	740.4	1659	2014	25
239	26	Wto	705	9.34218	-1.41	10.2148	10.13	1.01050	6.2547	26.54	57.810	2.4	23	546	1247.4	1948	****	843.3	1750	2010	26
240	27	Śro	706	9.38183	-1.24	10.2528	9.52	1.01028	7.2816	24.26	57.902	3.4	14	547	1247.1	1946	044	944.6	1825	2006	27
241	28	Czw	707	9.42149	-1.06	10.2906	9.30	1.01006	8.2728	20.29	58.129	4.4	7	549	1246.9	1944	213	1042.4	1849	2002	28
242	29	Pią	708	9.46114	-0.48	10.3245	9.09	1.00983	9.2248	15.23	58.498	5.4	2	551	1246.6	1941	343	1135.8	1906	1958	29
243	30	Sob	709	9.50080	-0.30	10.3623	8.48	1.00960	10.1436	9.34	59.005	6.4	0	552	1246.2	1939	511	1225.4	1919	1955	30
244	31	Nie	710	9.54045	-0.11	10.4001	8.26	1.00937	11.0341	3.25	59.627	0.6	0	554	1245.9	1937	635	1311.8	1930	1951	31

Fazy Księżyca [Dm, h.mm]: Nów 1, 12.12 1kw 8, 22.20 Pełn 16, 23.16 3kw 24, 1.49 Nów 30, 21.58

WRZESIEŃ 2008

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)											Czas strefowy [hhmm.]							
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2454																					
245	1	Pon	711	9.58011	0.08	10.4339	8.04	1.00913	11.5102	-2.45	60.328	1.6	3	556	1245.6	1934	756	1356.5	1941	1947	1
246	2	Wto	712	10.01576	0.27	10.4716	7.42	1.00889	12.3741	-8.39	61.059	2.6	7	558	1245.3	1932	915	1440.5	1952	1943	2
247	3	Śro	713	10.05542	0.46	10.5053	7.20	1.00864	13.2431	-14.03	61.765	3.6	14	559	1245.0	1930	1033	1524.8	2004	1939	3
248	4	Czw	714	10.09507	1.06	10.5430	6.58	1.00839	14.1219	-18.46	62.392	4.6	21	601	1244.6	1927	1150	1610.3	2020	1935	4
249	5	Pią	715	10.13473	1.26	10.5807	6.36	1.00814	15.0135	-22.36	62.893	5.6	30	603	1244.3	1925	1307	1657.4	2040	1931	5
250	6	Sob	716	10.17438	1.46	11.0143	6.14	1.00788	15.5231	-25.25	63.227	6.6	39	604	1244.0	1922	1419	1746.4	2108	1927	6
251	7	Nie	717	10.21404	2.07	11.0519	5.51	1.00762	16.4455	-27.06	63.370	7.6	48	606	1243.6	1920	1524	1836.8	2148	1923	7
252	8	Pon	718	10.25370	2.28	11.0855	5.28	1.00736	17.3814	-27.32	63.311	0.8	58	608	1243.3	1918	1618	1928.1	2240	1919	8
253	9	Wto	719	10.29335	2.48	11.1231	5.06	1.00710	18.3139	-26.42	63.054	1.8	67	610	1242.9	1915	1659	2019.2	2345	1915	9
254	10	Śro	720	10.33301	3.09	11.1606	4.43	1.00683	19.2423	-24.36	62.620	2.8	76	611	1242.6	1913	1728	2109.2	****	1911	10
255	11	Czw	721	10.37266	3.31	11.1941	4.20	1.00656	20.1551	-21.21	62.043	3.8	84	613	1242.2	1910	1749	2157.7	058	1907	11
256	12	Pią	722	10.41232	3.52	11.2317	3.57	1.00630	21.0551	-17.03	61.367	4.8	90	615	1241.9	1908	1805	2244.7	217	1903	12
257	13	Sob	723	10.45197	4.13	11.2652	3.34	1.00603	21.5437	-11.54	60.646	5.8	96	616	1241.5	1906	1818	2330.5	337	1900	13
258	14	Nie	724	10.49163	4.35	11.3027	3.11	1.00576	22.4240	-6.06	59.933	6.8	99	618	1241.2	1903	1830	*****	457	1856	14
259	15	Pon	725	10.53128	4.56	11.3402	2.48	1.00549	23.3047	0.06	59.280	0.0	100	620	1240.8	1901	1841	016.0	619	1852	15
260	16	Wto	726	10.57094	5.18	11.3737	2.25	1.00522	0.1956	6.25	58.727	1.0	99	621	1240.5	1858	1853	102.0	742	1848	16
261	17	Śro	727	11.01059	5.39	11.4112	2.02	1.00495	1.1107	12.32	58.301	2.0	95	623	1240.1	1856	1907	149.7	908	1844	17
262	18	Czw	728	11.05025	6.01	11.4447	1.39	1.00468	2.0514	18.04	58.016	3.0	89	625	1239.7	1853	1924	240.3	1037	1840	18
263	19	Pią	729	11.08590	6.22	11.4822	1.16	1.00441	3.0252	22.37	57.867	4.0	80	627	1239.4	1851	1949	334.7	1208	1836	19
264	20	Sob	730	11.12556	6.43	11.5158	0.52	1.00414	4.0354	25.49	57.840	5.0	70	628	1239.0	1849	2026	433.0	1335	1832	20
265	21	Nie	731	11.16521	7.05	11.5533	0.29	1.00387	5.0715	27.22	57.918	6.0	59	630	1238.7	1846	2120	534.4	1451	1828	21
266	22	Pon	732	11.20487	7.26	11.5908	0.06	1.00359	6.1101	27.06	58.081	0.2	48	632	1238.3	1844	2232	636.9	1548	1824	22
267	23	Wto	733	11.24453	7.47	12.0244	-0.18	1.00332	7.1306	25.05	58.317	1.2	36	634	1238.0	1841	2356	738.0	1627	1820	23
268	24	Śro	734	11.28418	8.08	12.0619	-0.41	1.00304	8.1158	21.34	58.617	2.2	26	635	1237.6	1839	****	835.8	1654	1816	24
269	25	Czw	735	11.32384	8.28	12.0955	-1.04	1.00277	9.0705	16.53	58.980	3.2	17	637	1237.3	1837	124	929.3	1712	1812	25
270	26	Pią	736	11.36349	8.49	12.1331	-1.28	1.00249	9.5844	11.24	59.405	4.2	9	639	1236.9	1834	251	1018.9	1726	1808	26
271	27	Sob	737	11.40315	9.09	12.1708	-1.51	1.00221	10.4740	5.27	59.892	5.2	4	640	1236.6	1832	414	1105.5	1738	1804	27
272	28	Nie	738	11.44280	9.29	12.2044	-2.15	1.00193	11.3453	-0.38	60.431	6.2	1	642	1236.3	1829	535	1150.1	1749	1801	28
273	29	Pon	739	11.48246	9.49	12.2421	-2.38	1.00164	12.2123	-6.35	61.009	0.1	0	644	1235.9	1827	653	1234.0	1800	1757	29
274	30	Wto	740	11.52211	10.09	12.2758	-3.01	1.00136	13.0803	-12.09	61.600	1.1	1	646	1235.6	1824	811	1318.1	1812	1753	30

Fazy Księżyca [Dm, h.mm]: 1kw 7, 16.04 Pełn 15, 11.13 3kw 22, 7.04 Nów 29, 10.12

WRZESIEŃ 2008 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	3.45	21.45	8.29	20.04	8.09	20.15	8.46	20.21	17.10	0.45	6.07	19.47	19.49	7.13	18.57	4.28	15.29	0.25		
	10.727	8.07	12.240	-2.82	12.164	0.09	12.524	-2.85	18.915	-23.14	10.911	8.76	23.478	-4.26	21.659	-14.38	17.901	-17.20	22.70203	1
3	3.50	21.39	8.36	19.58	8.15	20.11	8.46	20.15	17.02	0.37	6.00	19.40	19.41	7.05	18.49	4.19	15.21	0.17		
	10.848	7.34	12.387	-4.09	12.312	-0.94	12.603	-3.38	18.913	-23.14	10.926	8.67	23.473	-4.29	21.656	-14.39	17.901	-17.21	22.83344	3
5	3.55	21.33	8.44	19.52	8.22	20.06	8.45	20.09	16.54	0.29	5.54	19.32	19.33	6.56	18.41	4.11	15.13	0.09		
	10.968	6.60	12.528	-5.32	12.461	-1.97	12.682	-3.91	18.911	-23.15	10.942	8.57	23.469	-4.32	21.652	-14.41	17.900	-17.22	22.96486	5
7	3.60	21.26	8.50	19.46	8.28	20.02	8.45	20.03	16.47	0.21	5.48	19.25	19.25	6.48	18.33	4.03	15.06	0.02		
	11.089	5.85	12.661	-6.49	12.609	-3.00	12.762	-4.44	18.910	-23.15	10.958	8.48	23.464	-4.35	21.649	-14.43	17.900	-17.23	23.09628	7
9	4.05	21.20	8.56	19.40	8.35	19.57	8.45	19.57	16.39	0.14	5.41	19.17	19.17	6.40	18.25	3.55	14.58	23.50		
	11.208	5.10	12.786	-7.59	12.758	-4.03	12.842	-4.97	18.910	-23.15	10.974	8.38	23.459	-4.38	21.646	-14.44	17.900	-17.24	23.22771	9
11	4.09	21.14	9.00	19.33	8.41	19.53	8.45	19.51	16.31	0.06	5.35	19.10	19.09	6.31	18.17	3.47	14.50	23.42		
	11.328	4.34	12.902	-8.62	12.907	-5.05	12.922	-5.49	18.911	-23.15	10.989	8.29	23.454	-4.41	21.643	-14.46	17.900	-17.25	23.35913	11
13	4.14	21.08	9.04	19.27	8.48	19.49	8.44	19.46	16.23	23.54	5.28	19.02	19.01	6.23	18.09	3.39	14.42	23.34		
	11.448	3.57	13.008	-9.55	13.056	-6.06	13.002	-6.02	18.913	-23.15	11.005	8.20	23.449	-4.44	21.640	-14.47	17.900	-17.26	23.49054	13
15	4.19	21.02	9.06	19.20	8.54	19.44	8.44	19.40	16.15	23.46	5.22	18.55	18.53	6.15	18.01	3.31	14.34	23.26		
	11.567	2.81	13.101	-10.39	13.206	-7.07	13.083	-6.54	18.916	-23.15	11.021	8.10	23.444	-4.48	21.637	-14.49	17.901	-17.27	23.62196	15
17	4.23	20.56	9.07	19.12	9.01	19.40	8.44	19.34	16.08	23.39	5.16	18.48	18.45	6.06	17.53	3.22	14.27	23.18		
	11.687	2.03	13.180	-11.12	13.356	-8.07	13.165	-7.06	18.920	-23.15	11.036	8.01	23.439	-4.51	21.634	-14.50	17.901	-17.28	23.75337	17
19	4.27	20.51	9.07	19.05	9.07	19.36	8.44	19.28	16.00	23.31	5.09	18.40	18.37	5.58	17.45	3.14	14.19	23.10		
	11.806	1.26	13.243	-11.70	13.507	-9.05	13.247	-7.58	18.925	-23.15	11.052	7.92	23.434	-4.54	21.631	-14.52	17.902	-17.29	23.88479	19
21	4.32	20.45	9.04	18.57	9.14	19.31	8.44	19.22	15.53	23.24	5.03	18.33	18.29	5.50	17.37	3.06	14.11	23.02		
	11.926	0.48	13.287	-12.13	13.658	-10.03	13.329	-8.09	18.930	-23.14	11.067	7.82	23.429	-4.57	21.629	-14.53	17.903	-17.30	0.01622	21
23	4.36	20.40	8.59	18.49	9.21	19.27	8.44	19.17	15.45	23.16	4.56	18.25	18.21	5.41	17.29	2.58	14.03	22.54		
	12.045	-0.30	13.309	-12.37	13.811	-10.99	13.412	-8.61	18.937	-23.13	11.082	7.73	23.425	-4.60	21.626	-14.54	17.904	-17.31	0.14764	23
25	4.40	20.34	8.51	18.41	9.27	19.23	8.44	19.11	15.38	23.09	4.50	18.18	18.13	5.33	17.21	2.50	13.56	22.47		
	12.165	-1.07	13.307	-12.40	13.964	-11.93	13.495	-9.12	18.944	-23.13	11.098	7.64	23.420	-4.63	21.624	-14.55	17.905	-17.32	0.27906	25
27	4.44	20.29	8.40	18.33	9.34	19.19	8.44	19.05	15.30	23.02	4.43	18.10	18.05	5.25	17.13	2.42	13.48	22.39		
	12.285	-1.85	13.277	-12.17	14.118	-12.86	13.578	-9.63	18.953	-23.12	11.113	7.55	23.415	-4.66	21.621	-14.57	17.906	-17.33	0.41048	27
29	4.48	20.24	8.26	18.24	9.41	19.15	8.44	18.60	15.23	22.54	4.37	18.03	17.57	5.17	17.05	2.34	13.40	22.31		
	12.406	-2.63	13.218	-11.66	14.274	-13.76	13.662	-10.13	18.962	-23.11	11.128	7.46	23.410	-4.69	21.619	-14.58	17.908	-17.34	0.54189	29

PAŹDZIERNIK 2008

Piwnice, CA UMK ← Dane na godz. 12 czasu strefowego (= 10 lub 11 ^b UT) →													Czas strefowy [hhmm.]									
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
2454																						
275	1	Śro	741	11.56177	10.28	12.3135	-3.25	1.00107	13.5539	-17.06	62.169	2.1	4	647	1235.3	1822	929	1403.2	1826	1749	1	
276	2	Czw	742	12.00142	10.47	12.3513	-3.48	1.00078	14.4440	-21.16	62.679	3.1	9	649	1235.0	1820	1046	1449.9	1844	1745	2	
277	3	Pią	743	12.04108	11.06	12.3850	-4.11	1.00049	15.3520	-24.27	63.087	4.1	16	651	1234.6	1817	1201	1538.4	1909	1741	3	
278	4	Sob	744	12.08073	11.24	12.4229	-4.34	1.00019	16.2727	-26.31	63.356	5.1	23	653	1234.3	1815	1310	1628.5	1944	1737	4	
279	5	Nie	745	12.12039	11.42	12.4607	-4.57	0.99990	17.2029	-27.21	63.454	6.1	32	655	1234.0	1813	1408	1719.4	2031	1733	5	
280	6	Pon	746	12.16005	11.60	12.4946	-5.20	0.99961	18.1339	-26.56	63.360	7.1	41	656	1233.7	1810	1454	1810.2	2130	1729	6	
281	7	Wto	747	12.19570	12.17	12.5325	-5.43	0.99931	19.0607	-25.17	63.067	0.0	50	658	1233.5	1808	1527	1900.1	2240	1725	7	
282	8	Śro	748	12.23536	12.34	12.5705	-6.06	0.99902	19.5721	-22.28	62.580	1.0	60	700	1233.2	1806	1552	1948.6	2355	1721	8	
283	9	Czw	749	12.27501	12.50	13.0045	-6.29	0.99873	20.4708	-18.37	61.925	2.0	69	702	1232.9	1803	1609	2035.4	****	1717	9	
284	10	Pią	750	12.31467	13.06	13.0426	-6.52	0.99843	21.3541	-13.52	61.141	3.0	78	703	1232.6	1801	1624	2121.1	113	1713	10	
285	11	Sob	751	12.35432	13.22	13.0807	-7.14	0.99814	22.2331	-8.22	60.282	4.0	86	705	1232.4	1759	1636	2206.3	232	1709	11	
286	12	Nie	752	12.39398	13.37	13.1148	-7.37	0.99785	23.1126	-2.21	59.413	5.0	93	707	1232.1	1756	1647	2252.0	352	1705	12	
287	13	Pon	753	12.43363	13.52	13.1530	-7.59	0.99756	0.0024	3.57	58.603	6.0	97	709	1231.9	1754	1659	2339.4	515	1702	13	
288	14	Wto	754	12.47329	14.06	13.1913	-8.21	0.99728	0.5128	10.14	57.919	7.0	100	711	1231.7	1752	1712	*****	640	1658	14	
289	15	Śro	755	12.51294	14.19	13.2256	-8.44	0.99699	1.4539	16.06	57.413	0.6	100	712	1231.4	1749	1729	029.7	810	1654	15	
290	16	Czw	756	12.55260	14.32	13.2639	-9.06	0.99671	2.4341	21.08	57.119	1.6	97	714	1231.2	1747	1752	123.9	943	1650	16	
291	17	Pią	757	12.59225	14.44	13.3024	-9.28	0.99643	3.4533	24.52	57.045	2.6	91	716	1231.0	1745	1825	222.6	1115	1646	17	
292	18	Sob	758	13.03191	14.56	13.3408	-9.49	0.99615	4.5010	26.56	57.177	3.6	83	718	1230.8	1743	1914	325.0	1237	1642	18	
293	19	Nie	759	13.07157	15.07	13.3754	-10.11	0.99588	5.5527	27.07	57.481	4.6	73	720	1230.6	1741	2022	429.1	1342	1638	19	
294	20	Pon	760	13.11122	15.18	13.4140	-10.32	0.99561	6.5858	25.28	57.913	5.6	62	722	1230.5	1738	2144	532.1	1428	1634	20	
295	21	Wto	761	13.15088	15.27	13.4527	-10.54	0.99533	7.5857	22.15	58.430	6.6	51	724	1230.3	1736	2312	631.4	1458	1630	21	
296	22	Śro	762	13.19053	15.36	13.4914	-11.15	0.99506	8.5443	17.50	58.991	0.9	40	725	1230.1	1734	****	726.1	1518	1626	22	
297	23	Czw	763	13.23019	15.45	13.5303	-11.36	0.99479	9.4634	12.34	59.569	1.9	29	727	1230.0	1732	038	816.4	1534	1622	23	
298	24	Pią	764	13.26584	15.52	13.5652	-11.57	0.99453	10.3522	6.50	60.144	2.9	20	729	1229.9	1730	201	903.1	1546	1618	24	
299	25	Sob	765	13.30550	15.59	14.0041	-12.18	0.99426	11.2211	0.54	60.706	3.9	12	731	1229.8	1728	321	947.4	1557	1614	25	
300	26	Nie	766	13.34515	16.06	14.0432	-12.38	0.99399	12.0806	-4.58	61.248	4.9	6	733	1229.7	1726	438	1030.7	1608	1610	26	
300	26	Nie	766	14.35014	16.06	14.0441	-12.39	0.99398	12.1001	-5.13	61.270	5.9	6	633	1129.7	1626	338	930.7	1508	1510	26	
301	27	Pon	767	14.38579	16.11	14.0832	-12.59	0.99372	12.5602	-10.47	61.788	6.9	2	635	1129.6	1624	455	1014.0	1519	1507	27	
302	28	Wto	768	14.42545	16.16	14.1224	-13.19	0.99345	13.4259	-15.50	62.274	7.0	0	637	1129.5	1622	612	1058.3	1533	1503	28	
303	29	Śro	769	14.46511	16.20	14.1617	-13.39	0.99319	14.3127	-20.09	62.716	0.5	0	638	1129.4	1620	729	1144.1	1550	1459	29	
304	30	Czw	770	14.50476	16.23	14.2010	-13.59	0.99292	15.2141	-23.34	63.096	1.5	2	640	1129.4	1618	844	1232.0	1612	1455	30	
305	31	Pią	771	14.54442	16.25	14.2405	-14.18	0.99266	16.1331	-25.54	63.389	2.5	6	642	1129.3	1616	955	1321.6	1644	1451	31	

Fazy Księżyca [Dm, h.mm]: 1kw 7, 11.04 Pełn 14, 22.02 3kw 21, 13.55 3kw 21, 12.55 Now 29, 0.14

PAŹDZIERNIK 2008 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.52	20.18	8.08	18.16	9.48	19.12	8.44	18.54	15.15	22.47	4.30	17.55	17.49	5.08	16.57	2.26	13.33	22.23		
	12.526	-3.41	13.132	-10.86	14.430	-14.65	13.747	-10.64	18.972	-23.09	11.143	7.37	23.406	-4.72	21.617	-14.59	17.909	-17.35	0.67331	1
3	4.56	20.13	7.47	18.08	9.54	19.08	8.44	18.48	15.08	22.40	4.24	17.48	17.41	4.60	16.49	2.18	13.25	22.15		
	12.647	-4.18	13.022	-9.77	14.588	-15.51	13.832	-11.13	18.983	-23.08	11.158	7.28	23.401	-4.75	21.615	-14.60	17.911	-17.36	0.80473	3
5	4.59	20.08	7.25	17.60	10.01	19.04	8.44	18.43	15.01	22.33	4.17	17.40	17.33	4.52	16.42	2.10	13.17	22.07		
	12.769	-4.95	12.897	-8.45	14.747	-16.35	13.918	-11.63	18.994	-23.07	11.172	7.20	23.397	-4.77	21.613	-14.61	17.913	-17.37	0.93615	5
7	5.03	20.04	7.01	17.52	10.08	19.01	8.44	18.37	14.54	22.26	4.11	17.33	17.25	4.43	16.34	2.02	13.09	21.60		
	12.890	-5.72	12.768	-6.98	14.907	-17.16	14.004	-12.11	19.007	-23.05	11.187	7.11	23.392	-4.80	21.611	-14.62	17.915	-17.38	1.06757	7
9	5.07	19.59	6.38	17.45	10.15	18.58	8.44	18.32	14.46	22.19	4.04	17.25	17.17	4.35	16.26	1.54	13.02	21.52		
	13.013	-6.48	12.651	-5.51	15.068	-17.95	14.909	-12.60	19.020	-23.03	11.201	7.02	23.388	-4.83	21.609	-14.63	17.917	-17.39	1.19899	9
11	5.10	19.54	6.18	17.39	10.22	18.55	8.44	18.26	14.39	22.12	3.58	17.18	17.09	4.27	16.18	1.46	12.54	21.44		
	13.135	-7.24	12.557	-4.17	15.230	-18.70	14.178	-13.08	19.034	-23.01	11.215	6.94	23.384	-4.85	21.608	-14.63	17.919	-17.40	1.33041	11
13	5.14	19.49	6.01	17.33	10.28	18.52	8.44	18.21	14.32	22.05	3.51	17.11	17.01	4.19	16.10	1.38	12.46	21.36		
	13.258	-7.98	12.499	-3.09	15.394	-19.42	14.265	-13.55	19.049	-22.99	11.229	6.86	23.380	-4.88	21.606	-14.64	17.921	-17.41	1.46182	13
15	5.18	19.45	5.48	17.28	10.35	18.49	8.44	18.16	14.25	21.59	3.45	17.03	16.53	4.10	16.02	1.30	12.39	21.28		
	13.382	-8.73	12.482	-2.35	15.559	-20.11	14.354	-14.02	19.064	-22.97	11.243	6.77	23.376	-4.90	21.605	-14.65	17.924	-17.42	1.59324	15
17	5.21	19.41	5.39	17.24	10.42	18.47	8.45	18.10	14.18	21.52	3.38	16.56	16.45	4.02	15.54	1.22	12.31	21.21		
	13.507	-9.46	12.508	-2.00	15.725	-20.77	14.443	-14.48	19.081	-22.95	11.257	6.69	23.372	-4.93	21.604	-14.65	17.927	-17.43	1.72466	17
19	5.25	19.36	5.36	17.20	10.48	18.45	8.45	18.05	14.11	21.45	3.31	16.48	16.37	3.54	15.46	1.14	12.23	21.13		
	13.632	-10.18	12.573	-2.01	15.893	-21.39	14.532	-14.93	19.098	-22.92	11.271	6.61	23.368	-4.95	21.602	-14.66	17.929	-17.44	1.85608	19
21	5.28	19.32	5.36	17.16	10.54	18.43	8.45	17.60	14.04	21.39	3.25	16.41	16.29	3.46	15.38	1.06	12.16	21.05		
	13.757	-10.90	12.673	-2.36	16.062	-21.97	14.622	-15.38	19.116	-22.90	11.284	6.54	23.365	-4.97	21.602	-14.66	17.932	-17.45	1.98750	21
23	5.32	19.28	5.39	17.13	11.01	18.41	8.45	17.55	13.57	21.32	3.18	16.33	16.21	3.38	15.30	0.58	12.08	20.57		
	13.884	-11.60	12.801	-2.99	16.232	-22.51	14.713	-15.82	19.134	-22.87	11.297	6.46	23.361	-4.99	21.601	-14.67	17.935	-17.46	2.11892	23
25	5.35	19.24	5.44	17.09	11.07	18.40	8.46	17.50	13.50	21.26	3.11	16.26	16.13	3.29	15.22	0.50	12.01	20.50		
	14.011	-12.29	12.951	-3.84	16.403	-23.02	14.805	-16.25	19.153	-22.84	11.310	6.38	23.358	-5.01	21.600	-14.67	17.939	-17.46	2.25034	25
27	4.38	18.21	4.52	16.06	10.13	17.39	7.46	16.45	12.43	20.19	2.05	15.18	15.05	2.21	14.15	23.38	10.53	19.42		
	14.142	-12.99	13.121	-4.87	16.579	-23.48	14.899	-16.69	19.173	-22.81	11.323	6.31	23.355	-5.03	21.600	-14.67	17.942	-17.47	2.38176	27
29	4.42	18.17	5.01	16.03	10.19	17.38	7.46	16.40	12.36	20.13	1.58	15.11	14.57	2.13	14.07	23.30	10.45	19.34		
	14.271	-13.65	13.300	-6.01	16.753	-23.90	14.991	-17.11	19.194	-22.77	11.335	6.24	23.352	-5.05	21.599	-14.68	17.945	-17.48	2.51317	29
31	4.45	18.14	5.11	15.59	10.24	17.38	7.47	16.35	12.29	20.07	1.51	15.03	14.50	2.05	13.59	23.22	10.38	19.27		
	14.401	-14.30	13.488	-7.23	16.927	-24.27	15.085	-17.51	19.215	-22.74	11.347	6.17	23.349	-5.06	21.599	-14.68	17.949	-17.49	2.64459	31

LISTOPAD 2008

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2454																					
306	1	Sob	772	14.58407	16.27	14.2760	-14.37	0.99240	17.0624	-27.03	63.568	3.5	11	644	1129.3	1614	1058	1412.3	1726	1447	1
307	2	Nie	773	15.02373	16.27	14.3155	-14.56	0.99213	17.5929	-26.56	63.606	4.5	18	646	1129.3	1612	1148	1503.1	1821	1443	2
308	3	Pon	774	15.06339	16.27	14.3552	-15.15	0.99187	18.5150	-25.36	63.479	5.5	25	648	1129.3	1610	1225	1553.0	1926	1439	3
309	4	Wto	775	15.10304	16.26	14.3950	-15.34	0.99162	19.4249	-23.07	63.171	6.5	34	650	1129.3	1608	1253	1641.3	2038	1435	4
310	5	Śro	776	15.14270	16.25	14.4348	-15.52	0.99136	20.3209	-19.37	62.677	7.5	43	652	1129.3	1606	1313	1727.8	2153	1431	5
311	6	Czw	777	15.18235	16.22	14.4747	-16.10	0.99111	21.1959	-15.13	62.006	0.3	53	654	1129.4	1604	1328	1812.8	2310	1427	6
312	7	Pią	778	15.22201	16.19	14.5147	-16.27	0.99085	22.0652	-10.06	61.183	1.3	63	655	1129.4	1603	1341	1856.9	****	1423	7
313	8	Sob	779	15.26166	16.15	14.5547	-16.45	0.99061	22.5334	-4.24	60.253	2.3	72	657	1129.5	1601	1352	1941.2	027	1419	8
314	9	Nie	780	15.30132	16.10	14.5949	-17.02	0.99036	23.4108	1.40	59.276	3.3	81	659	1129.6	1559	1404	2026.7	146	1415	9
315	10	Pon	781	15.34097	16.04	15.0351	-17.19	0.99012	0.3042	7.52	58.327	4.3	89	701	1129.7	1558	1416	2114.9	308	1411	10
316	11	Wto	782	15.38063	15.57	15.0754	-17.35	0.98989	1.2327	13.53	57.484	5.3	95	703	1129.8	1556	1431	2207.2	435	1408	11
317	12	Śro	783	15.42028	15.50	15.1158	-17.51	0.98965	2.2024	19.17	56.826	6.3	99	705	1129.9	1554	1451	2304.4	607	1404	12
318	13	Czw	784	15.45594	15.42	15.1603	-18.07	0.98943	3.2201	23.35	56.414	0.2	100	707	1130.1	1553	1520	*****	741	1400	13
319	14	Pią	785	15.49559	15.32	15.2009	-18.23	0.98920	4.2737	26.17	56.282	1.2	98	708	1130.2	1551	1603	006.8	911	1356	14
320	15	Sob	786	15.53525	15.22	15.2416	-18.38	0.98898	5.3506	27.05	56.431	2.2	93	710	1130.4	1550	1706	112.7	1027	1352	15
321	16	Nie	787	15.57491	15.11	15.2823	-18.53	0.98877	6.4135	25.52	56.833	3.2	85	712	1130.6	1548	1826	218.9	1122	1348	16
322	17	Pon	788	16.01456	14.60	15.3231	-19.08	0.98856	7.4432	22.55	57.433	4.2	76	714	1130.8	1547	1955	322.1	1158	1344	17
323	18	Wto	789	16.05422	14.47	15.3641	-19.22	0.98835	8.4245	18.36	58.166	5.2	66	716	1131.0	1546	2124	420.3	1223	1340	18
324	19	Śro	790	16.09388	14.34	15.4050	-19.36	0.98815	9.3618	13.24	58.964	6.2	55	717	1131.2	1544	2249	513.1	1240	1336	19
325	20	Czw	791	16.13353	14.19	15.4501	-19.50	0.98796	10.2605	7.41	59.769	0.6	44	719	1131.4	1543	****	601.4	1253	1332	20
326	21	Pią	792	16.17319	14.04	15.4913	-20.03	0.98776	11.1317	1.47	60.537	1.6	34	721	1131.7	1542	010	646.5	1305	1328	21
327	22	Sob	793	16.21284	13.49	15.5325	-20.16	0.98757	11.5906	-4.03	61.239	2.6	24	723	1131.9	1541	128	729.9	1316	1324	22
328	23	Nie	794	16.25250	13.32	15.5739	-20.28	0.98738	12.4439	-9.37	61.859	3.6	16	724	1132.2	1540	244	812.7	1327	1320	23
329	24	Pon	795	16.29215	13.14	16.0153	-20.40	0.98720	13.3053	-14.43	62.391	4.6	10	726	1132.5	1538	400	856.1	1340	1316	24
330	25	Wto	796	16.33181	12.56	16.0607	-20.52	0.98702	14.1832	-19.09	62.835	5.6	5	728	1132.8	1537	516	941.0	1356	1312	25
331	26	Śro	797	16.37146	12.37	16.1023	-21.03	0.98684	15.0759	-22.45	63.192	6.6	1	729	1133.1	1536	631	1027.8	1416	1309	26
332	27	Czw	798	16.41112	12.17	16.1439	-21.14	0.98666	15.5915	-25.20	63.463	7.6	0	731	1133.5	1536	744	1116.7	1445	1305	27
333	28	Pią	799	16.45078	11.57	16.1856	-21.25	0.98649	16.5152	-26.45	63.644	0.8	1	733	1133.8	1535	849	1207.1	1523	1301	28
334	29	Sob	800	16.49043	11.36	16.2314	-21.35	0.98632	17.4459	-26.57	63.726	1.8	3	734	1134.2	1534	943	1257.9	1614	1257	29
335	30	Nie	801	16.53009	11.14	16.2733	-21.44	0.98615	18.3734	-25.54	63.695	2.8	7	736	1134.5	1533	1024	1348.2	1716	1253	30

Fazy Księżyca [Dm, h.mm]: 1kw 6, 5.03 Pełn 13, 7.17 3kw 19, 22.31 Nów 27, 17.55

LISTOPAD 2008 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0 ^h UT)	
1	4.47	18.12	5.16	15.58	10.27	17.38	7.47	16.33	12.26	20.03	1.48	14.59	14.46	2.01	13.55	23.18	10.34	19.23		
	14.467	-14.62	13.584	-7.85	17.014	-24.44	15.132	-17.72	19.226	-22.72	11.353	6.13	23.348	-5.07	21.599	-14.68	17.951	-17.49	2.71031	1
3	4.50	18.09	5.27	15.55	10.32	17.38	7.47	16.28	12.19	19.57	1.41	14.52	14.38	1.53	13.47	23.11	10.26	19.15		
	14.598	-15.25	13.780	-9.13	17.190	-24.74	15.226	-18.11	19.248	-22.68	11.365	6.07	23.345	-5.09	21.599	-14.68	17.954	-17.50	2.84173	3
5	4.53	18.05	5.39	15.51	10.37	17.39	7.47	16.23	12.12	19.51	1.34	14.44	14.30	1.45	13.39	23.03	10.19	19.07		
	14.730	-15.86	13.980	-10.42	17.366	-25.00	15.321	-18.50	19.270	-22.64	11.376	6.00	23.343	-5.10	21.599	-14.68	17.958	-17.51	2.97315	5
7	4.57	18.02	5.50	15.49	10.41	17.40	7.48	16.19	12.06	19.45	1.27	14.37	14.22	1.37	13.31	22.55	10.11	18.60		
	14.863	-16.46	14.183	-11.70	17.542	-25.21	15.417	-18.87	19.293	-22.60	11.387	5.94	23.341	-5.11	21.600	-14.67	17.962	-17.52	3.10457	7
9	4.60	17.60	6.02	15.46	10.45	17.41	7.48	16.14	11.59	19.39	1.21	14.29	14.14	1.29	13.24	22.47	10.04	18.52		
	14.997	-17.03	14.388	-12.96	17.719	-25.37	15.514	-19.24	19.317	-22.56	11.398	5.88	23.339	-5.12	21.600	-14.67	17.966	-17.53	3.23599	9
11	5.03	17.57	6.14	15.43	10.49	17.43	7.48	16.10	11.52	19.32	1.14	14.22	14.06	1.21	13.16	22.39	9.56	18.44		
	15.132	-17.59	14.595	-14.19	17.896	-25.48	15.611	-19.60	19.341	-22.52	11.409	5.82	23.337	-5.13	21.601	-14.67	17.970	-17.53	3.36740	11
13	5.06	17.54	6.25	15.40	10.52	17.45	7.49	16.05	11.45	19.26	1.07	14.14	13.58	1.13	13.08	22.31	9.49	18.37		
	15.268	-18.12	14.803	-15.38	18.073	-25.55	15.708	-19.94	19.366	-22.47	11.419	5.76	23.336	-5.14	21.601	-14.66	17.974	-17.54	3.49882	13
15	5.09	17.52	6.37	15.38	10.55	17.48	7.49	16.01	11.39	19.20	0.60	14.06	13.50	1.05	12.60	22.24	9.41	18.29		
	15.404	-18.64	15.013	-16.53	18.249	-25.56	15.807	-20.27	19.391	-22.42	11.429	5.71	23.334	-5.15	21.602	-14.66	17.979	-17.55	3.63025	15
17	5.12	17.50	6.49	15.36	10.57	17.51	7.49	15.57	11.32	19.14	0.53	13.59	13.42	0.57	12.52	22.16	9.33	18.21		
	15.542	-19.13	15.224	-17.62	18.426	-25.53	15.906	-20.60	19.417	-22.37	11.438	5.65	23.333	-5.16	21.603	-14.65	17.983	-17.56	3.76167	17
19	5.15	17.48	7.00	15.34	10.59	17.54	7.50	15.53	11.25	19.09	0.46	13.51	13.34	0.49	12.44	22.08	9.26	18.14		
	15.681	-19.60	15.437	-18.66	18.601	-25.44	16.006	-20.91	19.443	-22.32	11.447	5.60	23.332	-5.16	21.605	-14.65	17.987	-17.56	3.89309	19
21	5.18	17.46	7.12	15.33	11.01	17.58	7.50	15.49	11.19	19.03	0.39	13.44	13.26	0.41	12.37	22.00	9.18	18.06		
	15.820	-20.05	15.651	-19.64	18.777	-25.31	16.106	-21.20	19.469	-22.27	11.456	5.55	23.331	-5.17	21.606	-14.64	17.992	-17.57	4.02451	21
23	5.20	17.44	7.23	15.31	11.02	18.02	7.50	15.45	11.12	18.57	0.32	13.36	13.19	0.33	12.29	21.53	9.11	17.58		
	15.961	-20.47	15.867	-20.55	18.951	-25.13	16.207	-21.49	19.496	-22.21	11.465	5.51	23.331	-5.17	21.607	-14.63	17.996	-17.58	4.15593	23
25	5.23	17.43	7.34	15.31	11.02	18.06	7.50	15.41	11.05	18.51	0.24	13.28	13.11	0.25	12.21	21.45	9.03	17.51		
	16.102	-20.86	16.085	-21.40	19.125	-24.90	16.309	-21.76	19.524	-22.16	11.473	5.46	23.330	-5.17	21.609	-14.63	18.001	-17.58	4.28735	25
27	5.26	17.42	7.45	15.30	11.03	18.11	7.50	15.38	10.59	18.45	0.17	13.21	13.03	0.17	12.13	21.37	8.56	17.43		
	16.244	-21.23	16.305	-22.18	19.297	-24.63	16.411	-22.02	19.551	-22.10	11.481	5.42	23.330	-5.17	21.611	-14.62	18.006	-17.59	4.41877	27
29	5.28	17.41	7.55	15.31	11.02	18.16	7.50	15.34	10.52	18.39	0.10	13.13	12.55	0.09	12.05	21.30	8.48	17.36		
	16.387	-21.58	16.526	-22.88	19.468	-24.31	16.514	-22.26	19.580	-22.04	11.488	5.39	23.330	-5.17	21.613	-14.61	18.010	-17.59	4.55019	29

GRUDZIEŃ 2008

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°/′	j astr	h.mmss	°/′	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2454																		
336	1	Pon	802	16.56575	10.51	16.3152	-21.54	0.98599	19.2848	-23.42	63.537	3.8	12	737	1134.9	1532	1055	1436.9	1826	1249	1
337	2	Wto	803	17.00540	10.28	16.3611	-22.03	0.98583	20.1812	-20.28	63.234	4.8	19	739	1135.3	1532	1117	1523.6	1940	1245	2
338	3	Śro	804	17.04506	10.04	16.4032	-22.11	0.98567	21.0546	-16.21	62.776	5.8	27	740	1135.7	1531	1133	1608.3	2055	1241	3
339	4	Czw	805	17.08471	9.40	16.4452	-22.19	0.98551	21.5155	-11.31	62.160	6.8	36	741	1136.1	1530	1147	1651.6	2210	1237	4
340	5	Pią	806	17.12437	9.15	16.4914	-22.27	0.98536	22.3723	-6.08	61.395	7.8	46	743	1136.5	1530	1158	1734.3	2325	1233	5
341	6	Sob	807	17.16402	8.50	16.5336	-22.34	0.98522	23.2308	-0.22	60.506	0.6	56	744	1136.9	1530	1209	1817.6	****	1229	6
342	7	Nie	808	17.20368	8.24	16.5758	-22.40	0.98508	0.1017	5.37	59.535	1.6	66	745	1137.3	1529	1221	1902.9	043	1225	7
343	8	Pon	809	17.24333	7.58	17.0221	-22.47	0.98494	1.0006	11.32	58.544	2.6	76	746	1137.8	1529	1234	1951.4	205	1221	8
344	9	Wto	810	17.28299	7.31	17.0644	-22.53	0.98481	1.5350	17.04	57.609	3.6	85	748	1138.2	1529	1251	2044.7	331	1217	9
345	10	Śro	811	17.32265	7.04	17.1108	-22.58	0.98469	2.5228	21.49	56.812	4.6	93	749	1138.7	1528	1314	2143.7	502	1214	10
346	11	Czw	812	17.36230	6.37	17.1532	-23.03	0.98457	3.5609	25.15	56.234	5.6	98	750	1139.1	1528	1349	2248.1	635	1210	11
347	12	Pią	813	17.40196	6.09	17.1956	-23.07	0.98445	5.0339	26.55	55.937	6.6	100	751	1139.6	1528	1442	2355.6	800	1206	12
348	13	Sob	814	17.44161	5.40	17.2421	-23.11	0.98435	6.1217	26.32	55.954	0.8	99	752	1140.1	1528	1556	*****	907	1202	13
349	14	Nie	815	17.48127	5.12	17.2846	-23.15	0.98425	7.1852	24.10	56.280	1.8	95	753	1140.5	1528	1725	102.6	953	1158	14
350	15	Pon	816	17.52093	4.43	17.3312	-23.18	0.98415	8.2107	20.10	56.876	2.8	89	754	1141.0	1528	1859	205.6	1023	1154	15
351	16	Wto	817	17.56059	4.14	17.3737	-23.20	0.98406	9.1817	15.02	57.674	3.8	80	754	1141.5	1528	2029	303.0	1044	1150	16
352	17	Śro	818	18.00024	3.45	17.4203	-23.23	0.98398	10.1055	9.14	58.595	4.8	71	755	1142.0	1529	2155	355.0	1059	1146	17
353	18	Czw	819	18.03589	3.15	17.4629	-23.24	0.98390	11.0006	3.11	59.557	5.8	60	756	1142.5	1529	2316	442.7	1112	1142	18
354	19	Pią	820	18.07555	2.46	17.5055	-23.25	0.98383	11.4709	-2.48	60.491	0.0	50	757	1143.0	1529	****	527.7	1123	1138	19
355	20	Sob	821	18.11521	2.16	17.5522	-23.26	0.98377	12.3315	-8.30	61.344	1.0	40	757	1143.5	1530	033	611.2	1134	1134	20
356	21	Nie	822	18.15486	1.46	17.5948	-23.26	0.98370	13.1930	-13.44	62.081	2.0	30	758	1144.0	1530	150	654.7	1147	1130	21
357	22	Pon	823	18.19452	1.16	18.0414	-23.26	0.98365	14.0646	-18.19	62.681	3.0	21	758	1144.5	1531	306	739.1	1202	1126	22
358	23	Wto	824	18.23417	0.46	18.0841	-23.25	0.98360	14.5537	-22.05	63.141	4.0	14	759	1145.0	1531	421	825.2	1221	1122	23
359	24	Śro	825	18.27383	0.16	18.1307	-23.24	0.98355	15.4615	-24.52	63.465	5.0	8	759	1145.5	1532	534	913.2	1246	1118	24
360	25	Czw	826	18.31348	-0.14	18.1734	-23.23	0.98350	16.3825	-26.33	63.662	6.0	4	759	1146.0	1533	641	1002.9	1321	1115	25
361	26	Pią	827	18.35314	-0.43	18.2200	-23.21	0.98346	17.3124	-27.01	63.744	7.0	1	800	1146.5	1534	739	1053.7	1409	1111	26
362	27	Sob	828	18.39280	-1.13	18.2626	-23.18	0.98342	18.2415	-26.15	63.723	8.0	0	800	1147.0	1534	824	1144.2	1508	1107	27
363	28	Nie	829	18.43245	-1.43	18.3052	-23.15	0.98339	19.1560	-24.17	63.602	0.9	1	800	1147.5	1535	858	1233.7	1616	1103	28
364	29	Pon	830	18.47211	-2.12	18.3518	-23.11	0.98336	20.0559	-21.15	63.384	1.9	3	800	1147.9	1536	922	1321.2	1729	1059	29
365	30	Wto	831	18.51177	-2.41	18.3944	-23.08	0.98334	20.5401	-17.18	63.064	2.9	8	800	1148.4	1537	940	1406.5	1844	1055	30
366	31	Śro	832	18.55142	-3.10	18.4409	-23.03	0.98331	21.4018	-12.37	62.637	3.9	13	800	1148.9	1538	954	1450.0	1959	1051	31

Fazy Księżyca [Dm, h.mm]: 1kw 5, 22.26 Pełn 12, 17.37 3kw 19, 11.29 Nów 27, 13.22

GRUDZIEŃ 2008 (c.d.)

Świty, zmiernicy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	5.31	17.40	8.06	15.31	11.02	18.21	7.50	15.31	10.45	18.34	0.03	13.06	12.47	0.02	11.57	21.22	8.41	17.28		
	16.531	-21.89	16.749	-23.50	19.638	-23.94	16.618	-22.50	19.608	-21.97	11.495	5.35	23.330	-5.16	21.615	-14.60	18.015	-17.60	4.68162	1
3	5.33	17.39	8.15	15.33	11.01	18.26	7.50	15.28	10.39	18.28	23.52	12.58	12.39	23.50	11.50	21.14	8.33	17.20		
	16.675	-22.18	16.974	-24.05	19.807	-23.53	16.722	-22.71	19.637	-21.91	11.502	5.32	23.331	-5.16	21.617	-14.59	18.020	-17.60	4.81304	3
5	5.35	17.38	8.25	15.35	10.60	18.32	7.50	15.25	10.32	18.22	23.44	12.50	12.31	23.42	11.42	21.07	8.26	17.13		
	16.820	-22.44	17.201	-24.51	19.973	-23.08	16.826	-22.92	19.666	-21.84	11.508	5.29	23.332	-5.15	21.619	-14.57	18.025	-17.61	4.94446	5
7	5.37	17.38	8.34	15.38	10.58	18.37	7.50	15.22	10.26	18.17	23.37	12.43	12.24	23.34	11.34	20.59	8.18	17.05		
	16.966	-22.67	17.429	-24.89	20.138	-22.59	16.932	-23.10	19.696	-21.77	11.514	5.26	23.333	-5.15	21.622	-14.56	18.030	-17.61	5.07588	7
9	5.39	17.38	8.42	15.41	10.56	18.43	7.50	15.19	10.19	18.11	23.29	12.35	12.16	23.26	11.26	20.51	8.10	16.58		
	17.112	-22.88	17.659	-25.18	20.302	-22.06	17.037	-23.27	19.725	-21.70	11.519	5.23	23.334	-5.14	21.624	-14.55	18.035	-17.62	5.20730	9
11	5.41	17.38	8.49	15.45	10.54	18.49	7.49	15.16	10.12	18.06	23.22	12.27	12.08	23.19	11.19	20.44	8.03	16.50		
	17.259	-23.05	17.889	-25.38	20.463	-21.49	17.144	-23.43	19.756	-21.63	11.524	5.21	23.335	-5.13	21.627	-14.54	18.040	-17.62	5.33872	11
13	5.43	17.38	8.56	15.51	10.51	18.55	7.49	15.14	10.06	18.00	23.14	12.20	11.60	23.11	11.11	20.36	7.55	16.42		
	17.406	-23.19	18.120	-25.48	20.622	-20.88	17.250	-23.57	19.786	-21.56	11.529	5.19	23.336	-5.12	21.630	-14.52	18.045	-17.63	5.47014	13
15	5.44	17.38	9.02	15.57	10.48	19.01	7.49	15.11	9.59	17.55	23.07	12.12	11.52	23.03	11.03	20.28	7.48	16.35		
	17.553	-23.30	18.351	-25.49	20.780	-20.24	17.357	-23.70	19.816	-21.48	11.533	5.18	23.338	-5.10	21.633	-14.51	18.050	-17.63	5.60157	15
17	5.46	17.39	9.07	16.03	10.45	19.07	7.48	15.09	9.53	17.49	22.59	12.04	11.44	22.56	10.55	20.21	7.40	16.27		
	17.701	-23.38	18.582	-25.39	20.935	-19.56	17.465	-23.81	19.847	-21.40	11.536	5.16	23.340	-5.09	21.636	-14.49	18.055	-17.63	5.73299	17
19	5.47	17.40	9.12	16.11	10.42	19.13	7.47	15.07	9.46	17.44	22.52	11.56	11.37	22.48	10.47	20.13	7.33	16.20		
	17.849	-23.42	18.811	-25.20	21.088	-18.86	17.573	-23.90	19.878	-21.32	11.540	5.15	23.342	-5.07	21.639	-14.48	18.060	-17.64	5.86441	19
21	5.48	17.41	9.15	16.19	10.38	19.19	7.46	15.05	9.40	17.38	22.44	11.49	11.29	22.40	10.40	20.06	7.25	16.12		
	17.997	-23.44	19.038	-24.91	21.239	-18.12	17.681	-23.98	19.910	-21.24	11.542	5.14	23.345	-5.06	21.643	-14.46	18.065	-17.64	5.99583	21
23	5.49	17.42	9.17	16.27	10.34	19.25	7.46	15.03	9.33	17.33	22.36	11.41	11.21	22.33	10.32	19.58	7.18	16.04		
	18.145	-23.42	19.262	-24.52	21.388	-17.36	17.790	-24.03	19.941	-21.15	11.545	5.14	23.347	-5.04	21.646	-14.44	18.071	-17.64	6.12725	23
25	5.50	17.43	9.19	16.36	10.30	19.31	7.45	15.01	9.26	17.28	22.29	11.33	11.13	22.25	10.24	19.51	7.10	15.57		
	18.293	-23.38	19.481	-24.02	21.534	-16.57	17.899	-24.08	19.973	-21.07	11.547	5.14	23.350	-5.02	21.650	-14.42	18.076	-17.64	6.25867	25
27	5.51	17.44	9.19	16.46	10.26	19.36	7.43	14.60	9.20	17.22	22.21	11.25	11.05	22.18	10.16	19.43	7.03	15.49		
	18.441	-23.30	19.693	-23.44	21.679	-15.75	18.008	-24.10	20.004	-20.98	11.548	5.14	23.353	-5.00	21.653	-14.41	18.081	-17.65	6.39009	27
29	5.51	17.46	9.18	16.55	10.22	19.42	7.42	14.59	9.13	17.17	22.13	11.18	10.58	22.10	10.09	19.36	6.55	15.42		
	18.588	-23.19	19.895	-22.76	21.821	-14.91	18.118	-24.11	20.036	-20.89	11.549	5.14	23.356	-4.98	21.657	-14.39	18.086	-17.65	6.52152	29
31	5.51	17.48	9.16	17.04	10.17	19.48	7.41	14.57	9.07	17.12	22.05	11.10	10.50	22.02	10.01	19.28	6.47	15.34		
	18.736	-23.05	20.084	-22.01	21.961	-14.06	18.228	-24.10	20.068	-20.80	11.550	5.15	23.359	-4.96	21.661	-14.37	18.091	-17.65	6.65294	31

Święta państwowe i kościelne w Polsce oraz inne ważniejsze dni w roku 2008

Nowy Rok	Wto	1 styczeń	Trójcy Najświętszej	Nie	18 maj
Najświętszej Maryi Panny Rodzicielki	Wto	1 styczeń	Boże Ciało	Czw	22 maj
Objawienia Pańskiego (Trzech Króli)	Nie	6 styczeń	Dzień Matki	Pon	26 maj
Juliański Nowy Rok	Pon	14 styczeń	Najświętszego Serca Pana Jezusa	Pią	30 maj
Dzień Babci	Pon	21 styczeń	Dzień Dziecka	Nie	1 czerwiec
Dzień Dziadka	Wto	22 styczeń	Dzień Dziękczynienia	Nie	1 czerwiec
Thusty czwartek	Czw	31 styczeń	Dzień Ojca	Pon	23 czerwiec
Ofiarowania Pańskiego	Sob	2 luty	Noc Świętojańska	Pon	23 czerwiec
Matki Boskiej Gromnicznej	Sob	2 luty	Św. Piotra i Pawła	Nie	29 czerwiec
Środa Popielcowa	Śro	6 luty	Wniebowzięcia N.M.P.	Pią	15 sierpień
Walentynki	Czw	14 luty	Święto Wojska Polskiego	Pią	15 sierpień
Święto UMK	Wto	19 luty	Dzień Solidarności i Wolności	Nie	31 sierpień
Dzień Kobiet	Sob	8 marzec	Dzień Programisty	Sob	13 wrzesień
Niedziela Palmowa	Nie	16 marzec	Dożynki – Święto Plonów	Wto	23 wrzesień
Niedziela Wielkanocna	Nie	23 marzec	Dzień Papieski	Nie	12 październik
Narodowy Dzień Życia	Pon	24 marzec	Dzień Edukacji Narodowej	Wto	14 październik
Niedziela Miłosierdzia Bożego	Nie	30 marzec	Dzień Papieża Jana Pawła II	Czw	16 październik
Wniebowstąpienia Pańskiego	Czw	1 maj	Wszystkich Świętych	Sob	1 listopad
Święto Pracy	Czw	1 maj	Zaduszki	Nie	2 listopad
Dzień Flagi Rzeczypospolitej Polskiej	Pią	2 maj	Święto Niepodległości	Wto	11 listopad
Najświętsza Maryja Królowa Polski	Sob	3 maj	Pierwsza niedziela Adwentu	Nie	30 listopad
Święto Konstytucji 3 Maja	Sob	3 maj	Niepokalane Poczęcie N.M.P.	Pon	8 grudzień
Zesłania Ducha Świętego	Nie	11 maj	Boże Narodzenie	Czw	25 grudzień
Dzień Polskiej Niezapominajki	Czw	15 maj	Sylwester	Śro	31 grudzień

Kalendarz astronomiczny 2009

PIWNICE, CA UMK

Współrzędne geograficzne: 18.5641°E 53.0955°N, Nr strefy czasowej (> 0 , gdy na wschód) = 1 (CSE)

Kalendarz jest gregoriańskim i jest oparty na efemerydach Układu Słonecznego obliczanych z dokładnością 1' (Słońce 2", Księżyc 10", Pluton 15'). Czas gwiazdowy ma dokładność około 0.1 s. Wschody i zachody obliczono z uwzględnieniem horyzontalnej refrakcji astronomicznej (34'), rozciągłości Słońca lub Księżyca i paralaksy horyzontalnej Księżyca. Dla dat odległych o więcej niż ok. 300 lat od roku 1950 dokładności położenia planet są gorsze niż 1'!
(Kalendarz ten opracowano [KMB] w Katedrze Radioastronomii CA UMK, Toruń—Piwnice. Oblicz. dnia 7.10.2010 r.)

Data Wielkanocy: **2009 KWIECIEŃ 12**

Dla całego roku przyjęto: TDT – UT = 66 s

Pory roku [miesiąc dzień, godz. mm] (czas zimowy): Wiosna **III 20, 12.44**, Lato **VI 21, 6.46**, Jesień **IX 22, 22.19**, Zima **XII 21, 18.47**

Dane w czasie letnim odróżniono kolorem brązowym; czas ten obowiązuje **od 29 marca do 25 października 2009 r.**

Oznaczenia:

Dr — dzień 2009 roku (1 stycznia Dr = 1)

Dm — dzień miesiąca

Dt — dzień tygodnia

JD — data juliańska modulo 1000 o 12^h UT

(po nagłówku: Entier(JD/1000) dla Dm = 1)

ST — prawdziwy czas gwiazdowy

$\Delta\alpha$ — różnica czasu (czas słoneczny prawdziwy minus średni)

α — rektascensja (Słońca lub Księżyca)

δ — deklinacja (Słońca lub Księżyca)

R — odległość (Słońca lub Księżyca)

j astr — jednostka astronomiczna

ρ_{\oplus} — promień Ziemi

Faza \leftarrow dni po kwadrze i % oświetlonej części tarczy Księżyca

Wsch — wschód (Słońca, Księżyca lub planety)

Gór — górowanie czyli tranzyt (Gal. = centrum Galaktyki)

Zach — zachód (Słońca, Księżyca lub planety)

STYCZEŃ 2009

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]									
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°/′	j astr	h.mmss	°/′	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2454																			
1	1	Czw	833	18.59108	-3.38	18.4834	-22.58	0.98330	22.2526	-7.24	62.097	4.9	21	800	1149.4	1539	1006	1532.3	2113	1047	1	
2	2	Pią	834	19.03073	-4.06	18.5259	-22.53	0.98328	23.1015	-1.48	61.444	5.9	29	800	1149.8	1540	1017	1614.4	2228	1043	2	
3	3	Sob	835	19.07039	-4.34	18.5723	-22.47	0.98327	23.5546	3.60	60.687	6.9	39	759	1150.3	1542	1028	1657.5	2346	1039	3	
4	4	Nie	836	19.11004	-5.01	19.0147	-22.41	0.98327	0.4307	9.47	59.846	7.9	50	759	1150.8	1543	1039	1742.9	****	1035	4	
5	5	Pon	837	19.14570	-5.28	19.0610	-22.34	0.98327	1.3333	15.17	58.959	1.0	60	759	1151.2	1544	1054	1832.0		107	1031	5
6	6	Wto	838	19.18535	-5.54	19.1033	-22.27	0.98328	2.2812	20.11	58.080	2.0	71	758	1151.7	1545	1113	1926.1	232	1027	6	
7	7	Śro	839	19.22501	-6.20	19.1456	-22.19	0.98329	3.2749	24.03	57.278	3.0	81	758	1152.1	1547	1140	2025.7	402	1023	7	
8	8	Czw	840	19.26467	-6.46	19.1918	-22.11	0.98331	4.3207	26.28	56.627	4.0	89	757	1152.5	1548	1222	2130.3	529	1020	8	
9	9	Pią	841	19.30432	-7.11	19.2339	-22.03	0.98334	5.3929	27.01	56.200	5.0	96	757	1152.9	1550	1324	2237.1	644	1016	9	
10	10	Sob	842	19.34398	-7.35	19.2760	-21.54	0.98337	6.4705	25.32	56.051	6.0	99	756	1153.3	1551	1446	2342.7	741	1012	10	
11	11	Nie	843	19.38363	-7.59	19.3220	-21.45	0.98341	7.5205	22.12	56.206	0.3	100	755	1153.7	1553	1619	*****	819	1008	11	
12	12	Pon	844	19.42329	-8.22	19.3640	-21.35	0.98345	8.5247	17.24	56.656	1.3	97	754	1154.1	1554	1755	044.3	845	1004	12	
13	13	Wto	845	19.46295	-8.44	19.4059	-21.25	0.98351	9.4853	11.39	57.357	2.3	92	754	1154.5	1556	1926	140.5	903	1000	13	
14	14	Śro	846	19.50260	-9.06	19.4517	-21.14	0.98356	10.4103	5.27	58.240	3.3	85	753	1154.8	1557	2052	232.0	917	956	14	
15	15	Czw	847	19.54226	-9.27	19.4935	-21.03	0.98363	11.3025	-0.49	59.221	4.3	76	752	1155.2	1559	2214	319.9	930	952	15	
16	16	Pią	848	19.58191	-9.48	19.5352	-20.52	0.98370	12.1813	-6.50	60.218	5.3	67	751	1155.5	1601	2334	405.6	941	948	16	
17	17	Sob	849	20.02157	-10.08	19.5809	-20.40	0.98377	13.0532	-12.22	61.158	6.3	57	750	1155.9	1602	****	450.4	953	944	17	
18	18	Nie	850	20.06122	-10.27	20.0225	-20.28	0.98385	13.5320	-17.14	61.985	0.3	47	749	1156.2	1604	052	535.4	1008	940	18	
19	19	Pon	851	20.10088	-10.45	20.0640	-20.15	0.98394	14.4216	-21.16	62.661	1.3	37	748	1156.5	1606	208	621.5	1025	936	19	
20	20	Wto	852	20.14054	-11.03	20.1054	-20.02	0.98403	15.3242	-24.20	63.165	2.3	28	747	1156.8	1608	323	709.2	1048	932	20	
21	21	Śro	853	20.18019	-11.20	20.1507	-19.49	0.98412	16.2434	-26.18	63.493	3.3	20	745	1157.1	1609	433	758.5	1120	928	21	
22	22	Czw	854	20.21585	-11.37	20.1920	-19.35	0.98422	17.1722	-27.04	63.652	4.3	13	744	1157.4	1611	534	848.9	1203	924	22	
23	23	Pią	855	20.25550	-11.52	20.2332	-19.21	0.98432	18.1017	-26.36	63.659	5.3	7	743	1157.6	1613	623	939.7	1259	921	23	
24	24	Sob	856	20.29516	-12.07	20.2744	-19.07	0.98443	19.0226	-24.56	63.538	6.3	3	742	1157.9	1615	700	1029.6	1405	917	24	
25	25	Nie	857	20.33482	-12.21	20.3154	-18.52	0.98454	19.5306	-22.08	63.310	7.3	1	740	1158.1	1617	727	1118.0	1517	913	25	
26	26	Pon	858	20.37447	-12.34	20.3604	-18.37	0.98465	20.4156	-18.22	62.995	0.1	0	739	1158.3	1619	747	1204.4	1632	909	26	
27	27	Wto	859	20.41413	-12.46	20.4013	-18.22	0.98477	21.2860	-13.49	62.610	1.1	1	737	1158.5	1620	802	1248.8	1748	905	27	
28	28	Śro	860	20.45378	-12.58	20.4421	-18.06	0.98489	22.1442	-8.39	62.165	2.1	4	736	1158.7	1622	815	1331.7	1903	901	28	
29	29	Czw	861	20.49344	-13.09	20.4828	-17.50	0.98501	22.5945	-3.05	61.665	3.1	9	734	1158.9	1624	826	1414.0	2018	857	29	
30	30	Pią	862	20.53309	-13.19	20.5235	-17.33	0.98514	23.4500	2.42	61.111	4.1	16	733	1159.1	1626	837	1456.7	2134	853	30	
31	31	Sob	863	20.57275	-13.28	20.5640	-17.17	0.98527	0.3129	8.27	60.507	5.1	24	731	1159.2	1628	848	1540.8	2253	849	31	

Fazy Księżyca [Dm, h.mm]: 1kw 4, 12.56 Pełn 11, 4.27 3kw 18, 3.46 Nów 26, 8.55

STYCZEŃ 2009 (c.d.)

Świty, zmiery astronomie ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	5.51	17.49	9.15	17.08	10.15	19.51	7.40	14.57	9.03	17.09	22.01	11.06	10.46	21.59	9.57	19.24	6.44	15.30		
	18.809	-22.97	20.173	-21.62	22.030	-13.62	18.283	-24.09	20.085	-20.75	11.550	5.15	23.361	-4.94	21.663	-14.36	18.093	-17.65	6.71865	1
3	5.51	17.51	9.11	17.16	10.10	19.56	7.38	14.56	8.57	17.04	21.53	10.58	10.38	21.51	9.49	19.17	6.36	15.23		
	18.956	-22.78	20.335	-20.79	22.166	-12.73	18.393	-24.05	20.117	-20.66	11.550	5.16	23.365	-4.92	21.667	-14.34	18.098	-17.65	6.85007	3
5	5.51	17.53	9.05	17.22	10.05	20.01	7.37	14.55	8.50	16.58	21.45	10.50	10.30	21.44	9.42	19.09	6.29	15.15		
	19.103	-22.57	20.472	-19.94	22.300	-11.83	18.503	-24.00	20.149	-20.57	11.549	5.18	23.369	-4.89	21.671	-14.32	18.103	-17.65	6.98149	5
7	5.51	17.55	8.58	17.26	9.59	20.07	7.35	14.54	8.44	16.53	21.37	10.42	10.23	21.36	9.34	19.02	6.21	15.08		
	19.249	-22.32	20.577	-19.10	22.432	-10.92	18.613	-23.93	20.181	-20.47	11.548	5.19	23.373	-4.87	21.675	-14.30	18.108	-17.65	7.11291	7
9	5.50	17.57	8.49	17.27	9.54	20.12	7.33	14.54	8.37	16.48	21.29	10.35	10.15	21.29	9.26	18.54	6.13	15.00		
	19.394	-22.05	20.644	-18.32	22.562	-9.99	18.724	-23.84	20.214	-20.37	11.546	5.21	23.377	-4.84	21.680	-14.28	18.113	-17.66	7.24433	9
11	5.49	17.60	8.38	17.25	9.49	20.17	7.31	14.53	8.30	16.43	21.21	10.27	10.07	21.21	9.18	18.47	6.06	14.53		
	19.539	-21.74	20.664	-17.64	22.689	-9.05	18.834	-23.73	20.247	-20.27	11.545	5.23	23.381	-4.81	21.684	-14.25	18.118	-17.66	7.37576	11
13	5.48	18.02	8.25	17.19	9.43	20.22	7.29	14.53	8.24	16.37	21.13	10.19	9.59	21.14	9.11	18.39	5.58	14.45		
	19.683	-21.41	20.633	-17.12	22.813	-8.10	18.944	-23.61	20.279	-20.17	11.542	5.26	23.386	-4.78	21.688	-14.23	18.123	-17.66	7.50718	13
15	5.47	18.05	8.10	17.08	9.37	20.26	7.26	14.53	8.17	16.32	21.05	10.11	9.51	21.06	9.03	18.32	5.51	14.37		
	19.826	-21.05	20.550	-16.79	22.936	-7.15	19.055	-23.47	20.312	-20.07	11.539	5.29	23.390	-4.75	21.693	-14.21	18.128	-17.66	7.63860	15
17	5.46	18.08	7.54	16.53	9.31	20.31	7.24	14.53	8.11	16.27	20.57	10.03	9.44	20.59	8.55	18.24	5.43	14.30		
	19.969	-20.67	20.419	-16.66	23.055	-6.19	19.165	-23.31	20.344	-19.96	11.536	5.32	23.395	-4.72	21.697	-14.19	18.133	-17.66	7.77002	17
19	5.44	18.10	7.36	16.35	9.25	20.35	7.21	14.53	8.04	16.22	20.48	9.55	9.36	20.52	8.47	18.17	5.36	14.22		
	20.111	-20.25	20.255	-16.72	23.173	-5.23	19.275	-23.14	20.377	-19.85	11.532	5.35	23.400	-4.69	21.702	-14.16	18.137	-17.66	7.90143	19
21	5.42	18.13	7.19	16.15	9.19	20.39	7.19	14.53	7.57	16.17	20.40	9.47	9.28	20.44	8.40	18.10	5.28	14.15		
	20.252	-19.82	20.075	-16.94	23.287	-4.27	19.385	-22.94	20.410	-19.75	11.528	5.39	23.405	-4.65	21.706	-14.14	18.142	-17.65	8.03286	21
23	5.41	18.16	7.03	15.55	9.13	20.43	7.16	14.53	7.51	16.11	20.32	9.39	9.21	20.37	8.32	18.02	5.20	14.07		
	20.392	-19.35	19.902	-17.27	23.399	-3.31	19.495	-22.73	20.442	-19.64	11.524	5.42	23.410	-4.62	21.711	-14.12	18.146	-17.65	8.16428	23
25	5.39	18.19	6.49	15.35	9.06	20.47	7.13	14.53	7.44	16.06	20.23	9.31	9.13	20.30	8.24	17.55	5.13	13.59		
	20.532	-18.87	19.754	-17.66	23.509	-2.35	19.605	-22.51	20.475	-19.53	11.519	5.46	23.416	-4.58	21.716	-14.09	18.151	-17.65	8.29570	25
27	5.36	18.22	6.37	15.18	8.60	20.51	7.10	14.54	7.37	16.01	20.15	9.23	9.05	20.22	8.17	17.47	5.05	13.52		
	20.670	-18.36	19.641	-18.07	23.615	-1.39	19.714	-22.26	20.507	-19.42	11.514	5.51	23.421	-4.55	21.721	-14.07	18.155	-17.65	8.42712	27
29	5.34	18.26	6.27	15.03	8.53	20.54	7.07	14.54	7.31	15.56	20.06	9.15	8.57	20.15	8.09	17.40	4.58	13.44		
	20.808	-17.83	19.568	-18.48	23.719	-0.44	19.823	-22.00	20.540	-19.30	11.508	5.55	23.427	-4.51	21.726	-14.05	18.159	-17.65	8.55854	29
31	5.31	18.29	6.20	14.51	8.46	20.57	7.03	14.55	7.24	15.51	19.58	9.07	8.50	20.08	8.01	17.32	4.50	13.37		
	20.945	-17.28	19.537	-18.86	23.819	0.50	19.932	-21.73	20.572	-19.19	11.502	5.60	23.433	-4.47	21.730	-14.02	18.164	-17.65	8.68996	31

LUTY 2009

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)											Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2454																			
32	1	Nie	864	21.01240	-13.36	21.0045	-16.59	0.98540	1.2015	13.58	59.858	6.1	34	729	1159.3	1630	901	1627.6	****	845	1	
33	2	Pon	865	21.05206	-13.43	21.0449	-16.42	0.98554	2.1221	18.56	59.181	7.1	44	728	1159.5	1632	917	1718.2	015	841	2	
34	3	Wto	866	21.09171	-13.50	21.0852	-16.25	0.98568	3.0837	23.01	58.502	0.5	55	726	1159.6	1634	940	1813.7	141	837	3	
35	4	Śro	867	21.13137	-13.56	21.1255	-16.07	0.98583	4.0911	25.51	57.861	1.5	67	724	1159.7	1636	1014	1913.8	306	833	4	
36	5	Czw	868	21.17103	-14.01	21.1656	-15.48	0.98598	5.1315	27.04	57.309	2.5	77	723	1159.8	1638	1104	2017.4	425	829	5	
37	6	Pią	869	21.21068	-14.05	21.2057	-15.30	0.98614	6.1850	26.25	56.902	3.5	86	721	1159.8	1640	1214	2121.7	528	825	6	
38	7	Sob	870	21.25034	-14.08	21.2457	-15.11	0.98630	7.2331	23.54	56.694	4.5	93	719	1159.9	1642	1341	2224.0	614	822	7	
39	8	Nie	871	21.28600	-14.10	21.2856	-14.52	0.98647	8.2516	19.46	56.725	5.5	98	717	1159.9	1644	1515	2322.4	644	818	8	
40	9	Pon	872	21.32565	-14.12	21.3254	-14.33	0.98664	9.2313	14.25	57.009	6.5	100	715	1159.9	1646	1649	*****	706	814	9	
41	10	Wto	873	21.36530	-14.13	21.3651	-14.14	0.98682	10.1730	8.19	57.535	0.8	99	713	1160.0	1647	1819	016.5	722	810	10	
42	11	Śro	874	21.40496	-14.13	21.4048	-13.54	0.98700	11.0854	1.56	58.261	1.8	95	711	1160.0	1649	1945	106.9	735	806	11	
43	12	Czw	875	21.44462	-14.12	21.4444	-13.34	0.98719	11.5828	-4.23	59.124	2.8	90	709	1160.0	1651	2108	154.7	747	802	12	
44	13	Pią	876	21.48427	-14.11	21.4839	-13.14	0.98739	12.4714	-10.17	60.051	3.8	82	707	1159.9	1653	2229	241.2	800	758	13	
45	14	Sob	877	21.52393	-14.09	21.5233	-12.53	0.98759	13.3606	-15.34	60.966	4.8	73	705	1159.9	1655	2348	327.5	813	754	14	
46	15	Nie	878	21.56358	-14.06	21.5627	-12.33	0.98779	14.2547	-20.00	61.802	5.8	64	703	1159.8	1657	****	414.3	830	750	15	
47	16	Pon	879	22.00324	-14.03	22.0020	-12.12	0.98800	15.1638	-23.28	62.503	6.8	54	701	1159.8	1659	106	502.4	851	746	16	
48	17	Wto	880	22.04289	-13.58	22.0413	-11.51	0.98821	16.0842	-25.48	63.033	0.6	45	659	1159.7	1701	219	551.9	919	742	17	
49	18	Śro	881	22.08255	-13.54	22.0804	-11.30	0.98842	17.0135	-26.57	63.371	1.6	35	657	1159.6	1703	325	642.4	958	738	18	
50	19	Czw	882	22.12220	-13.48	22.1155	-11.09	0.98864	17.5438	-26.51	63.513	2.6	27	655	1159.5	1705	419	733.3	1049	734	19	
51	20	Pią	883	22.16186	-13.42	22.1546	-10.47	0.98886	18.4702	-25.32	63.469	3.6	19	653	1159.4	1707	500	823.6	1152	730	20	
52	21	Sob	884	22.20152	-13.35	22.1935	-10.25	0.98908	19.3808	-23.04	63.262	4.6	12	651	1159.3	1709	530	912.5	1302	727	21	
53	22	Nie	885	22.24117	-13.27	22.2324	-10.03	0.98931	20.2735	-19.35	62.923	5.6	6	649	1159.2	1711	553	959.7	1416	723	22	
54	23	Pon	886	22.28083	-13.19	22.2713	-9.41	0.98954	21.1522	-15.13	62.486	6.6	3	646	1159.1	1713	610	1045.0	1532	719	23	
55	24	Wto	887	22.32048	-13.11	22.3101	-9.19	0.98977	22.0151	-10.11	61.986	7.6	0	644	1158.9	1715	623	1128.9	1648	715	24	
56	25	Śro	888	22.36014	-13.01	22.3448	-8.57	0.99000	22.4737	-4.39	61.455	0.4	0	642	1158.8	1717	635	1212.0	1804	711	25	
57	26	Czw	889	22.39579	-12.52	22.3835	-8.35	0.99023	23.3325	1.10	60.918	1.4	2	640	1158.6	1718	646	1255.1	1922	707	26	
58	27	Pią	890	22.43545	-12.41	22.4221	-8.12	0.99046	0.2012	7.01	60.393	2.4	6	637	1158.4	1720	657	1339.4	2041	703	27	
59	28	Sob	891	22.47510	-12.30	22.4607	-7.49	0.99070	1.0853	12.40	59.888	3.4	12	635	1158.3	1722	710	1425.8	2203	659	28	

Fazy Księżyca [Dm, h.mm]: 1kw 3, 0.13 Pełn 9, 15.49 3kw 16, 22.37 Now 25, 2.35

LUTY 2009 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST (0^h UT) Dm	
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach		
1	5.30	18.30	6.17	14.46	8.43	20.59	7.02	14.55	7.21	15.48	19.54	9.03	8.46	20.04	7.57	17.29	4.46	13.33		
	21.013	-16.99	19.536	-19.03	23.868	0.96	19.987	-21.58	20.588	-19.13	11.499	5.62	23.435	-4.45	21.733	-14.01	18.166	-17.65	8.75567	1
3	5.27	18.34	6.13	14.37	8.36	21.01	6.58	14.56	7.14	15.43	19.45	8.55	8.38	19.57	7.50	17.21	4.39	13.25		
	21.148	-16.41	19.560	-19.35	23.963	1.88	20.095	-21.28	20.621	-19.02	11.492	5.67	23.441	-4.41	21.738	-13.98	18.170	-17.65	8.88709	3
5	5.24	18.37	6.10	14.31	8.29	21.04	6.54	14.57	7.07	15.38	19.37	8.47	8.30	19.49	7.42	17.14	4.31	13.18		
	21.282	-15.81	19.615	-19.61	0.055	2.79	20.204	-20.97	20.653	-18.90	11.485	5.72	23.447	-4.37	21.743	-13.96	18.174	-17.64	9.01851	5
7	5.21	18.40	6.08	14.27	8.21	21.06	6.51	14.58	7.01	15.33	19.28	8.39	8.23	19.42	7.34	17.06	4.23	13.10		
	21.416	-15.19	19.695	-19.80	0.143	3.68	20.311	-20.64	20.685	-18.79	11.478	5.78	23.454	-4.33	21.747	-13.93	18.178	-17.64	9.14993	7
9	5.18	18.44	6.07	14.24	8.14	21.08	6.47	14.59	6.54	15.27	19.19	8.31	8.15	19.35	7.26	16.59	4.16	13.02		
	21.548	-14.55	19.798	-19.93	0.226	4.55	20.419	-20.29	20.717	-18.67	11.471	5.83	23.460	-4.29	21.752	-13.91	18.181	-17.64	9.28135	9
11	5.15	18.47	6.07	14.23	8.06	21.09	6.43	14.60	6.47	15.22	19.11	8.23	8.07	19.27	7.19	16.52	4.08	12.55		
	21.680	-13.90	19.919	-19.98	0.305	5.40	20.526	-19.93	20.749	-18.55	11.463	5.89	23.466	-4.25	21.757	-13.89	18.185	-17.64	9.41277	11
13	5.11	18.51	6.07	14.24	7.58	21.10	6.39	15.01	6.40	15.17	19.02	8.15	7.60	19.20	7.11	16.44	4.00	12.47		
	21.811	-13.23	20.054	-19.95	0.380	6.23	20.633	-19.55	20.780	-18.43	11.455	5.95	23.473	-4.21	21.762	-13.86	18.189	-17.64	9.54419	13
15	5.07	18.54	6.07	14.25	7.50	21.11	6.35	15.02	6.34	15.12	18.53	8.07	7.52	19.13	7.03	16.37	3.53	12.40		
	21.941	-12.55	20.203	-19.84	0.449	7.03	20.739	-19.17	20.812	-18.31	11.446	6.01	23.479	-4.17	21.767	-13.84	18.192	-17.63	9.67561	15
17	5.04	18.58	6.08	14.28	7.42	21.11	6.31	15.03	6.27	15.07	18.45	7.59	7.44	19.06	6.56	16.29	3.45	12.32		
	22.070	-11.85	20.361	-19.65	0.512	7.80	20.845	-18.76	20.843	-18.19	11.438	6.07	23.486	-4.13	21.772	-13.81	18.195	-17.63	9.80703	17
19	4.60	19.01	6.08	14.32	7.33	21.11	6.26	15.04	6.20	15.01	18.36	7.51	7.36	18.59	6.48	16.22	3.37	12.24		
	22.199	-11.14	20.529	-19.38	0.570	8.53	20.951	-18.35	20.874	-18.07	11.429	6.13	23.492	-4.08	21.777	-13.79	18.199	-17.63	9.93845	19
21	4.56	19.05	6.08	14.37	7.24	21.10	6.22	15.05	6.13	14.56	18.27	7.43	7.29	18.51	6.40	16.14	3.30	12.17		
	22.326	-10.42	20.703	-19.02	0.621	9.23	21.056	-17.92	20.905	-17.95	11.420	6.19	23.499	-4.04	21.782	-13.76	18.202	-17.62	10.06987	21
23	4.52	19.09	6.08	14.43	7.16	21.08	6.18	15.07	6.07	14.51	18.19	7.35	7.21	18.44	6.32	16.07	3.22	12.09		
	22.454	-9.69	20.884	-18.58	0.666	9.88	21.161	-17.48	20.936	-17.83	11.411	6.25	23.506	-3.99	21.787	-13.74	18.205	-17.62	10.20129	23
25	4.47	19.12	6.08	14.50	7.06	21.06	6.13	15.08	5.60	14.46	18.10	7.27	7.13	18.37	6.25	15.60	3.14	12.01		
	22.580	-8.95	21.070	-18.05	0.703	10.49	21.265	-17.02	20.966	-17.70	11.402	6.32	23.513	-3.95	21.792	-13.71	18.207	-17.62	10.33271	25
27	4.43	19.16	6.08	14.57	6.57	21.03	6.09	15.09	5.53	14.40	18.01	7.19	7.06	18.30	6.17	15.52	3.06	11.54		
	22.706	-8.20	21.260	-17.43	0.732	11.04	21.369	-16.56	20.997	-17.58	11.392	6.38	23.520	-3.91	21.797	-13.69	18.210	-17.62	10.46412	27

MARZEC 2009

Piwnice, CA UMK				← Dane na godz. 12 czasu strefowego (= 11 lub 10 ^h UT) →										Czas strefowy [hhmm.]							
..... Dzień				ST	Δα	α _☉	δ _☉	R _☉	α _☿	δ _☿	R _☿	Faza ☿	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ _☿	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2454																					
60	1	Nie	892	22.51476	-12.19	22.4952	-7.27	0.99094	2.0025	17.48	59.410	4.4	20	633	1158.1	1724	725	1515.4	2327	655	1
61	2	Pon	893	22.55441	-12.07	22.5336	-7.04	0.99117	2.5530	22.05	58.960	5.4	30	631	1157.9	1726	746	1609.0	****	651	2
62	3	Wto	894	22.59407	-11.54	22.5720	-6.41	0.99142	3.5417	25.12	58.543	6.4	40	628	1157.7	1728	815	1706.8	052	647	3
63	4	Śro	895	23.03372	-11.41	23.0104	-6.18	0.99166	4.5611	26.49	58.171	0.1	52	626	1157.4	1730	858	1807.7	212	643	4
64	5	Czw	896	23.07338	-11.28	23.0447	-5.54	0.99191	5.5939	26.43	57.862	1.1	63	624	1157.2	1732	1000	1909.9	320	639	5
65	6	Pią	897	23.11304	-11.14	23.0830	-5.31	0.99216	7.0240	24.50	57.643	2.1	74	621	1157.0	1734	1118	2010.9	410	635	6
66	7	Sob	898	23.15269	-10.60	23.1212	-5.08	0.99241	8.0329	21.22	57.546	3.1	83	619	1156.7	1735	1247	2109.0	444	631	7
67	8	Nie	899	23.19235	-10.45	23.1554	-4.44	0.99266	9.0108	16.34	57.599	4.1	91	617	1156.5	1737	1418	2203.3	508	628	8
68	9	Pon	900	23.23200	-10.30	23.1935	-4.21	0.99292	9.5536	10.52	57.823	5.1	96	614	1156.2	1739	1547	2254.4	526	624	9
69	10	Wto	901	23.27166	-10.14	23.2316	-3.57	0.99318	10.4726	4.40	58.224	6.1	99	612	1156.0	1741	1714	2342.9	541	620	10
70	11	Śro	902	23.31131	-9.59	23.2657	-3.34	0.99345	11.3732	-1.40	58.788	0.3	100	610	1155.7	1743	1838	*****	553	616	11
71	12	Czw	903	23.35097	-9.43	23.3038	-3.10	0.99372	12.2653	-7.48	59.481	1.3	98	607	1155.5	1745	2001	030.1	606	612	12
72	13	Pią	904	23.39062	-9.26	23.3418	-2.47	0.99399	13.1619	-13.25	60.252	2.3	93	605	1155.2	1746	2122	116.9	619	608	13
73	14	Sob	905	23.43028	-9.10	23.3758	-2.23	0.99426	14.0631	-18.16	61.043	3.3	87	603	1154.9	1748	2242	204.3	634	604	14
74	15	Nie	906	23.46593	-8.53	23.4137	-1.59	0.99454	14.5753	-22.10	61.792	4.3	80	600	1154.6	1750	****	252.8	654	600	15
75	16	Pon	907	23.50559	-8.36	23.4517	-1.36	0.99482	15.5025	-24.58	62.442	5.3	71	558	1154.3	1752	000	342.6	719	556	16
76	17	Wto	908	23.54524	-8.18	23.4856	-1.12	0.99510	16.4344	-26.32	62.944	6.3	62	555	1154.1	1754	109	433.6	754	552	17
77	18	Śro	909	23.58490	-8.01	23.5235	-0.48	0.99539	17.3710	-26.52	63.266	7.3	53	553	1153.8	1756	209	524.9	841	548	18
78	19	Czw	910	0.02456	-7.43	23.5614	-0.24	0.99567	18.2956	-25.56	63.387	0.7	43	551	1153.5	1757	256	615.7	939	544	19
79	20	Pią	911	0.06421	-7.26	23.5953	-0.01	0.99596	19.2123	-23.51	63.306	1.7	34	548	1153.2	1759	330	705.1	1046	540	20
80	21	Sob	912	0.10387	-7.08	0.0332	0.23	0.99624	20.1110	-20.43	63.035	2.7	25	546	1152.9	1801	356	752.8	1159	536	21
81	22	Nie	913	0.14352	-6.50	0.0711	0.47	0.99653	20.5917	-16.41	62.600	3.7	18	543	1152.6	1803	415	838.7	1314	532	22
82	23	Pon	914	0.18318	-6.32	0.1049	1.10	0.99682	21.4605	-11.53	62.041	4.7	11	541	1152.3	1805	429	923.0	1429	529	23
83	24	Wto	915	0.22283	-6.14	0.1428	1.34	0.99711	22.3210	-6.31	61.404	5.7	5	539	1152.0	1806	442	1006.4	1545	525	24
84	25	Śro	916	0.26249	-5.56	0.1806	1.58	0.99739	23.1818	-0.46	60.736	6.7	2	536	1151.7	1808	454	1049.9	1703	521	25
85	26	Czw	917	0.30214	-5.38	0.2145	2.21	0.99768	0.0523	5.09	60.087	7.7	0	534	1151.4	1810	505	1134.2	1822	517	26
86	27	Pią	918	0.34180	-5.20	0.2523	2.45	0.99796	0.5422	10.58	59.496	0.8	1	531	1151.1	1812	517	1220.8	1944	513	27
87	28	Sob	919	0.38145	-5.02	0.2902	3.08	0.99824	1.4609	16.21	58.994	1.8	4	529	1150.8	1814	532	1310.4	2110	509	28
88	29	Nie	920	0.42111	-4.44	0.3240	3.31	0.99853	2.4125	20.57	58.597	2.8	9	527	1150.5	1815	552	1403.9	2237	505	29
88	29	Nie	920	23.42012	-4.45	0.3231	3.31	0.99852	2.3902	20.47	58.611	3.8	9	627	1250.5	1915	652	1503.9	2337	605	29
89	30	Pon	921	23.45578	-4.27	0.3610	3.54	0.99880	3.3747	24.18	58.318	4.8	17	624	1250.2	1917	719	1601.4	****	601	30
90	31	Wto	922	23.49543	-4.09	0.3948	4.17	0.99908	4.3933	26.21	58.128	5.8	26	622	1249.9	1919	758	1702.1	100	557	31

Fazy Księżyca [Dm, h.mm]: 1kw 4, 8.46 Pełn 11, 3.38 3kw 18, 18.47 Nów 26, 17.06

MARZEC 2009 (c.d.)

Świty, zmierychy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.38	19.20	6.07	15.05	6.48	20.60	6.04	15.10	5.46	14.35	17.52	7.11	6.58	18.22	6.09	15.45	2.59	11.46		
	22.831	-7.44	21.454	-16.73	0.753	11.54	21.472	-16.08	21.027	-17.46	11.383	6.45	23.526	-3.86	21.801	-13.66	18.213	-17.61	10.59554	1
3	4.34	19.24	6.06	15.14	6.38	20.55	5.59	15.12	5.39	14.30	17.43	7.03	6.50	18.15	6.01	15.37	2.51	11.38		
	22.956	-6.68	21.651	-15.95	0.765	11.98	21.575	-15.59	21.057	-17.34	11.373	6.51	23.533	-3.82	21.806	-13.64	18.215	-17.61	10.72696	3
5	4.29	19.28	6.05	15.24	6.28	20.49	5.55	15.13	5.32	14.25	17.35	6.55	6.43	18.08	5.54	15.30	2.43	11.30		
	23.080	-5.91	21.851	-15.08	0.768	12.35	21.677	-15.09	21.086	-17.22	11.363	6.58	23.540	-3.77	21.811	-13.62	18.217	-17.61	10.85838	5
7	4.24	19.32	6.03	15.33	6.18	20.43	5.50	15.14	5.25	14.19	17.26	6.47	6.35	18.01	5.46	15.22	2.35	11.23		
	23.203	-5.13	22.054	-14.13	0.761	12.64	21.779	-14.58	21.115	-17.09	11.354	6.64	23.547	-3.73	21.815	-13.59	18.220	-17.60	10.98980	7
9	4.19	19.35	6.02	15.44	6.08	20.35	5.45	15.16	5.19	14.14	17.17	6.39	6.27	17.54	5.38	15.15	2.28	11.15		
	23.326	-4.35	22.260	-13.09	0.744	12.85	21.881	-14.06	21.144	-16.97	11.344	6.71	23.554	-3.68	21.820	-13.57	18.222	-17.60	11.12122	9
11	4.14	19.39	5.60	15.55	5.58	20.26	5.40	15.17	5.12	14.08	17.08	6.30	6.20	17.46	5.31	15.07	2.20	11.07		
	23.449	-3.57	22.468	-11.97	0.717	12.97	21.982	-13.54	21.173	-16.85	11.334	6.77	23.561	-3.64	21.825	-13.55	18.223	-17.60	11.25264	11
13	4.09	19.44	5.58	16.07	5.48	20.17	5.35	15.18	5.05	14.03	16.59	6.22	6.12	17.39	5.23	15.00	2.12	10.60		
	23.572	-2.78	22.678	-10.76	0.681	12.99	22.083	-13.00	21.202	-16.73	11.324	6.83	23.568	-3.59	21.829	-13.52	18.225	-17.59	11.38405	13
15	4.04	19.48	5.55	16.19	5.37	20.06	5.30	15.20	4.58	13.58	16.51	6.14	6.04	17.32	5.15	14.53	2.04	10.52		
	23.694	-1.99	22.891	-9.48	0.636	12.92	22.183	-12.45	21.230	-16.61	11.315	6.90	23.575	-3.54	21.833	-13.50	18.227	-17.59	11.51547	15
17	3.59	19.52	5.53	16.31	5.27	19.54	5.25	15.21	4.51	13.52	16.42	6.06	5.56	17.25	5.07	14.45	1.56	10.44		
	23.816	-1.20	23.107	-8.11	0.583	12.75	22.283	-11.90	21.257	-16.49	11.305	6.96	23.582	-3.50	21.838	-13.48	18.228	-17.59	11.64689	17
19	3.53	19.56	5.50	16.45	5.18	19.40	5.20	15.22	4.44	13.47	16.33	5.58	5.49	17.18	4.60	14.38	1.49	10.36		
	23.937	-0.41	23.326	-6.67	0.522	12.48	22.383	-11.34	21.285	-16.37	11.295	7.02	23.589	-3.45	21.842	-13.46	18.229	-17.58	11.77831	19
21	3.48	20.00	5.48	16.58	5.08	19.26	5.15	15.23	4.37	13.41	16.24	5.50	5.41	17.10	4.52	14.30	1.41	10.28		
	0.059	0.38	23.548	-5.15	0.456	12.11	22.482	-10.77	21.312	-16.25	11.286	7.08	23.596	-3.41	21.846	-13.44	18.230	-17.58	11.90973	21
23	3.42	20.05	5.45	17.12	4.58	19.12	5.09	15.25	4.30	13.36	16.16	5.42	5.33	17.03	4.44	14.23	1.33	10.21		
	0.180	1.17	23.774	-3.55	0.385	11.65	22.580	-10.20	21.338	-16.14	11.276	7.14	23.603	-3.36	21.850	-13.41	18.231	-17.58	12.04115	23
25	3.37	20.09	5.42	17.27	4.49	18.56	5.04	15.26	4.23	13.30	16.07	5.34	5.26	16.56	4.36	14.15	1.25	10.13		
	0.302	1.96	0.003	-1.89	0.312	11.10	22.679	-9.62	21.365	-16.02	11.267	7.20	23.610	-3.32	21.855	-13.39	18.232	-17.57	12.17257	25
27	3.31	20.14	5.38	17.42	4.41	18.40	4.59	15.27	4.16	13.24	15.58	5.26	5.18	16.49	4.29	14.08	1.17	10.05		
	0.423	2.74	0.236	-0.16	0.239	10.48	22.777	-9.03	21.391	-15.90	11.258	7.25	23.617	-3.28	21.859	-13.37	18.233	-17.57	12.30398	27
29	3.25	20.19	5.35	17.58	4.32	18.24	4.54	15.29	4.09	13.19	15.49	5.18	5.10	16.42	4.21	14.00	1.09	9.57		
	0.544	3.52	0.473	1.63	0.167	9.81	22.875	-8.44	21.416	-15.79	11.249	7.31	23.624	-3.23	21.862	-13.35	18.234	-17.57	12.43540	29
29	4.25	21.19	6.35	18.58	5.32	19.25	5.54	16.28	5.09	14.19	16.49	6.18	6.10	17.42	5.21	15.00	2.09	10.57		
	0.542	3.51	0.468	1.59	0.169	9.82	22.873	-8.45	21.416	-15.79	11.249	7.31	23.624	-3.23	21.862	-13.35	18.234	-17.57	12.43540	29
31	4.19	21.23	6.32	19.14	5.24	19.09	5.48	16.30	5.02	14.13	16.41	6.09	6.03	17.34	5.13	14.53	2.02	10.49		
	0.663	4.28	0.709	3.42	0.100	9.10	22.970	-7.86	21.441	-15.68	11.241	7.36	23.631	-3.19	21.866	-13.34	18.234	-17.56	12.56682	31

KWIECIEŃ 2009

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)											Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2454																			
91	1	Śro	923	23.53509	-3.51	0.4327	4.40	0.99936	5.4249	26.42	58.031	6.8	37	619	1249.6	1921	854	1804.0	212	553	1	
92	2	Czw	924	23.57475	-3.33	0.4706	5.03	0.99964	6.4534	25.19	58.017	7.8	48	617	1249.3	1923	1007	1904.8	307	549	2	
93	3	Pią	925	0.01440	-3.15	0.5045	5.26	0.99992	7.4604	22.20	58.079	0.8	59	615	1249.0	1924	1131	2002.6	346	545	3	
94	4	Sob	926	0.05406	-2.58	0.5424	5.49	1.00021	8.4321	18.01	58.217	1.8	70	612	1248.7	1926	1300	2056.7	412	541	4	
95	5	Nie	927	0.09371	-2.41	0.5803	6.12	1.00049	9.3721	12.45	58.435	2.8	80	610	1248.4	1928	1427	2147.4	432	537	5	
96	6	Pon	928	0.13337	-2.23	1.0142	6.35	1.00077	10.2841	6.52	58.740	3.8	88	608	1248.1	1930	1552	2235.4	447	534	6	
97	7	Wto	929	0.17302	-2.06	1.0522	6.57	1.00105	11.1813	0.44	59.136	4.8	94	605	1247.9	1932	1715	2322.0	500	530	7	
98	8	Śro	930	0.21268	-1.50	1.0902	7.20	1.00134	12.0658	-5.22	59.622	5.8	98	603	1247.6	1933	1836	*****	512	526	8	
99	9	Czw	931	0.25233	-1.33	1.1242	7.42	1.00162	12.5551	-11.07	60.185	6.8	100	601	1247.3	1935	1958	008.2	525	522	9	
100	10	Pią	932	0.29199	-1.17	1.1622	8.04	1.00191	13.4536	-16.15	60.802	0.8	99	558	1247.0	1937	2118	055.0	540	518	10	
101	11	Sob	933	0.33164	-1.01	1.2003	8.26	1.00219	14.3641	-20.33	61.436	1.8	96	556	1246.8	1939	2237	143.1	558	514	11	
102	12	Nie	934	0.37130	-0.45	1.2343	8.48	1.00248	15.2911	-23.48	62.047	2.8	92	554	1246.5	1941	2351	232.7	621	510	12	
103	13	Pon	935	0.41095	-0.30	1.2725	9.10	1.00277	16.2244	-25.52	62.587	3.8	86	551	1246.2	1942	****	323.8	652	506	13	
104	14	Wto	936	0.45061	-0.15	1.3106	9.32	1.00305	17.1638	-26.40	63.013	4.8	78	549	1246.0	1944	055	415.5	734	502	14	
105	15	Śro	937	0.49026	0.00	1.3448	9.53	1.00334	18.0959	-26.11	63.286	5.8	70	547	1245.7	1946	148	506.9	828	458	15	
106	16	Czw	938	0.52592	0.14	1.3830	10.14	1.00363	19.0159	-24.32	63.378	6.8	61	545	1245.5	1948	227	557.1	932	454	16	
107	17	Pią	939	0.56558	0.28	1.4213	10.36	1.00391	19.5211	-21.48	63.271	7.8	51	542	1245.3	1949	256	645.4	1042	450	17	
108	18	Sob	940	1.00523	0.42	1.4556	10.57	1.00420	20.4030	-18.08	62.966	0.8	42	540	1245.1	1951	318	731.5	1155	446	18	
109	19	Nie	941	1.04489	0.55	1.4940	11.17	1.00448	21.2716	-13.41	62.476	1.8	33	538	1244.8	1953	334	815.9	1310	442	19	
110	20	Pon	942	1.08454	1.07	1.5323	11.38	1.00476	22.1305	-8.36	61.832	2.8	24	536	1244.6	1955	348	859.1	1424	438	20	
111	21	Wto	943	1.12420	1.20	1.5708	11.58	1.00504	22.5846	-3.04	61.078	3.8	16	533	1244.4	1957	400	942.1	1540	435	21	
112	22	Śro	944	1.16385	1.31	2.0053	12.19	1.00531	23.4514	2.45	60.270	4.8	9	531	1244.2	1958	411	1025.8	1658	431	22	
113	23	Czw	945	1.20351	1.43	2.0438	12.39	1.00559	0.3333	8.36	59.471	5.8	4	529	1244.0	2000	423	1111.5	1819	427	23	
114	24	Pią	946	1.24316	1.53	2.0824	12.58	1.00586	1.2443	14.13	58.742	6.8	1	527	1243.9	2002	437	1200.2	1944	423	24	
115	25	Sob	947	1.28282	2.04	2.1210	13.18	1.00612	2.1937	19.13	58.140	0.3	0	525	1243.7	2004	455	1253.2	2113	419	25	
116	26	Nie	948	1.32247	2.14	2.1556	13.37	1.00639	3.1837	23.12	57.704	1.3	2	523	1243.5	2006	520	1350.7	2240	415	26	
117	27	Pon	949	1.36213	2.23	2.1944	13.57	1.00665	4.2114	25.45	57.454	2.3	7	521	1243.4	2007	556	1452.1	****	411	27	
118	28	Wto	950	1.40178	2.32	2.2331	14.15	1.00690	5.2553	26.34	57.392	3.3	14	519	1243.2	2009	647	1555.6	000	407	28	
119	29	Śro	951	1.44144	2.40	2.2720	14.34	1.00716	6.3016	25.34	57.497	4.3	23	516	1243.1	2011	757	1658.4	101	403	29	
120	30	Czw	952	1.48110	2.48	2.3108	14.53	1.00741	7.3215	22.53	57.740	5.3	34	514	1242.9	2013	919	1758.0	146	359	30	

Fazy Księżyca [Dm, h.mm]: 1kw 2, 16.34 Pełn 9, 16.56 3kw 17, 15.36 Nów 25, 5.22

MAJ 2009

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2454																					
121	1	Pią	953	1.52075	2.55	2.3457	15.11	1.00766	8.3036	18.50	58.086	6.3	45	512	1242.8	2014	1047	1853.4	216	355	1
122	2	Sob	954	1.56041	3.02	2.3847	15.29	1.00790	9.2508	13.47	58.504	0.6	56	510	1242.7	2016	1215	1944.7	237	351	2
123	3	Nie	955	2.00006	3.09	2.4237	15.46	1.00815	10.1628	8.06	58.968	1.6	67	508	1242.6	2018	1339	2032.8	254	347	3
124	4	Pon	956	2.03572	3.14	2.4628	16.04	1.00839	11.0535	2.07	59.460	2.6	77	507	1242.5	2020	1501	2118.9	307	343	4
125	5	Wto	957	2.07537	3.20	2.5019	16.21	1.00863	11.5336	-3.52	59.970	3.6	85	505	1242.4	2021	1621	2204.2	320	339	5
126	6	Śro	958	2.11503	3.24	2.5411	16.38	1.00886	12.4132	-9.35	60.493	4.6	92	503	1242.3	2023	1740	2249.8	332	336	6
127	7	Czw	959	2.15468	3.28	2.5804	16.54	1.00910	13.3015	-14.48	61.022	5.6	97	501	1242.3	2025	1900	2336.7	346	332	7
128	8	Pią	960	2.19434	3.32	3.0157	17.11	1.00934	14.2022	-19.16	61.549	6.6	99	459	1242.2	2027	2018	*****	403	328	8
129	9	Sob	961	2.23399	3.35	3.0550	17.27	1.00957	15.1208	-22.48	62.060	0.2	100	457	1242.2	2028	2134	025.2	424	324	9
130	10	Nie	962	2.27365	3.37	3.0944	17.43	1.00980	16.0519	-25.13	62.533	1.2	98	455	1242.1	2030	2242	115.6	452	320	10
131	11	Pon	963	2.31331	3.39	3.1339	17.58	1.01003	16.5915	-26.23	62.942	2.2	95	454	1242.1	2032	2339	207.1	530	316	11
132	12	Wto	964	2.35296	3.41	3.1734	18.13	1.01026	17.5258	-26.17	63.255	3.2	90	452	1242.1	2033	****	258.9	619	312	12
133	13	Śro	965	2.39262	3.41	3.2130	18.28	1.01049	18.4531	-24.57	63.443	4.2	84	450	1242.1	2035	024	349.8	720	308	13
134	14	Czw	966	2.43227	3.41	3.2527	18.43	1.01071	19.3613	-22.32	63.477	5.2	76	449	1242.1	2036	056	438.8	828	304	14
135	15	Pią	967	2.47193	3.41	3.2924	18.57	1.01093	20.2450	-19.09	63.336	6.2	68	447	1242.1	2038	120	525.5	940	300	15
136	16	Sob	968	2.51159	3.40	3.3321	19.11	1.01115	21.1134	-14.59	63.007	7.2	59	446	1242.1	2040	138	610.1	1053	256	16
137	17	Nie	969	2.55124	3.38	3.3720	19.24	1.01137	21.5657	-10.11	62.493	0.1	49	444	1242.1	2041	153	653.0	1206	252	17
138	18	Pon	970	2.59090	3.36	3.4118	19.37	1.01158	22.4149	-4.54	61.811	1.1	39	442	1242.1	2043	205	735.2	1320	248	18
139	19	Wto	971	3.03055	3.33	3.4518	19.50	1.01179	23.2705	0.42	60.995	2.1	30	441	1242.2	2044	216	817.6	1435	244	19
140	20	Śro	972	3.07021	3.30	3.4918	20.03	1.01200	0.1350	6.27	60.095	3.1	20	440	1242.2	2046	228	901.4	1553	241	20
141	21	Czw	973	3.10586	3.26	3.5318	20.15	1.01220	1.0314	12.05	59.174	4.1	12	438	1242.3	2047	241	948.0	1715	237	21
142	22	Pią	974	3.14552	3.21	3.5719	20.27	1.01239	1.5622	17.19	58.305	5.1	6	437	1242.4	2049	257	1038.6	1842	233	22
143	23	Sob	975	3.18517	3.16	4.0121	20.39	1.01258	2.5401	21.44	57.562	6.1	2	436	1242.5	2050	319	1134.3	2011	229	23
144	24	Nie	976	3.22483	3.11	4.0523	20.50	1.01277	3.5613	24.53	57.010	7.1	0	434	1242.6	2052	349	1234.9	2136	225	24
145	25	Pon	977	3.26449	3.05	4.0925	21.01	1.01295	5.0146	26.22	56.693	0.9	1	433	1242.7	2053	434	1339.4	2247	221	25
146	26	Wto	978	3.30414	2.59	4.1328	21.11	1.01312	6.0820	25.58	56.632	1.9	5	432	1242.8	2055	539	1444.8	2340	217	26
147	27	Śro	979	3.34380	2.52	4.1732	21.21	1.01329	7.1311	23.42	56.815	2.9	12	431	1242.9	2056	700	1548.0	****	213	27
148	28	Czw	980	3.38346	2.44	4.2136	21.31	1.01346	8.1423	19.53	57.208	3.9	21	430	1243.0	2057	829	1646.8	017	209	28
149	29	Pią	981	3.42311	2.36	4.2540	21.40	1.01362	9.1116	14.55	57.759	4.9	31	429	1243.1	2058	1000	1740.7	042	205	29
150	30	Sob	982	3.46277	2.28	4.2945	21.49	1.01378	10.0413	9.15	58.412	5.9	42	428	1243.3	2100	1127	1830.5	100	201	30
151	31	Nie	983	3.50242	2.19	4.3350	21.58	1.01393	10.5414	3.16	59.113	0.3	53	427	1243.4	2101	1250	1917.5	115	157	31

Fazy Księżyca [Dm, h.mm]: 1kw 1, 22.44 Pełn 9, 6.01 3kw 17, 9.26 Nów 24, 14.11 1kw 31, 5.22

MAJ 2009 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	2.31	22.59	5.38	22.18	4.01	16.30	4.24	16.47	3.10	12.40	14.30	4.05	4.03	15.41	3.13	12.55	23.55	8.47		
	2.583	15.18	3.832	22.79	0.115	2.27	0.448	1.68	21.768	-14.17	11.144	7.91	23.726	-2.58	21.911	-13.11	18.222	-17.53	14.60382	1
3	2.22	23.08	5.34	22.14	3.57	16.27	4.18	16.48	3.03	12.33	14.22	3.57	3.56	15.34	3.05	12.47	23.47	8.39		
	2.710	15.77	3.895	22.80	0.183	2.33	0.542	2.29	21.785	-14.09	11.141	7.92	23.732	-2.55	21.913	-13.10	18.220	-17.53	14.73524	3
5	2.13	23.17	5.30	22.07	3.52	16.24	4.13	16.49	2.56	12.27	14.14	3.49	3.48	15.27	2.57	12.39	23.39	8.31		
	2.839	16.35	3.933	22.66	0.256	2.44	0.636	2.91	21.801	-14.02	11.138	7.93	23.737	-2.51	21.914	-13.09	18.218	-17.53	14.86666	5
7	2.03	23.27	5.25	21.58	3.48	16.22	4.07	16.50	2.48	12.20	14.06	3.41	3.40	15.19	2.49	12.32	23.31	8.23		
	2.968	16.91	3.947	22.37	0.334	2.61	0.731	3.51	21.816	-13.95	11.136	7.94	23.742	-2.48	21.916	-13.09	18.216	-17.53	14.99807	7
9	1.52	23.39	5.20	21.46	3.44	16.20	4.02	16.51	2.41	12.14	13.58	3.33	3.32	15.12	2.41	12.24	23.23	8.15		
	3.097	17.45	3.939	21.93	0.417	2.83	0.825	4.12	21.831	-13.88	11.134	7.95	23.747	-2.45	21.917	-13.08	18.213	-17.53	15.12949	9
11	1.39	23.53	5.14	21.32	3.40	16.19	3.56	16.52	2.34	12.07	13.50	3.25	3.25	15.04	2.34	12.16	23.15	8.07		
	3.228	17.97	3.911	21.37	0.505	3.09	0.919	4.72	21.845	-13.82	11.132	7.95	23.751	-2.42	21.919	-13.07	18.211	-17.53	15.26091	11
13	1.24	0.22	5.09	21.17	3.36	16.18	3.51	16.53	2.26	12.01	13.42	3.17	3.17	14.57	2.26	12.08	23.07	7.59		
	3.358	18.47	3.865	20.70	0.596	3.39	1.013	5.32	21.858	-13.75	11.131	7.95	23.756	-2.39	21.920	-13.07	18.209	-17.53	15.39234	13
15	*****	*****	5.02	21.00	3.32	16.18	3.45	16.54	2.19	11.54	13.34	3.09	3.09	14.50	2.18	12.01	22.59	7.51		
	3.490	18.95	3.805	19.94	0.691	3.73	1.107	5.91	21.871	-13.70	11.130	7.95	23.760	-2.37	21.921	-13.06	18.206	-17.53	15.52376	15
17	*****	*****	4.56	20.43	3.28	16.18	3.40	16.55	2.11	11.47	13.26	3.01	3.01	14.42	2.10	11.53	22.51	7.43		
	3.622	19.40	3.738	19.13	0.790	4.11	1.201	6.50	21.882	-13.64	11.130	7.95	23.765	-2.34	21.922	-13.06	18.203	-17.53	15.65518	17
19	*****	*****	4.50	20.25	3.24	16.18	3.35	16.56	2.04	11.40	13.18	2.53	2.54	14.35	2.02	11.45	22.43	7.35		
	3.755	19.84	3.667	18.30	0.891	4.52	1.295	7.08	21.894	-13.59	11.130	7.94	23.769	-2.31	21.923	-13.06	18.201	-17.53	15.78660	19
21	*****	*****	4.43	20.08	3.20	16.19	3.29	16.57	1.56	11.33	13.11	2.46	2.46	14.27	1.54	11.37	22.35	7.27		
	3.888	20.25	3.599	17.49	0.996	4.96	1.389	7.66	21.904	-13.55	11.131	7.93	23.773	-2.29	21.923	-13.05	18.198	-17.53	15.91801	21
23	*****	*****	4.36	19.51	3.16	16.20	3.24	16.58	1.49	11.26	13.03	2.38	2.38	14.20	1.47	11.29	22.27	7.19		
	4.022	20.64	3.538	16.75	1.103	5.43	1.483	8.23	21.914	-13.50	11.132	7.92	23.777	-2.27	21.924	-13.05	18.195	-17.53	16.04943	23
25	*****	*****	4.30	19.36	3.12	16.21	3.18	16.59	1.41	11.19	12.55	2.30	2.30	14.12	1.39	11.21	22.19	7.11		
	4.157	21.01	3.487	16.09	1.213	5.92	1.578	8.79	21.923	-13.47	11.133	7.90	23.780	-2.24	21.924	-13.05	18.192	-17.53	16.18086	25
27	*****	*****	4.23	19.23	3.08	16.23	3.13	16.60	1.34	11.12	12.47	2.22	2.23	14.04	1.31	11.14	22.11	7.03		
	4.292	21.35	3.451	15.56	1.326	6.44	1.672	9.35	21.931	-13.43	11.135	7.88	23.784	-2.22	21.924	-13.05	18.189	-17.53	16.31228	27
29	*****	*****	4.16	19.11	3.05	16.25	3.08	17.01	1.26	11.05	12.40	2.14	2.15	13.57	1.23	11.06	22.03	6.55		
	4.428	21.67	3.431	15.16	1.440	6.97	1.767	9.90	21.938	-13.40	11.137	7.86	23.787	-2.20	21.924	-13.05	18.186	-17.53	16.44370	29
31	*****	*****	4.10	19.02	3.01	16.27	3.02	17.02	1.18	10.57	12.32	2.06	2.07	13.49	1.15	10.58	21.55	6.47		
	4.564	21.96	3.429	14.91	1.557	7.52	1.861	10.45	21.945	-13.38	11.140	7.84	23.790	-2.18	21.924	-13.05	18.182	-17.54	16.57512	31

CZERWIEC 2009

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2454																					
152	1	Pon	984	3.54208	2.10	4.3756	22.06	1.01407	11.4230	-2.43	59.818	1.3	64	426	1243.6	2102	1410	2002.9	127	153	1
153	2	Wto	985	3.58173	2.01	4.4202	22.14	1.01422	12.3009	-8.28	60.496	2.3	74	425	1243.7	2103	1529	2048.0	140	149	2
154	3	Śro	986	4.02139	1.51	4.4608	22.21	1.01436	13.1812	-13.44	61.127	3.3	82	424	1243.9	2104	1648	2133.9	153	145	3
155	4	Czw	987	4.06104	1.41	4.5015	22.28	1.01450	14.0724	-18.19	61.700	4.3	89	423	1244.1	2105	1805	2221.3	209	142	4
156	5	Pią	988	4.10070	1.31	4.5422	22.35	1.01463	14.5813	-22.02	62.210	5.3	95	423	1244.2	2106	1921	2310.5	228	138	5
157	6	Sob	989	4.14036	1.20	4.5829	22.41	1.01476	15.5036	-24.41	62.655	6.3	98	422	1244.4	2107	2032	*****	253	134	6
158	7	Nie	990	4.18001	1.09	5.0237	22.47	1.01489	16.4405	-26.09	63.028	7.3	100	421	1244.6	2108	2132	001.3	327	130	7
159	8	Pon	991	4.21567	0.57	5.0645	22.52	1.01501	17.3747	-26.22	63.322	0.7	100	421	1244.8	2109	2221	052.9	413	126	8
160	9	Wto	992	4.25532	0.46	5.1053	22.58	1.01513	18.3040	-25.21	63.524	1.7	97	420	1245.0	2110	2257	144.1	510	122	9
161	10	Śro	993	4.29498	0.34	5.1501	23.02	1.01525	19.2153	-23.11	63.617	2.7	94	420	1245.2	2111	2323	233.8	616	118	10
162	11	Czw	994	4.33464	0.22	5.1910	23.06	1.01537	20.1060	-20.03	63.583	3.7	88	420	1245.4	2112	2343	321.3	727	114	11
163	12	Pią	995	4.37429	0.10	5.2319	23.10	1.01548	20.5800	-16.05	63.403	4.7	82	419	1245.6	2112	2358	406.4	840	110	12
164	13	Sob	996	4.41395	-0.03	5.2728	23.14	1.01559	21.4319	-11.29	63.064	5.7	74	419	1245.8	2113	000	449.5	952	106	13
165	14	Nie	997	4.45360	-0.15	5.3137	23.17	1.01569	22.2738	-6.24	62.559	6.7	65	419	1246.0	2113	011	531.2	1104	102	14
166	15	Pon	998	4.49326	-0.28	5.3546	23.19	1.01579	23.1149	-0.58	61.894	7.7	55	419	1246.2	2114	023	612.6	1217	058	15
167	16	Wto	999	4.53291	-0.41	5.3956	23.22	1.01589	23.5655	4.36	61.087	0.5	45	419	1246.4	2114	034	654.6	1332	054	16
168	17	Śro	000	4.57257	-0.54	5.4405	23.23	1.01598	0.4403	10.10	60.174	1.5	35	419	1246.6	2115	046	738.6	1450	050	17
169	18	Czw	001	5.01223	-1.07	5.4815	23.25	1.01607	1.3426	15.26	59.210	2.5	25	419	1246.9	2115	100	826.0	1612	046	18
170	19	Pią	002	5.05188	-1.20	5.5224	23.26	1.01615	2.2907	20.07	58.262	3.5	16	419	1247.1	2116	118	917.9	1739	043	19
171	20	Sob	003	5.09154	-1.34	5.5634	23.26	1.01622	3.2843	23.46	57.409	4.5	8	419	1247.3	2116	144	1015.3	1906	039	20
172	21	Nie	004	5.13119	-1.47	6.0044	23.26	1.01629	4.3250	25.58	56.729	5.5	3	419	1247.5	2116	221	1117.9	2025	035	21
173	22	Pon	005	5.17085	-1.60	6.0454	23.26	1.01635	5.3944	26.21	56.289	6.5	0	419	1247.7	2116	315	1223.6	2128	031	22
174	23	Wto	006	5.21051	-2.13	6.0903	23.25	1.01641	6.4643	24.47	56.132	0.6	1	420	1248.0	2116	431	1329.5	2212	027	23
175	24	Śro	007	5.25016	-2.26	6.1313	23.24	1.01646	7.5106	21.25	56.269	1.6	4	420	1248.2	2116	600	1432.3	2243	023	24
176	25	Czw	008	5.28582	-2.39	6.1722	23.23	1.01650	8.5122	16.40	56.679	2.6	10	420	1248.4	2116	734	1530.3	2304	019	25
177	26	Pią	009	5.32547	-2.52	6.2132	23.21	1.01654	9.4719	10.60	57.310	3.6	18	421	1248.6	2116	906	1623.5	2320	015	26
178	27	Sob	010	5.36513	-3.04	6.2541	23.18	1.01657	10.3940	4.53	58.094	4.6	28	421	1248.8	2116	1033	1713.0	2334	011	27
179	28	Nie	011	5.40479	-3.17	6.2950	23.16	1.01660	11.2933	-1.17	58.958	5.6	38	422	1249.0	2116	1156	1700.0	2347	007	28
180	29	Pon	012	5.44444	-3.29	6.3358	23.13	1.01662	12.1809	-7.13	59.836	6.6	49	422	1249.2	2116	1317	1846.0	****	003	29
181	30	Wto	013	5.48410	-3.41	6.3807	23.09	1.01664	13.0634	-12.40	60.673	0.9	60	423	1249.4	2115	1437	1932.0	000	2355	30

Fazy Księżyca [Dm, h.mm]: Pełn 7, 20.12 3kw 16, 0.15 Nów 22, 21.35 1kw 29, 13.28

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Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	*****	*****	4.07	18.58	2.59	16.28	2.60	17.02	1.14	10.54	12.28	2.02	2.03	13.46	1.11	10.54	21.51	6.43		
	4.632	22.10	3.435	14.83	1.616	7.80	1.909	10.72	21.948	-13.36	11.142	7.83	23.792	-2.17	21.924	-13.05	18.181	-17.54	16.64083	1
3	*****	*****	4.01	18.51	2.55	16.31	2.55	17.03	1.07	10.46	12.21	1.55	1.55	13.38	1.03	10.46	21.43	6.35		
	4.769	22.35	3.460	14.80	1.736	8.37	2.004	11.25	21.953	-13.34	11.145	7.80	23.794	-2.16	21.924	-13.06	18.178	-17.54	16.77225	3
5	*****	*****	3.55	18.47	2.51	16.33	2.49	17.04	0.59	10.39	12.14	1.47	1.48	13.30	0.56	10.38	21.34	6.27		
	4.906	22.58	3.505	14.91	1.858	8.95	2.098	11.77	21.958	-13.33	11.149	7.77	23.797	-2.14	21.924	-13.06	18.174	-17.54	16.90367	5
7	*****	*****	3.49	18.44	2.47	16.36	2.44	17.05	0.51	10.31	12.06	1.39	1.40	13.23	0.48	10.30	21.26	6.18		
	5.044	22.78	3.567	15.15	1.982	9.54	2.193	12.29	21.962	-13.32	11.153	7.74	23.799	-2.13	21.923	-13.06	18.171	-17.54	17.03509	7
9	*****	*****	3.44	18.43	2.44	16.39	2.39	17.06	0.44	10.23	11.59	1.31	1.32	13.15	0.40	10.22	21.18	6.10		
	5.181	22.96	3.648	15.51	2.107	10.13	2.289	12.80	21.965	-13.31	11.157	7.70	23.802	-2.11	21.922	-13.07	18.167	-17.55	17.16652	9
11	*****	*****	3.39	18.44	2.40	16.43	2.34	17.06	0.36	10.16	11.51	1.23	1.24	13.07	0.32	10.14	21.10	6.02		
	5.319	23.11	3.746	15.98	2.235	10.73	2.384	13.29	21.967	-13.31	11.162	7.67	23.804	-2.10	21.921	-13.07	18.164	-17.55	17.29794	11
13	*****	*****	3.34	18.47	2.36	16.46	2.29	17.07	0.28	10.08	11.44	1.16	1.16	12.60	0.24	10.06	21.02	5.54		
	5.458	23.23	3.862	16.54	2.364	11.34	2.479	13.78	21.969	-13.31	11.168	7.63	23.806	-2.09	21.921	-13.08	18.161	-17.55	17.42936	13
15	*****	*****	3.30	18.51	2.33	16.49	2.24	17.08	0.20	10.00	11.37	1.08	1.08	12.52	0.16	9.58	20.54	5.46		
	5.596	23.32	3.994	17.17	2.495	11.94	2.575	14.26	21.969	-13.32	11.173	7.58	23.807	-2.08	21.919	-13.09	18.157	-17.56	17.56078	15
17	*****	*****	3.27	18.57	2.29	16.53	2.19	17.09	0.13	9.52	11.29	1.00	1.01	12.44	0.08	9.50	20.46	5.38		
	5.735	23.39	4.143	17.86	2.628	12.55	2.671	14.73	21.969	-13.33	11.180	7.54	23.809	-2.07	21.918	-13.09	18.153	-17.56	17.69220	17
19	*****	*****	3.24	19.04	2.26	16.57	2.14	17.09	0.05	9.44	11.22	0.52	0.53	12.36	23.56	9.42	20.38	5.30		
	5.873	23.43	4.309	18.60	2.763	13.15	2.767	15.19	21.968	-13.34	11.186	7.49	23.810	-2.06	21.917	-13.10	18.150	-17.56	17.82362	19
21	*****	*****	3.22	19.12	2.23	17.01	2.09	17.10	23.53	9.36	11.15	0.45	0.45	12.29	23.48	9.34	20.30	5.22		
	6.012	23.44	4.492	19.37	2.899	13.74	2.863	15.64	21.966	-13.36	11.193	7.44	23.811	-2.06	21.915	-13.11	18.146	-17.57	17.95504	21
23	*****	*****	3.21	19.21	2.20	17.04	2.04	17.11	23.45	9.28	11.08	0.37	0.37	12.21	23.41	9.26	20.22	5.14		
	6.151	23.42	4.692	20.14	3.037	14.33	2.959	16.08	21.963	-13.39	11.200	7.39	23.812	-2.05	21.914	-13.12	18.143	-17.57	18.08647	23
25	*****	*****	3.21	19.32	2.16	17.08	1.59	17.11	23.37	9.20	11.01	0.29	0.29	12.13	23.33	9.18	20.14	5.06		
	6.290	23.38	4.909	20.90	3.176	14.90	3.055	16.50	21.960	-13.41	11.208	7.34	23.813	-2.05	21.912	-13.13	18.139	-17.57	18.21789	25
27	*****	*****	3.21	19.43	2.14	17.13	1.54	17.12	23.29	9.11	10.54	0.22	0.22	12.05	23.25	9.10	20.06	4.57		
	6.428	23.31	5.144	21.62	3.318	15.47	3.152	16.92	21.955	-13.45	11.216	7.28	23.813	-2.05	21.910	-13.14	18.136	-17.58	18.34931	27
29	*****	*****	3.24	19.55	2.11	17.17	1.50	17.12	23.21	9.03	10.47	0.14	0.14	11.57	23.17	9.02	19.58	4.49		
	6.566	23.21	5.395	22.29	3.460	16.02	3.248	17.32	21.950	-13.48	11.224	7.23	23.814	-2.05	21.908	-13.15	18.132	-17.58	18.48073	29

LIPIEC 2009

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2455																		
182	1	Śro	014	5.52375	-3.52	6.4215	23.05	1.01665	13.5539	-17.26	61.431	1.9	70	424	1249.6	2115	1555	2019.0	015	2351	1
183	2	Czw	015	5.56341	-4.04	6.4623	23.01	1.01666	14.4601	-21.21	62.086	2.9	79	424	1249.8	2115	1711	2107.5	033	2348	2
184	3	Pią	016	6.00306	-4.15	6.5030	22.56	1.01667	15.3750	-24.13	62.628	3.9	86	425	1250.0	2114	1823	2157.6	056	2344	3
185	4	Sob	017	6.04272	-4.25	6.5438	22.51	1.01667	16.3048	-25.57	63.055	4.9	92	426	1250.2	2114	1927	2248.7	127	2340	4
186	5	Nie	018	6.08238	-4.36	6.5845	22.45	1.01666	17.2416	-26.27	63.369	5.9	97	427	1250.3	2113	2019	2339.8	209	2336	5
187	6	Pon	019	6.12203	-4.46	7.0251	22.39	1.01666	18.1714	-25.43	63.576	6.9	99	428	1250.5	2113	2058	*****	303	2332	6
188	7	Wto	020	6.16169	-4.56	7.0658	22.33	1.01664	19.0851	-23.50	63.678	0.0	100	429	1250.7	2112	2127	030.0	406	2328	7
189	8	Śro	021	6.20134	-5.05	7.1103	22.26	1.01663	19.5831	-20.54	63.677	1.0	99	430	1250.8	2111	2149	118.2	516	2324	8
190	9	Czw	022	6.24100	-5.14	7.1509	22.19	1.01661	20.4604	-17.07	63.567	2.0	96	431	1251.0	2110	2206	204.2	629	2320	9
191	10	Pią	023	6.28066	-5.22	7.1914	22.11	1.01659	21.3144	-12.39	63.341	3.0	92	432	1251.1	2110	2219	247.9	741	2316	10
192	11	Sob	024	6.32031	-5.30	7.2319	22.04	1.01657	22.1605	-7.40	62.992	4.0	86	433	1251.3	2109	2231	329.9	853	2312	11
193	12	Nie	025	6.35597	-5.38	7.2723	21.55	1.01654	22.5951	-2.21	62.513	5.0	79	434	1251.4	2108	2242	410.9	1005	2308	12
194	13	Pon	026	6.39562	-5.45	7.3126	21.47	1.01651	23.4359	3.07	61.901	6.0	70	435	1251.5	2107	2253	452.1	1118	2304	13
195	14	Wto	027	6.43528	-5.52	7.3530	21.38	1.01647	0.2929	8.36	61.165	7.0	60	437	1251.6	2106	2306	534.3	1233	2300	14
196	15	Śro	028	6.47493	-5.58	7.3932	21.28	1.01643	1.1730	13.51	60.326	0.0	50	438	1251.7	2105	2322	619.0	1351	2256	15
197	16	Czw	029	6.51459	-6.04	7.4335	21.18	1.01639	2.0906	18.37	59.419	1.0	39	439	1251.8	2104	2343	707.4	1514	2252	16
198	17	Pią	030	6.55424	-6.09	7.4737	21.08	1.01633	3.0510	22.35	58.497	2.0	29	441	1251.9	2102	****	800.5	1638	2249	17
199	18	Sob	031	6.59390	-6.14	7.5138	20.58	1.01628	4.0556	25.19	57.628	3.0	19	442	1252.0	2101	013	859.0	1800	2245	18
200	19	Nie	032	7.03356	-6.18	7.5539	20.47	1.01622	5.1033	26.28	56.887	4.0	11	443	1252.0	2100	057	1002.0	1910	2241	19
201	20	Pon	033	7.07321	-6.22	7.5939	20.36	1.01615	6.1701	25.44	56.348	5.0	4	445	1252.1	2059	201	1107.2	2003	2237	20
202	21	Wto	034	7.11287	-6.25	8.0339	20.24	1.01607	7.2241	23.08	56.073	6.0	1	446	1252.2	2057	324	1211.7	2040	2233	21
203	22	Śro	035	7.15253	-6.27	8.0738	20.12	1.01599	8.2526	18.52	56.095	0.3	0	448	1252.2	2056	457	1312.9	2106	2229	22
204	23	Czw	036	7.19218	-6.29	8.1136	20.00	1.01591	9.2418	13.25	56.416	1.3	3	449	1252.2	2054	632	1409.8	2125	2225	23
205	24	Pią	037	7.23184	-6.31	8.1534	19.48	1.01582	10.1927	7.16	57.000	2.3	8	450	1252.3	2053	805	1502.5	2140	2221	24
206	25	Sob	038	7.27149	-6.31	8.1931	19.35	1.01572	11.1143	0.53	57.788	3.3	15	452	1252.3	2052	933	1552.1	2154	2217	25
207	26	Nie	039	7.31115	-6.32	8.2328	19.22	1.01562	12.0212	-5.22	58.702	4.3	24	454	1252.3	2050	1057	1640.0	2207	2213	26
208	27	Pon	040	7.35080	-6.31	8.2724	19.08	1.01551	12.5157	-11.09	59.663	5.3	34	455	1252.3	2048	1220	1727.3	2222	2209	27
209	28	Wto	041	7.39046	-6.30	8.3120	18.54	1.01540	13.4154	-16.14	60.600	6.3	45	457	1252.2	2047	1340	1815.0	2239	2205	28
210	29	Śro	042	7.43011	-6.28	8.3515	18.40	1.01528	14.3242	-20.27	61.455	0.5	55	458	1252.2	2045	1459	1903.7	2300	2201	29
211	30	Czw	043	7.46577	-6.26	8.3909	18.26	1.01515	15.2438	-23.38	62.189	1.5	65	500	1252.2	2043	1613	1953.7	2329	2157	30
212	31	Pią	044	7.50542	-6.23	8.4303	18.11	1.01503	16.1734	-25.40	62.777	2.5	74	501	1252.1	2042	1720	2044.7	****	2153	31

Fazy Księżyca [Dm, h.mm]: Pełn 7, 11.21 3kw 15, 11.53 Nów 22, 4.35 1kw 29, 24.00

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Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	****	****	3.27	20.08	2.08	17.21	1.45	17.13	23.13	8.54	10.40	0.06	0.06	11.50	23.09	8.54	19.50	4.41		
	6.704	23.08	5.662	22.87	3.605	16.56	3.345	17.71	21.944	-13.52	11.232	7.17	23.814	-2.05	21.906	-13.16	18.129	-17.59	18.61215	1
3	****	****	3.33	20.21	2.06	17.25	1.41	17.13	23.05	8.46	10.33	23.55	23.54	11.42	23.01	8.46	19.42	4.33		
	6.842	22.93	5.944	23.35	3.751	17.08	3.441	18.10	21.937	-13.57	11.241	7.11	23.814	-2.05	21.904	-13.17	18.125	-17.59	18.74357	3
5	****	****	3.40	20.33	2.03	17.29	1.36	17.14	22.57	8.37	10.26	23.47	23.46	11.34	22.53	8.38	19.34	4.25		
	6.979	22.75	6.239	23.68	3.899	17.59	3.538	18.46	21.930	-13.62	11.251	7.04	23.813	-2.05	21.902	-13.19	18.122	-17.60	18.87499	5
7	****	****	3.49	20.45	2.01	17.34	1.32	17.14	22.49	8.29	10.19	23.39	23.38	11.26	22.45	8.30	19.26	4.17		
	7.116	22.55	6.544	23.86	4.048	18.07	3.635	18.82	21.922	-13.67	11.260	6.98	23.813	-2.06	21.899	-13.20	18.118	-17.61	19.00642	7
9	****	****	3.60	20.56	1.59	17.38	1.27	17.14	22.41	8.20	10.12	23.32	23.30	11.18	22.37	8.22	19.18	4.09		
	7.252	22.32	6.856	23.86	4.199	18.53	3.732	19.16	21.912	-13.73	11.270	6.91	23.812	-2.06	21.897	-13.21	18.115	-17.61	19.13784	9
11	****	****	4.12	21.05	1.58	17.42	1.23	17.14	22.33	8.11	10.05	23.24	23.23	11.10	22.29	8.14	19.10	4.01		
	7.388	22.06	7.170	23.67	4.351	18.97	3.829	19.50	21.903	-13.79	11.280	6.84	23.811	-2.07	21.894	-13.23	18.111	-17.62	19.26926	11
13	****	****	4.26	21.13	1.56	17.46	1.19	17.15	22.25	8.02	9.58	23.16	23.15	11.02	22.21	8.06	19.02	3.53		
	7.524	21.78	7.483	23.31	4.505	19.39	3.926	19.82	21.892	-13.85	11.291	6.77	23.810	-2.08	21.892	-13.24	18.108	-17.62	19.40068	13
15	****	****	4.40	21.19	1.55	17.50	1.14	17.15	22.17	7.53	9.51	23.09	23.07	10.54	22.13	7.58	18.54	3.45		
	7.659	21.47	7.791	22.77	4.660	19.78	4.023	20.12	21.881	-13.92	11.301	6.70	23.809	-2.09	21.889	-13.26	18.105	-17.63	19.53210	15
17	****	****	4.56	21.24	1.54	17.54	1.10	17.15	22.09	7.44	9.44	23.01	22.59	10.46	22.05	7.49	18.46	3.36		
	7.793	21.14	8.092	22.06	4.817	20.14	4.120	20.42	21.869	-13.99	11.312	6.62	23.808	-2.10	21.886	-13.27	18.101	-17.64	19.66352	17
19	****	****	5.12	21.28	1.53	17.58	1.06	17.15	22.00	7.35	9.38	22.54	22.51	10.38	21.58	7.41	18.38	3.28		
	7.927	20.78	8.383	21.22	4.975	20.47	4.217	20.70	21.857	-14.06	11.324	6.55	23.806	-2.11	21.883	-13.29	18.098	-17.64	19.79494	19
21	****	****	5.28	21.30	1.53	18.02	1.02	17.14	21.52	7.26	9.31	22.46	22.43	10.30	21.50	7.33	18.30	3.20		
	8.061	20.40	8.664	20.25	5.134	20.77	4.315	20.96	21.844	-14.13	11.335	6.47	23.804	-2.12	21.880	-13.30	18.095	-17.65	19.92636	21
23	****	****	5.43	21.30	1.53	18.06	0.58	17.14	21.44	7.17	9.24	22.38	22.35	10.22	21.42	7.25	18.22	3.12		
	8.193	20.00	8.933	19.17	5.295	21.04	4.412	21.22	21.831	-14.21	11.347	6.39	23.802	-2.14	21.877	-13.32	18.092	-17.66	20.05779	23
25	****	****	5.59	21.30	1.53	18.09	0.55	17.14	21.36	7.08	9.17	22.31	22.27	10.14	21.34	7.17	18.14	3.04		
	8.325	19.58	9.191	18.02	5.456	21.27	4.509	21.46	21.816	-14.29	11.359	6.31	23.800	-2.15	21.874	-13.34	18.089	-17.66	20.18921	25
27	****	****	6.13	21.29	1.53	18.13	0.51	17.14	21.28	6.59	9.11	22.23	22.19	10.06	21.26	7.09	18.06	2.56		
	8.457	19.13	9.437	16.79	5.619	21.48	4.606	21.69	21.802	-14.37	11.371	6.23	23.798	-2.17	21.871	-13.36	18.086	-17.67	20.32062	27
29	1.14	0.05	6.28	21.27	1.54	18.16	0.47	17.13	21.19	6.49	9.04	22.16	22.11	9.58	21.18	7.01	17.58	2.48		
	8.587	18.67	9.671	15.51	5.783	21.64	4.702	21.90	21.787	-14.46	11.384	6.15	23.795	-2.19	21.868	-13.37	18.084	-17.68	20.45204	29
31	1.36	-0.07	6.41	21.25	1.55	18.19	0.44	17.13	21.11	6.40	8.57	22.08	22.03	9.50	21.10	6.52	17.50	2.40		
	8.717	18.18	9.895	14.18	5.947	21.77	4.799	22.10	21.771	-14.54	11.396	6.07	23.793	-2.20	21.864	-13.39	18.081	-17.69	20.58346	31

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Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2455																					
213	1	Sob	045	7.54508	-6.20	8.4656	17.56	1.01490	17.1058	-26.28	63.212	3.5	82	503	1252.1	2040	1816	2135.9	007	2150	1
214	2	Nie	046	7.58474	-6.15	8.5048	17.40	1.01476	18.0403	-26.02	63.494	4.5	89	505	1252.0	2038	1859	2226.3	056	2146	2
215	3	Pon	047	8.02439	-6.11	8.5440	17.25	1.01463	18.5558	-24.25	63.636	5.5	94	506	1251.9	2036	1932	2315.2	157	2142	3
216	4	Wto	048	8.06405	-6.05	8.5831	17.09	1.01449	19.4608	-21.44	63.650	6.5	98	508	1251.8	2035	1955	*****	305	2138	4
217	5	Śro	049	8.10371	-5.59	9.0221	16.53	1.01434	20.3417	-18.09	63.552	7.5	100	510	1251.7	2033	2013	001.9	417	2134	5
218	6	Czw	050	8.14336	-5.53	9.0611	16.36	1.01420	21.2033	-13.49	63.353	0.4	100	511	1251.6	2031	2028	046.5	530	2130	6
219	7	Pią	051	8.18302	-5.45	9.1001	16.19	1.01405	22.0523	-8.56	63.062	1.4	98	513	1251.5	2029	2040	129.2	643	2126	7
220	8	Sob	052	8.22267	-5.37	9.1349	16.03	1.01390	22.4924	-3.40	62.683	2.4	95	515	1251.4	2027	2051	210.7	755	2122	8
221	9	Nie	053	8.26233	-5.29	9.1737	15.45	1.01374	23.3326	1.48	62.219	3.4	90	516	1251.2	2025	2102	251.8	908	2118	9
222	10	Pon	054	8.30198	-5.20	9.2125	15.28	1.01359	0.1822	7.16	61.669	4.4	83	518	1251.1	2023	2114	333.5	1022	2114	10
223	11	Wto	055	8.34164	-5.11	9.2512	15.10	1.01343	1.0512	12.32	61.036	5.4	74	520	1250.9	2021	2129	416.9	1138	2110	11
224	12	Śro	056	8.38129	-5.01	9.2859	14.52	1.01326	1.5455	17.23	60.329	6.4	65	521	1250.8	2019	2147	503.2	1257	2106	12
225	13	Czw	057	8.42095	-4.50	9.3245	14.34	1.01309	2.4821	21.30	59.567	7.4	54	523	1250.6	2017	2212	553.2	1419	2102	13
226	14	Pią	058	8.46060	-4.39	9.3630	14.15	1.01292	3.4556	24.34	58.782	0.6	43	525	1250.4	2015	2249	647.9	1540	2058	14
227	15	Sob	059	8.50026	-4.27	9.4015	13.57	1.01275	4.4721	26.14	58.019	1.6	32	526	1250.2	2013	2342	747.0	1653	2055	15
228	16	Nie	060	8.53591	-4.15	9.4359	13.38	1.01257	5.5118	26.13	57.338	2.6	22	528	1250.0	2011	****	849.4	1752	2051	16
229	17	Pon	061	8.57557	-4.02	9.4743	13.19	1.01239	6.5545	24.24	56.801	3.6	13	530	1249.8	2009	054	952.6	1835	2047	17
230	18	Wto	062	9.01523	-3.49	9.5127	12.59	1.01220	7.5837	20.53	56.470	4.6	6	531	1249.6	2006	221	1054.2	1905	2043	18
231	19	Śro	063	9.05488	-3.36	9.5510	12.40	1.01200	8.5837	15.58	56.392	5.6	1	533	1249.3	2004	355	1152.6	1927	2039	19
232	20	Czw	064	9.09454	-3.22	9.5852	12.20	1.01181	9.5524	10.04	56.588	6.6	0	535	1249.1	2002	529	1247.4	1944	2035	20
233	21	Pią	065	9.13419	-3.07	10.0234	12.00	1.01160	10.4927	3.41	57.050	1.0	1	537	1248.9	2000	700	1339.2	1959	2031	21
234	22	Sob	066	9.17385	-2.52	10.0616	11.40	1.01140	11.4136	-2.47	57.736	2.0	6	538	1248.6	1958	828	1428.9	2013	2027	22
235	23	Nie	067	9.21350	-2.36	10.0957	11.20	1.01118	12.3251	-8.55	58.586	3.0	12	540	1248.4	1955	954	1517.8	2027	2023	23
236	24	Pon	068	9.25316	-2.20	10.1337	10.59	1.01097	13.2403	-14.26	59.522	4.0	20	542	1248.1	1953	1117	1606.7	2044	2019	24
237	25	Wto	069	9.29281	-2.04	10.1717	10.38	1.01075	14.1552	-19.05	60.468	5.0	29	543	1247.8	1951	1239	1656.4	2104	2015	25
238	26	Śro	070	9.33247	-1.47	10.2057	10.18	1.01052	15.0835	-22.41	61.354	6.0	39	545	1247.5	1949	1357	1747.1	2130	2011	26
239	27	Czw	071	9.37212	-1.30	10.2436	9.57	1.01029	16.0207	-25.06	62.126	7.0	49	547	1247.2	1946	1509	1838.6	2205	2007	27
240	28	Pią	072	9.41178	-1.12	10.2815	9.35	1.01006	16.5600	-26.17	62.745	0.9	59	549	1247.0	1944	1609	1930.3	2251	2003	28
241	29	Sob	073	9.45144	-0.55	10.3154	9.14	1.00983	17.4931	-26.12	63.188	1.9	68	550	1246.7	1942	1658	2021.3	2348	1959	29
242	30	Nie	074	9.49109	-0.36	10.3532	8.53	1.00959	18.4153	-24.54	63.451	2.9	77	552	1246.3	1939	1733	2110.8	****	1956	30
243	31	Pon	075	9.53075	-0.18	10.3910	8.31	1.00935	19.3232	-22.31	63.540	3.9	84	554	1246.0	1937	1800	2158.3	054	1952	31

Fazy Księżyca [Dm, h.mm]: Pełn 6, 2.55 3kw 13, 20.55 Now 20, 12.02 1kw 27, 13.42

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Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST (0^h UT) Dm	
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach		
1	1.44	23.54	6.48	21.23	1.55	18.20	0.42	17.12	21.07	6.35	8.54	22.04	21.60	9.45	21.06	6.48	17.46	2.36		
	8.782	17.93	10.003	13.51	6.030	21.83	4.847	22.20	21.764	-14.59	11.403	6.02	23.791	-2.21	21.863	-13.40	18.080	-17.69	20.64917	1
3	1.57	23.42	7.01	21.20	1.57	18.23	0.38	17.11	20.59	6.26	8.48	21.57	21.52	9.37	20.58	6.40	17.38	2.28		
	8.911	17.41	10.211	12.15	6.195	21.90	4.944	22.38	21.748	-14.67	11.416	5.94	23.788	-2.23	21.859	-13.42	18.077	-17.70	20.78060	3
5	2.09	23.31	7.13	21.16	1.59	18.25	0.35	17.11	20.50	6.17	8.41	21.49	21.44	9.29	20.50	6.32	17.30	2.20		
	9.039	16.88	10.410	10.77	6.362	21.94	5.040	22.55	21.731	-14.76	11.429	5.85	23.785	-2.26	21.856	-13.44	18.075	-17.70	20.91202	5
7	2.19	23.21	7.24	21.11	2.01	18.27	0.32	17.10	20.42	6.07	8.34	21.42	21.36	9.21	20.42	6.24	17.22	2.12		
	9.167	16.32	10.600	9.39	6.528	21.94	5.136	22.70	21.715	-14.85	11.442	5.76	23.782	-2.28	21.853	-13.45	18.072	-17.71	21.04344	7
9	2.28	23.12	7.35	21.07	2.03	18.29	0.28	17.09	20.34	5.58	8.28	21.34	21.28	9.13	20.34	6.16	17.14	2.04		
	9.294	15.75	10.781	8.02	6.696	21.90	5.232	22.85	21.698	-14.94	11.456	5.67	23.779	-2.30	21.849	-13.47	18.070	-17.72	21.17485	9
11	2.36	23.03	7.44	21.02	2.06	18.31	0.25	17.07	20.25	5.49	8.21	21.27	21.20	9.05	20.26	6.07	17.06	1.56		
	9.420	15.17	10.953	6.66	6.863	21.82	5.327	22.97	21.681	-15.03	11.470	5.58	23.775	-2.32	21.846	-13.49	18.068	-17.73	21.30627	11
13	2.44	22.55	7.54	20.56	2.09	18.32	0.22	17.06	20.17	5.39	8.15	21.19	21.12	8.56	20.18	5.59	16.58	1.47		
	9.546	14.56	11.117	5.31	7.031	21.70	5.422	23.09	21.665	-15.12	11.483	5.49	23.772	-2.35	21.842	-13.51	18.066	-17.74	21.43769	13
15	2.52	22.47	8.02	20.50	2.12	18.33	0.19	17.05	20.09	5.30	8.08	21.12	21.04	8.48	20.10	5.51	16.50	1.39		
	9.671	13.94	11.272	3.99	7.199	21.54	5.517	23.19	21.648	-15.21	11.497	5.40	23.768	-2.37	21.839	-13.53	18.064	-17.75	21.56911	15
17	2.59	22.39	8.10	20.45	2.16	18.34	0.16	17.03	20.00	5.20	8.02	21.04	20.56	8.40	20.02	5.43	16.42	1.31		
	9.795	13.31	11.419	2.71	7.367	21.34	5.612	23.28	21.631	-15.29	11.512	5.31	23.764	-2.40	21.835	-13.55	18.062	-17.75	21.70053	17
19	3.06	22.31	8.17	20.38	2.20	18.34	0.13	17.02	19.52	5.11	7.55	20.57	20.48	8.32	19.54	5.35	16.34	1.23		
	9.919	12.66	11.558	1.47	7.535	21.10	5.706	23.36	21.614	-15.38	11.526	5.22	23.760	-2.43	21.832	-13.57	18.061	-17.76	21.83196	19
21	3.12	22.24	8.23	20.32	2.24	18.34	0.11	17.00	19.44	5.01	7.49	20.49	20.40	8.23	19.46	5.27	16.26	1.15		
	10.043	12.00	11.687	0.27	7.703	20.82	5.800	23.43	21.597	-15.47	11.540	5.12	23.756	-2.45	21.828	-13.58	18.059	-17.77	21.96337	21
23	3.18	22.17	8.29	20.25	2.29	18.34	0.08	16.58	19.35	4.52	7.42	20.42	20.32	8.15	19.38	5.18	16.18	1.07		
	10.166	11.33	11.806	-0.87	7.870	20.51	5.893	23.48	21.580	-15.55	11.555	5.03	23.752	-2.48	21.825	-13.60	18.058	-17.78	22.09479	23
25	3.24	22.10	8.33	20.18	2.33	18.34	0.05	16.56	19.27	4.43	7.36	20.34	20.24	8.07	19.30	5.10	16.11	0.59		
	10.288	10.64	11.916	-1.94	8.037	20.15	5.986	23.52	21.563	-15.63	11.570	4.93	23.747	-2.51	21.821	-13.62	18.056	-17.79	22.22621	25
27	3.30	22.03	8.36	20.11	2.38	18.33	0.03	16.54	19.19	4.33	7.29	20.27	20.16	7.59	19.22	5.02	16.03	0.51		
	10.410	9.94	12.013	-2.93	8.204	19.76	6.079	23.55	21.547	-15.72	11.584	4.84	23.743	-2.54	21.818	-13.64	18.055	-17.80	22.35762	27
29	3.36	21.56	8.38	20.03	2.43	18.32	23.56	16.52	19.10	4.24	7.23	20.19	20.08	7.50	19.14	4.54	15.55	0.43		
	10.532	9.23	12.098	-3.83	8.370	19.33	6.171	23.57	21.531	-15.79	11.599	4.74	23.738	-2.57	21.814	-13.66	18.054	-17.81	22.48905	29
31	3.41	21.49	8.39	19.55	2.48	18.31	23.54	16.49	19.02	4.15	7.16	20.12	20.00	7.42	19.06	4.46	15.47	0.35		
	10.653	8.52	12.168	-4.61	8.535	18.86	6.262	23.57	21.515	-15.87	11.614	4.64	23.734	-2.60	21.811	-13.68	18.053	-17.82	22.62047	31

WRZESIEŃ 2009

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 10 ^h UT)											Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2455																			
244	1	Wto	076	9.57040	0.01	10.4248	8.09	1.00911	20.2115	-19.11	63.472	4.9	90	555	1245.7	1935	1820	2243.6	205	1948	1	
245	2	Śro	077	10.01006	0.21	10.4625	7.47	1.00887	21.0806	-15.03	63.271	5.9	95	557	1245.4	1932	1835	2327.0	317	1944	2	
246	3	Czw	078	10.04571	0.40	10.5002	7.25	1.00862	21.5329	-10.17	62.964	6.9	99	559	1245.1	1930	1849	*****	430	1940	3	
247	4	Pią	079	10.08537	1.00	10.5339	7.03	1.00838	22.3801	-5.05	62.575	7.9	100	601	1244.7	1928	1900	009.2	543	1936	4	
248	5	Sob	080	10.12502	1.20	10.5715	6.41	1.00813	23.2225	0.22	62.127	0.7	99	602	1244.4	1925	1912	050.8	656	1932	5	
249	6	Nie	081	10.16468	1.41	11.0051	6.19	1.00789	0.0733	5.53	61.637	1.7	97	604	1244.1	1923	1924	132.7	810	1928	6	
250	7	Pon	082	10.20433	2.01	11.0427	5.56	1.00764	0.5417	11.15	61.116	2.7	92	606	1243.7	1921	1938	216.0	926	1924	7	
251	8	Wto	083	10.24399	2.22	11.0803	5.34	1.00739	1.4329	16.13	60.572	3.7	86	607	1243.4	1918	1955	301.6	1045	1920	8	
252	9	Śro	084	10.28364	2.43	11.1139	5.11	1.00714	2.3553	20.30	60.011	4.7	78	609	1243.0	1916	2018	350.5	1206	1916	9	
253	10	Czw	085	10.32330	3.04	11.1515	4.49	1.00688	3.3154	23.47	59.438	5.7	68	611	1242.7	1913	2050	443.2	1326	1912	10	
254	11	Pią	086	10.36295	3.25	11.1850	4.26	1.00663	4.3117	25.48	58.867	6.7	58	613	1242.3	1911	2136	539.9	1441	1908	11	
255	12	Sob	087	10.40261	3.46	11.2225	4.03	1.00637	5.3303	26.15	58.318	0.3	46	614	1242.0	1909	2239	639.7	1544	1904	12	
256	13	Nie	088	10.44227	4.07	11.2601	3.40	1.00612	6.3533	25.02	57.824	1.3	35	616	1241.6	1906	2358	740.7	1631	1900	13	
257	14	Pon	089	10.48192	4.28	11.2936	3.17	1.00586	7.3702	22.10	57.424	2.3	25	618	1241.3	1904	****	840.9	1705	1857	14	
258	15	Wto	090	10.52158	4.50	11.3311	2.54	1.00559	8.3617	17.52	57.162	3.3	15	619	1240.9	1901	126	938.8	1729	1853	15	
259	16	Śro	091	10.56123	5.11	11.3646	2.31	1.00533	9.3251	12.29	57.079	4.3	8	621	1240.6	1859	257	1033.6	1748	1849	16	
260	17	Czw	092	11.00089	5.32	11.4022	2.08	1.00506	10.2702	6.23	57.204	5.3	3	623	1240.2	1856	428	1125.8	1804	1845	17	
261	18	Pią	093	11.04054	5.54	11.4357	1.44	1.00479	11.1933	-0.01	57.547	6.3	0	625	1239.9	1854	556	1216.0	1818	1841	18	
262	19	Sob	094	11.08020	6.15	11.4732	1.21	1.00452	12.1116	-6.18	58.093	0.6	1	626	1239.5	1852	723	1305.4	1832	1837	19	
263	20	Nie	095	11.11585	6.36	11.5107	0.58	1.00424	13.0301	-12.08	58.805	1.6	4	628	1239.1	1849	848	1354.9	1848	1833	20	
264	21	Pon	096	11.15551	6.58	11.5443	0.34	1.00396	13.5529	-17.13	59.625	2.6	9	630	1238.8	1847	1012	1445.2	1907	1829	21	
265	22	Wto	097	11.19516	7.19	11.5818	0.11	1.00368	14.4857	-21.18	60.487	3.6	16	631	1238.4	1844	1134	1536.7	1931	1825	22	
266	23	Śro	098	11.23482	7.40	12.0154	-0.12	1.00339	15.4319	-24.12	61.323	4.6	24	633	1238.1	1842	1250	1629.1	2003	1821	23	
267	24	Czw	099	11.27447	8.01	12.0529	-0.36	1.00311	16.3806	-25.50	62.071	5.6	33	635	1237.7	1840	1357	1721.7	2045	1817	24	
268	25	Pią	100	11.31413	8.21	12.0905	-0.59	1.00282	17.3229	-26.09	62.680	6.6	42	637	1237.4	1837	1451	1813.8	2139	1813	25	
269	26	Sob	101	11.35378	8.42	12.1241	-1.22	1.00253	18.2540	-25.14	63.115	0.2	52	638	1237.0	1835	1532	1904.2	2242	1809	26	
270	27	Nie	102	11.39344	9.02	12.1617	-1.46	1.00224	19.1701	-23.11	63.357	1.2	61	640	1236.7	1832	1602	1952.6	2351	1805	27	
271	28	Pon	103	11.43310	9.23	12.1954	-2.09	1.00195	20.0618	-20.08	63.402	2.2	70	642	1236.4	1830	1624	2038.6	****	1802	28	
272	29	Wto	104	11.47275	9.43	12.2330	-2.32	1.00166	20.5336	-16.16	63.262	3.2	79	644	1236.0	1827	1641	2122.7	103	1758	29	
273	30	Śro	105	11.51241	10.02	12.2707	-2.56	1.00137	21.3921	-11.43	62.960	4.2	86	645	1235.7	1825	1655	2205.2	215	1754	30	

Fazy Księżyca [Dm, h.mm]: Pełn 4, 18.03 3kw 12, 4.16 Nów 18, 20.44 1kw 26, 6.50

PAŹDZIERNIK 2009

Piwnice, CA UMK			← Dane na godz. 12 czasu strefowego (= 10 lub 11 ^b UT) →									 Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2455																		
274	1	Czw	106	11.55206	10.22	12.3044	-3.19	1.00108	22.2409	-6.40	62.530	5.2	92	647	1235.4	1823	1708	2247.1	328	1750	1
275	2	Pią	107	11.59172	10.41	12.3421	-3.42	1.00079	23.0848	-1.17	62.011	6.2	96	649	1235.1	1820	1720	2329.2	441	1746	2
276	3	Sob	108	12.03137	11.00	12.3759	-4.05	1.00051	23.5407	4.15	61.443	7.2	99	651	1234.7	1818	1732	*****	555	1742	3
277	4	Nie	109	12.07103	11.19	12.4137	-4.29	1.00022	0.4059	9.42	60.862	0.2	100	652	1234.4	1816	1745	012.5	711	1738	4
278	5	Pon	110	12.11068	11.37	12.4515	-4.52	0.99993	1.3018	14.51	60.302	1.2	99	654	1234.1	1813	1802	058.0	830	1734	5
279	6	Wto	111	12.15034	11.55	12.4854	-5.15	0.99965	2.2244	19.22	59.784	2.2	95	656	1233.8	1811	1823	146.7	951	1730	6
280	7	Śro	112	12.18599	12.12	12.5233	-5.38	0.99937	3.1840	22.56	59.321	3.2	89	658	1233.5	1808	1853	239.1	1113	1726	7
281	8	Czw	113	12.22565	12.29	12.5613	-6.01	0.99908	4.1749	25.15	58.919	4.2	81	659	1233.3	1806	1935	335.3	1231	1722	8
282	9	Pią	114	12.26530	12.46	12.5953	-6.23	0.99880	5.1910	26.03	58.576	5.2	71	701	1233.0	1804	2033	434.4	1337	1718	9
283	10	Sob	115	12.30496	13.02	13.0333	-6.46	0.99852	6.2104	25.13	58.294	6.2	61	703	1232.7	1801	2146	534.8	1429	1714	10
284	11	Nie	116	12.34462	13.17	13.0714	-7.09	0.99824	7.2149	22.47	58.074	0.0	49	705	1232.5	1759	2310	634.4	1506	1710	11
285	12	Pon	117	12.38427	13.33	13.1055	-7.31	0.99797	8.2015	18.57	57.926	1.0	38	707	1232.2	1757	****	731.6	1533	1706	12
286	13	Wto	118	12.42393	13.47	13.1437	-7.54	0.99769	9.1558	14.01	57.865	2.0	27	708	1232.0	1755	038	825.8	1553	1703	13
287	14	Śro	119	12.46358	14.01	13.1820	-8.16	0.99741	10.0915	8.18	57.911	3.0	18	710	1231.7	1752	205	917.2	1609	1659	14
288	15	Czw	120	12.50324	14.15	13.2203	-8.38	0.99713	11.0053	2.11	58.082	4.0	10	712	1231.5	1750	331	1006.7	1624	1655	15
289	16	Pią	121	12.54289	14.28	13.2547	-9.00	0.99685	11.5145	-3.60	58.392	5.0	4	714	1231.3	1748	456	1055.2	1638	1651	16
290	17	Sob	122	12.58255	14.40	13.2931	-9.22	0.99657	12.4247	-9.55	58.841	6.0	1	716	1231.1	1746	621	1143.9	1653	1647	17
291	18	Nie	123	13.02220	14.52	13.3316	-9.44	0.99629	13.3442	-15.15	59.414	0.2	0	718	1230.9	1743	745	1233.5	1710	1643	18
292	19	Pon	124	13.06186	15.03	13.3701	-10.06	0.99601	14.2757	-19.43	60.083	1.2	2	719	1230.7	1741	907	1324.6	1732	1639	19
293	20	Wto	125	13.10151	15.13	13.4047	-10.27	0.99573	15.2230	-23.04	60.801	2.2	5	721	1230.5	1739	1027	1417.2	1801	1635	20
294	21	Śro	126	13.14117	15.23	13.4434	-10.49	0.99545	16.1753	-25.10	61.517	3.2	11	723	1230.4	1737	1139	1510.6	1839	1631	21
295	22	Czw	127	13.18082	15.32	13.4821	-11.10	0.99517	17.1311	-25.57	62.176	4.2	18	725	1230.2	1735	1239	1603.7	1929	1627	22
296	23	Pią	128	13.22048	15.41	13.5209	-11.31	0.99489	18.0726	-25.26	62.726	5.2	26	727	1230.1	1732	1326	1655.5	2029	1623	23
297	24	Sob	129	13.26014	15.48	13.5558	-11.52	0.99461	18.5947	-23.44	63.123	6.2	35	729	1229.9	1730	1400	1745.1	2136	1619	24
298	25	Nie	130	13.29579	15.55	13.5948	-12.13	0.99433	19.4951	-20.59	63.336	7.2	44	731	1229.8	1728	1426	1832.1	2247	1615	25
298	25	Nie	130	14.30078	15.56	13.5957	-12.14	0.99432	19.5153	-20.51	63.341	7.2	45	631	1129.8	1628	1326	1732.1	2147	1515	25
299	26	Pon	131	14.34043	16.02	14.0347	-12.34	0.99404	20.3936	-17.14	63.343	0.4	54	632	1129.7	1626	1345	1816.7	2259	1511	26
300	27	Wto	132	14.38009	16.08	14.0738	-12.54	0.99377	21.2529	-12.55	63.144	1.4	63	634	1129.6	1624	1400	1859.5	****	1507	27
301	28	Śro	133	14.41574	16.13	14.1130	-13.15	0.99350	22.1012	-8.04	62.757	2.4	72	636	1129.5	1622	1413	1941.2	010	1504	28
302	29	Czw	134	14.45540	16.17	14.1522	-13.34	0.99323	22.5433	-2.51	62.212	3.4	81	638	1129.5	1620	1426	2022.9	122	1500	29
303	30	Pią	135	14.49505	16.20	14.1915	-13.54	0.99296	23.3927	2.36	61.554	4.4	88	640	1129.4	1618	1438	2105.5	235	1456	30
304	31	Sob	136	14.53471	16.23	14.2309	-14.14	0.99269	0.2553	8.04	60.832	5.4	94	642	1129.4	1616	1451	2150.2	350	1452	31

Fazy Księżyca [Dm, h.mm]: Pełn 4, 8.10 3kw 11, 10.56 Now 18, 7.33 Now 18, 6.33 1kw 26, 1.42

PAŹDZIERNIK 2009 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		Merkury		Wenus		Mars		Jowisz		Saturn		Uran		Neptun		Pluton		ST	
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	Dm
1	4.51	20.19	5.14	17.58	4.21	17.50	23.21	15.58	16.55	1.58	5.37	18.16	17.56	5.33	17.03	2.40	13.46	22.29		
	12.512	-3.32	11.516	3.61	11.006	7.73	7.590	22.41	21.346	-16.65	11.850	3.14	23.659	-3.08	21.765	-13.91	18.058	-17.96	0.65746	1
3	4.55	20.14	5.10	17.55	4.28	17.46	23.18	15.54	16.47	1.50	5.30	18.08	17.48	5.25	16.55	2.32	13.39	22.21		
	12.633	-4.09	11.587	3.67	11.160	6.83	7.669	22.28	21.341	-16.67	11.865	3.04	23.654	-3.11	21.763	-13.92	18.060	-17.97	0.78887	3
5	4.59	20.09	5.10	17.52	4.34	17.43	23.16	15.50	16.39	1.41	5.24	18.01	17.40	5.16	16.47	2.24	13.31	22.13		
	12.754	-4.86	11.693	3.41	11.313	5.91	7.746	22.13	21.337	-16.68	11.880	2.95	23.650	-3.14	21.761	-13.93	18.062	-17.98	0.92029	5
7	5.03	20.04	5.13	17.49	4.40	17.39	23.14	15.45	16.31	1.33	5.17	17.53	17.32	5.08	16.39	2.16	13.23	22.06		
	12.876	-5.63	11.828	2.85	11.466	4.98	7.823	21.98	21.334	-16.70	11.895	2.85	23.645	-3.17	21.759	-13.94	18.063	-17.99	1.05171	7
9	5.06	19.59	5.19	17.47	4.47	17.35	23.12	15.41	16.23	1.25	5.11	17.46	17.24	4.60	16.31	2.07	13.15	21.58		
	12.998	-6.39	11.986	2.05	11.619	4.03	7.899	21.83	21.332	-16.70	11.910	2.76	23.641	-3.20	21.757	-13.95	18.065	-18.00	1.18313	9
11	5.10	19.55	5.27	17.44	4.53	17.31	23.10	15.36	16.15	1.17	5.04	17.38	17.16	4.52	16.24	1.59	13.08	21.50		
	13.121	-7.15	12.162	1.05	11.771	3.08	7.973	21.67	21.331	-16.70	11.925	2.67	23.636	-3.23	21.756	-13.96	18.068	-18.00	1.31455	11
13	5.14	19.50	5.37	17.41	4.59	17.27	23.07	15.31	16.07	1.10	4.58	17.31	17.08	4.43	16.16	1.51	13.00	21.42		
	13.244	-7.90	12.349	-0.11	11.924	2.12	8.046	21.51	21.330	-16.70	11.940	2.58	23.632	-3.25	21.754	-13.97	18.070	-18.01	1.44597	13
15	5.17	19.46	5.47	17.38	5.06	17.24	23.05	15.27	15.59	1.02	4.51	17.23	17.01	4.35	16.08	1.43	12.52	21.34		
	13.367	-8.64	12.545	-1.38	12.076	1.15	8.119	21.34	21.331	-16.70	11.954	2.49	23.628	-3.28	21.752	-13.98	18.072	-18.02	1.57739	15
17	5.21	19.41	5.59	17.35	5.12	17.20	23.03	15.22	15.51	0.54	4.45	17.16	16.53	4.27	15.60	1.35	12.45	21.27		
	13.492	-9.37	12.747	-2.73	12.228	0.18	8.190	21.18	21.332	-16.69	11.969	2.40	23.624	-3.30	21.751	-13.98	18.075	-18.03	1.70880	17
19	5.24	19.37	6.10	17.32	5.19	17.16	23.00	15.17	15.43	0.46	4.38	17.08	16.45	4.19	15.52	1.28	12.37	21.19		
	13.617	-10.10	12.952	-4.12	12.380	-0.79	8.259	21.01	21.334	-16.67	11.983	2.31	23.620	-3.33	21.750	-13.99	18.077	-18.04	1.84022	19
21	5.28	19.33	6.23	17.29	5.25	17.12	22.58	15.12	15.36	0.39	4.32	17.01	16.37	4.10	15.44	1.20	12.29	21.11		
	13.743	-10.81	13.158	-5.54	12.533	-1.77	8.328	20.84	21.338	-16.65	11.997	2.22	23.616	-3.35	21.749	-14.00	18.080	-18.05	1.97164	21
23	5.31	19.29	6.35	17.26	5.31	17.08	22.55	15.07	15.28	0.31	4.25	16.53	16.29	4.02	15.36	1.12	12.22	21.03		
	13.869	-11.52	13.366	-6.97	12.686	-2.75	8.395	20.67	21.342	-16.63	12.011	2.14	23.612	-3.38	21.748	-14.00	18.083	-18.05	2.10306	23
25	5.35	19.25	6.47	17.23	5.38	17.04	22.52	15.02	15.20	0.24	4.19	16.46	16.21	3.54	15.28	1.04	12.14	20.56		
	13.997	-12.21	13.574	-8.39	12.839	-3.72	8.461	20.49	21.346	-16.60	12.025	2.05	23.609	-3.40	21.747	-14.00	18.086	-18.06	2.23448	25
25	4.35	18.25	5.48	16.23	4.38	16.04	21.52	14.02	14.20	23.20	3.19	15.46	15.21	2.54	14.28	0.04	11.14	19.56		
	13.999	-12.23	13.578	-8.42	12.842	-3.74	8.463	20.49	21.347	-16.60	12.025	2.05	23.609	-3.40	21.747	-14.00	18.086	-18.06	2.23448	25
27	4.38	18.21	5.60	16.20	4.45	16.00	21.50	13.57	14.12	23.13	3.12	15.38	15.13	2.46	14.20	23.52	11.07	19.48		
	14.127	-12.91	13.786	-9.81	12.995	-4.71	8.527	20.32	21.352	-16.57	12.039	1.96	23.605	-3.42	21.746	-14.01	18.089	-18.07	2.36590	27
29	4.41	18.18	6.12	16.17	4.51	15.56	21.47	13.51	14.05	23.05	3.05	15.31	15.05	2.38	14.13	23.44	10.59	19.40		
	14.256	-13.57	13.994	-11.18	13.149	-5.67	8.590	20.15	21.359	-16.54	12.053	1.88	23.602	-3.44	21.746	-14.01	18.092	-18.08	2.49732	29
31	4.45	18.14	6.24	16.13	4.58	15.53	21.44	13.46	13.57	22.58	2.59	15.23	14.57	2.30	14.05	23.36	10.51	19.33		
	14.386	-14.23	14.202	-12.51	13.304	-6.63	8.652	19.98	21.366	-16.50	12.066	1.80	23.599	-3.46	21.745	-14.01	18.096	-18.08	2.62874	31

LISTOPAD 2009

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2455																					
305	1	Nie	137	14.57436	16.25	14.2704	-14.33	0.99243	1.1449	13.20	60.103	6.4	98	644	1129.3	1614	1507	2238.1	508	1448	1
306	2	Pon	138	15.01402	16.26	14.3059	-14.52	0.99218	2.0706	18.05	59.422	7.4	100	646	1129.3	1612	1527	2330.0	630	1444	2
307	3	Wto	139	15.05367	16.26	14.3456	-15.11	0.99192	3.0313	21.59	58.834	0.7	99	647	1129.3	1610	1554	*****	753	1440	3
308	4	Śro	140	15.09333	16.26	14.3853	-15.29	0.99167	4.0302	24.40	58.373	1.7	97	649	1129.3	1609	1632	026.2	915	1436	4
309	5	Czw	141	15.13299	16.24	14.4251	-15.47	0.99142	5.0526	25.50	58.056	2.7	91	651	1129.3	1607	1726	126.0	1027	1432	5
310	6	Pią	142	15.17264	16.22	14.4649	-16.05	0.99118	6.0836	25.18	57.883	3.7	84	653	1129.4	1605	1836	227.7	1125	1428	6
311	7	Sob	143	15.21230	16.19	14.5049	-16.23	0.99094	7.1029	23.06	57.841	4.7	74	655	1129.4	1603	1959	328.8	1206	1424	7
312	8	Nie	144	15.25196	16.15	14.5450	-16.41	0.99071	8.0939	19.29	57.909	5.7	64	657	1129.5	1601	2125	427.4	1236	1420	8
313	9	Pon	145	15.29161	16.10	14.5851	-16.58	0.99047	9.0536	14.45	58.067	6.7	52	659	1129.6	1600	2252	522.3	1258	1416	9
314	10	Wto	146	15.33127	16.05	15.0253	-17.15	0.99024	9.5837	9.15	58.296	0.8	41	701	1129.7	1558	****	613.9	1315	1412	10
315	11	Śro	147	15.37092	15.58	15.0656	-17.31	0.99002	10.4932	3.20	58.585	1.8	30	702	1129.8	1556	017	702.9	1330	1409	11
316	12	Czw	148	15.41058	15.51	15.1100	-17.48	0.98979	11.3922	-2.41	58.929	2.8	21	704	1129.9	1555	140	750.4	1344	1405	12
317	13	Pią	149	15.45023	15.43	15.1505	-18.04	0.98957	12.2908	-8.31	59.330	3.8	12	706	1130.0	1553	302	837.7	1358	1401	13
318	14	Sob	150	15.48589	15.34	15.1911	-18.19	0.98935	13.1944	-13.52	59.786	4.8	6	708	1130.2	1552	424	925.7	1415	1357	14
319	15	Nie	151	15.52554	15.24	15.2317	-18.35	0.98913	14.1147	-18.29	60.296	5.8	2	710	1130.4	1550	546	1015.4	1435	1353	15
320	16	Pon	152	15.56520	15.13	15.2724	-18.50	0.98892	15.0528	-22.07	60.849	6.8	0	712	1130.5	1549	706	1106.8	1500	1349	16
321	17	Wto	153	16.00485	15.01	15.3133	-19.04	0.98870	16.0029	-24.33	61.424	0.7	0	713	1130.7	1547	820	1159.7	1534	1345	17
322	18	Śro	154	16.04451	14.49	15.3542	-19.19	0.98849	16.5600	-25.42	61.993	1.7	3	715	1130.9	1546	926	1253.2	1620	1341	18
323	19	Czw	155	16.08417	14.35	15.3952	-19.33	0.98828	17.5055	-25.32	62.519	2.7	7	717	1131.2	1545	1018	1346.0	1716	1337	19
324	20	Pią	156	16.12382	14.21	15.4402	-19.46	0.98807	18.4411	-24.09	62.962	3.7	13	719	1131.4	1543	1058	1436.8	1821	1333	20
325	21	Sob	157	16.16348	14.06	15.4814	-19.60	0.98787	19.3508	-21.40	63.281	4.7	20	721	1131.6	1542	1127	1525.1	1931	1329	21
326	22	Nie	158	16.20313	13.51	15.5226	-20.13	0.98766	20.2336	-18.17	63.443	5.7	28	722	1131.9	1541	1148	1610.6	2043	1325	22
327	23	Pon	159	16.24279	13.34	15.5639	-20.25	0.98746	21.0950	-14.12	63.419	6.7	36	724	1132.2	1540	1205	1653.8	2154	1321	23
328	24	Wto	160	16.28245	13.17	16.0053	-20.37	0.98727	21.5427	-9.34	63.196	7.7	46	726	1132.5	1539	1219	1735.4	2305	1317	24
329	25	Śro	161	16.32210	12.59	16.0507	-20.49	0.98708	22.3815	-4.32	62.775	0.6	55	727	1132.8	1538	1231	1816.3	****	1313	25
330	26	Czw	162	16.36176	12.40	16.0923	-21.00	0.98689	23.2211	0.45	62.172	1.6	65	729	1133.1	1537	1243	1857.7	016	1310	26
331	27	Pią	163	16.40141	12.21	16.1339	-21.11	0.98670	0.0715	6.07	61.420	2.6	74	731	1133.4	1536	1255	1940.6	128	1306	27
332	28	Sob	164	16.44107	12.01	16.1755	-21.22	0.98652	0.5432	11.24	60.571	3.6	83	732	1133.7	1535	1310	2026.4	243	1302	28
333	29	Nie	165	16.48072	11.40	16.2213	-21.32	0.98635	1.4505	16.19	59.685	4.6	90	734	1134.1	1534	1327	2116.1	402	1258	29
334	30	Pon	166	16.52038	11.18	16.2631	-21.42	0.98618	2.3945	20.34	58.834	5.6	96	735	1134.4	1533	1351	2210.6	525	1254	30

Fazy Księżyca [Dm, h.mm]: Pełn 2, 20.14 3kw 9, 16.56 Nów 16, 20.14 1kw 24, 22.39

LISTOPAD 2009 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.46	18.12	6.31	16.12	5.01	15.51	21.42	13.43	13.53	22.55	2.55	15.20	14.53	2.25	14.01	23.32	10.48	19.29		
	14.451	-14.55	14.307	-13.16	13.381	-7.11	8.682	19.89	21.370	-16.48	12.072	1.76	23.597	-3.47	21.745	-14.01	18.098	-18.09	2.69445	1
3	4.50	18.09	6.43	16.09	5.08	15.47	21.39	13.38	13.46	22.48	2.49	15.12	14.45	2.17	13.53	23.24	10.40	19.21		
	14.582	-15.18	14.515	-14.42	13.537	-8.05	8.741	19.73	21.379	-16.43	12.086	1.68	23.594	-3.48	21.745	-14.01	18.101	-18.10	2.82587	3
5	4.53	18.06	6.55	16.06	5.14	15.43	21.36	13.32	13.38	22.41	2.42	15.05	14.37	2.09	13.45	23.16	10.32	19.13		
	14.714	-15.79	14.724	-15.63	13.693	-8.98	8.799	19.56	21.389	-16.39	12.098	1.61	23.592	-3.50	21.745	-14.01	18.105	-18.10	2.95729	5
7	4.56	18.03	7.06	16.04	5.21	15.40	21.32	13.27	13.30	22.34	2.35	14.57	14.29	2.01	13.37	23.08	10.25	19.06		
	14.847	-16.39	14.933	-16.80	13.850	-9.90	8.856	19.40	21.399	-16.33	12.111	1.53	23.589	-3.52	21.745	-14.01	18.109	-18.11	3.08871	7
9	4.59	18.00	7.18	16.02	5.28	15.36	21.29	13.21	13.23	22.27	2.29	14.50	14.21	1.53	13.29	23.01	10.17	18.58		
	14.981	-16.96	15.143	-17.90	14.009	-10.81	8.910	19.24	21.410	-16.28	12.123	1.46	23.587	-3.53	21.746	-14.01	18.112	-18.12	3.22013	9
11	5.02	17.57	7.30	15.60	5.35	15.33	21.25	13.15	13.15	22.20	2.22	14.42	14.13	1.45	13.21	22.53	10.10	18.50		
	15.116	-17.52	15.355	-18.95	14.168	-11.70	8.963	19.09	21.422	-16.22	12.135	1.39	23.585	-3.54	21.746	-14.01	18.116	-18.12	3.35155	11
13	5.06	17.55	7.41	15.58	5.41	15.30	21.21	13.09	13.08	22.13	2.15	14.35	14.05	1.37	13.14	22.45	10.02	18.43		
	15.251	-18.06	15.567	-19.93	14.328	-12.57	9.014	18.94	21.435	-16.15	12.147	1.31	23.583	-3.55	21.746	-14.01	18.120	-18.13	3.48297	13
15	5.09	17.52	7.52	15.57	5.48	15.26	21.18	13.04	13.00	22.07	2.08	14.27	13.57	1.29	13.06	22.37	9.54	18.35		
	15.388	-18.58	15.780	-20.84	14.490	-13.42	9.064	18.80	21.448	-16.09	12.159	1.25	23.581	-3.56	21.747	-14.00	18.125	-18.13	3.61439	15
17	5.12	17.50	8.03	15.56	5.55	15.23	21.13	12.58	12.53	22.00	2.01	14.20	13.49	1.21	12.58	22.29	9.47	18.27		
	15.526	-19.07	15.995	-21.69	14.652	-14.25	9.111	18.67	21.462	-16.02	12.170	1.18	23.579	-3.57	21.748	-14.00	18.129	-18.14	3.74581	17
19	5.15	17.48	8.14	15.55	6.02	15.20	21.09	12.52	12.45	21.54	1.55	14.12	13.42	1.13	12.50	22.22	9.39	18.20		
	15.664	-19.54	16.212	-22.47	14.816	-15.05	9.156	18.54	21.477	-15.94	12.181	1.12	23.578	-3.58	21.749	-13.99	18.133	-18.15	3.87723	19
21	5.17	17.46	8.24	15.55	6.08	15.18	21.05	12.46	12.38	21.47	1.48	14.05	13.34	1.05	12.42	22.14	9.32	18.12		
	15.804	-19.99	16.429	-23.17	14.981	-15.83	9.200	18.42	21.492	-15.86	12.192	1.05	23.577	-3.59	21.750	-13.99	18.138	-18.15	4.00865	21
23	5.20	17.45	8.34	15.56	6.15	15.15	20.60	12.39	12.31	21.41	1.41	13.57	13.26	0.57	12.34	22.06	9.24	18.04		
	15.944	-20.42	16.648	-23.80	15.148	-16.59	9.241	18.31	21.508	-15.78	12.203	0.99	23.576	-3.59	21.752	-13.98	18.142	-18.16	4.14008	23
25	5.23	17.43	8.44	15.57	6.22	15.13	20.55	12.33	12.23	21.34	1.34	13.49	13.18	0.49	12.27	21.58	9.17	17.57		
	16.085	-20.82	16.868	-24.34	15.315	-17.31	9.280	18.21	21.525	-15.70	12.213	0.94	23.575	-3.60	21.753	-13.97	18.147	-18.16	4.27149	25
27	5.25	17.42	8.53	15.58	6.28	15.11	20.50	12.27	12.16	21.28	1.27	13.42	13.10	0.41	12.19	21.51	9.09	17.49		
	16.227	-21.19	17.089	-24.80	15.484	-18.00	9.317	18.12	21.543	-15.61	12.223	0.88	23.574	-3.60	21.755	-13.96	18.151	-18.17	4.40291	27
29	5.28	17.41	9.01	16.01	6.35	15.09	20.45	12.21	12.09	21.22	1.20	13.34	13.02	0.33	12.11	21.43	9.01	17.42		
	16.370	-21.54	17.311	-25.18	15.655	-18.66	9.351	18.04	21.561	-15.52	12.232	0.83	23.574	-3.60	21.756	-13.95	18.156	-18.17	4.53433	29

GRUDZIEŃ 2009

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°/′	j astr	h.mmss	°/′	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2455																		
335	1	Wto	167	16.56003	10.56	16.3049	-21.51	0.98602	3.3848	23.46	58.087	6.6	99	737	1134.8	1533	1424	2309.8	648	1250	1
336	2	Śro	168	16.59569	10.33	16.3509	-22.00	0.98586	4.4135	25.32	57.506	0.1	100	738	1135.2	1532	1512	*****	807	1246	2
337	3	Czw	169	17.03535	10.10	16.3929	-22.09	0.98571	5.4624	25.34	57.134	1.1	98	740	1135.6	1531	1618	012.6	913	1242	3
338	4	Pią	170	17.07500	9.46	16.4349	-22.17	0.98556	6.5050	23.50	56.990	2.1	94	741	1136.0	1531	1739	116.2	1002	1238	4
339	5	Sob	171	17.11466	9.21	16.4810	-22.25	0.98542	7.5247	20.29	57.067	3.1	87	742	1136.4	1530	1908	218.0	1037	1234	5
340	6	Nie	172	17.15431	8.56	16.5232	-22.32	0.98529	8.5109	15.52	57.335	4.1	78	744	1136.8	1530	2038	316.1	1102	1230	6
341	7	Pon	173	17.19397	8.31	16.5654	-22.39	0.98516	9.4556	10.24	57.750	5.1	67	745	1137.2	1529	2205	410.1	1121	1226	7
342	8	Wto	174	17.23363	8.05	17.0117	-22.45	0.98503	10.3751	4.29	58.265	6.1	56	746	1137.7	1529	2329	500.6	1137	1222	8
343	9	Śro	175	17.27328	7.38	17.0540	-22.51	0.98491	11.2758	-1.32	58.834	0.4	45	747	1138.1	1529	****	548.7	1151	1218	9
344	10	Czw	176	17.31294	7.11	17.1004	-22.57	0.98480	12.1722	-7.22	59.424	1.4	34	748	1138.6	1528	051	635.7	1205	1214	10
345	11	Pią	177	17.35259	6.43	17.1428	-23.02	0.98468	13.0705	-12.46	60.010	2.4	24	750	1139.0	1528	212	722.8	1221	1211	11
346	12	Sob	178	17.39225	6.15	17.1852	-23.06	0.98458	13.5756	-17.29	60.578	3.4	16	751	1139.5	1528	332	811.1	1239	1207	12
347	13	Nie	179	17.43190	5.47	17.2317	-23.10	0.98447	14.5019	-21.17	61.123	4.4	9	752	1140.0	1528	451	900.9	1302	1203	13
348	14	Pon	180	17.47156	5.18	17.2742	-23.14	0.98437	15.4414	-24.00	61.641	5.4	4	753	1140.4	1528	607	952.6	1333	1159	14
349	15	Wto	181	17.51122	4.50	17.3208	-23.17	0.98428	16.3906	-25.30	62.128	6.4	1	753	1140.9	1528	715	1045.3	1413	1155	15
350	16	Śro	182	17.55087	4.20	17.3634	-23.20	0.98419	17.3357	-25.41	62.575	7.4	0	754	1141.4	1528	812	1138.0	1506	1151	16
351	17	Czw	183	17.59053	3.51	17.4059	-23.22	0.98410	18.2741	-24.38	62.970	1.0	1	755	1141.9	1529	856	1229.6	1608	1147	17
352	18	Pią	184	18.03018	3.21	17.4526	-23.24	0.98401	19.1924	-22.27	63.291	2.0	4	756	1142.4	1529	928	1319.0	1717	1143	18
353	19	Sob	185	18.06584	2.52	17.4952	-23.25	0.98393	20.0840	-19.18	63.514	3.0	8	756	1142.9	1529	952	1405.6	1828	1139	19
354	20	Nie	186	18.10550	2.22	17.5418	-23.26	0.98385	20.5533	-15.24	63.611	4.0	14	757	1143.4	1530	1010	1449.6	1940	1135	20
355	21	Pon	187	18.14515	1.52	17.5845	-23.26	0.98378	21.4026	-10.55	63.556	5.0	21	758	1143.9	1530	1025	1531.5	2050	1131	21
356	22	Wto	188	18.18481	1.22	18.0311	-23.26	0.98371	22.2402	-6.02	63.329	6.0	29	758	1144.4	1531	1038	1612.1	2200	1127	22
357	23	Śro	189	18.22446	0.52	18.0737	-23.26	0.98364	23.0712	-0.53	62.918	7.0	38	759	1144.9	1531	1049	1652.5	2311	1123	23
358	24	Czw	190	18.26412	0.23	18.1204	-23.25	0.98358	23.5054	4.22	62.324	8.0	47	759	1145.4	1532	1101	1733.7	****	1119	24
359	25	Pią	191	18.30377	-0.07	18.1630	-23.23	0.98352	0.3611	9.34	61.564	0.7	57	759	1145.9	1533	1114	1816.8	023	1116	25
360	26	Sob	192	18.34343	-0.37	18.2056	-23.21	0.98347	1.2409	14.31	60.672	1.7	67	759	1146.4	1533	1129	1903.2	138	1112	26
361	27	Nie	193	18.38309	-1.06	18.2522	-23.19	0.98343	2.1550	18.58	59.703	2.7	77	800	1146.9	1534	1149	1954.0	256	1108	27
362	28	Pon	194	18.42274	-1.36	18.2948	-23.16	0.98339	3.1158	22.35	58.723	3.7	85	800	1147.3	1535	1217	2049.9	418	1104	28
363	29	Wto	195	18.46240	-2.05	18.3414	-23.12	0.98336	4.1238	24.58	57.814	4.7	92	800	1147.8	1536	1256	2150.7	539	1100	29
364	30	Śro	196	18.50205	-2.34	18.3839	-23.08	0.98333	5.1651	25.47	57.056	5.7	97	800	1148.3	1537	1353	2254.6	652	1056	30
365	31	Czw	197	18.54171	-3.02	18.4305	-23.04	0.98331	6.2231	24.48	56.522	6.7	100	800	1148.8	1538	1508	2358.9	750	1052	31

Fazy Księżyca [Dm, h.mm]: Pełn 2, 8.30 3kw 9, 1.13 Now 16, 13.02 1kw 24, 18.36 Pełn 31, 20.13

GRUDZIEŃ 2009 (c.d.)

Świty, zmierny astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0 ^h UT)	
1	5.30	17.40	9.09	16.04	6.42	15.07	20.39	12.14	12.01	21.16	1.13	13.27	12.54	0.25	12.03	21.35	8.54	17.34		
	16.514	-21.86	17.532	-25.46	15.826	-19.29	9.383	17.97	21.580	-15.42	12.242	0.77	23.574	-3.60	21.758	-13.94	18.161	-18.18	4.66575	1
3	5.33	17.39	9.16	16.07	6.48	15.05	20.34	12.08	11.54	21.10	1.06	13.19	12.46	0.18	11.55	21.28	8.46	17.26		
	16.658	-22.15	17.752	-25.65	15.999	-19.88	9.413	17.91	21.599	-15.33	12.250	0.73	23.574	-3.60	21.760	-13.93	18.165	-18.18	4.79718	3
5	5.35	17.38	9.22	16.12	6.54	15.04	20.28	12.01	11.47	21.04	0.59	13.11	12.38	0.10	11.48	21.20	8.39	17.19		
	16.803	-22.41	17.971	-25.75	16.174	-20.43	9.439	17.87	21.619	-15.22	12.259	0.68	23.574	-3.59	21.762	-13.92	18.170	-18.18	4.92860	5
7	5.37	17.38	9.27	16.17	7.01	15.03	20.21	11.55	11.39	20.58	0.52	13.04	12.31	0.02	11.40	21.12	8.31	17.11		
	16.948	-22.65	18.187	-25.76	16.349	-20.95	9.463	17.84	21.639	-15.12	12.267	0.64	23.574	-3.59	21.765	-13.91	18.175	-18.19	5.06002	7
9	5.39	17.38	9.31	16.22	7.07	15.03	20.15	11.48	11.32	20.52	0.44	12.56	12.23	23.50	11.32	21.05	8.24	17.04		
	17.094	-22.85	18.399	-25.66	16.526	-21.42	9.485	17.82	21.660	-15.01	12.275	0.59	23.575	-3.58	21.767	-13.90	18.180	-18.19	5.19144	9
11	5.41	17.38	9.34	16.29	7.12	15.02	20.08	11.41	11.25	20.46	0.37	12.49	12.15	23.42	11.24	20.57	8.16	16.56		
	17.241	-23.03	18.605	-25.47	16.704	-21.85	9.503	17.82	21.682	-14.90	12.283	0.55	23.576	-3.58	21.770	-13.89	18.185	-18.19	5.32286	11
13	5.43	17.38	9.36	16.35	7.18	15.02	20.01	11.34	11.18	20.40	0.30	12.41	12.07	23.35	11.16	20.49	8.09	16.48		
	17.388	-23.17	18.803	-25.19	16.883	-22.24	9.518	17.83	21.704	-14.79	12.290	0.52	23.577	-3.57	21.772	-13.87	18.190	-18.20	5.45428	13
15	5.44	17.38	9.36	16.41	7.24	15.03	19.54	11.27	11.10	20.34	0.23	12.33	11.59	23.27	11.09	20.42	8.01	16.41		
	17.536	-23.28	18.988	-24.82	17.063	-22.59	9.530	17.86	21.726	-14.67	12.296	0.48	23.578	-3.56	21.775	-13.86	18.195	-18.20	5.58570	15
17	5.46	17.39	9.35	16.47	7.29	15.04	19.46	11.20	11.03	20.28	0.15	12.26	11.51	23.19	11.01	20.34	7.54	16.33		
	17.683	-23.37	19.158	-24.36	17.243	-22.89	9.539	17.91	21.749	-14.55	12.303	0.45	23.580	-3.55	21.778	-13.84	18.200	-18.20	5.71713	17
19	5.47	17.40	9.32	16.52	7.34	15.05	19.38	11.13	10.56	20.22	0.08	12.18	11.44	23.12	10.53	20.27	7.46	16.26		
	17.831	-23.42	19.308	-23.84	17.425	-23.14	9.545	17.97	21.773	-14.43	12.309	0.43	23.582	-3.53	21.781	-13.83	18.205	-18.20	5.84855	19
21	5.48	17.41	9.27	16.56	7.38	15.06	19.30	11.06	10.49	20.17	23.57	12.10	11.36	23.04	10.45	20.19	7.38	16.18		
	17.979	-23.44	19.430	-23.27	17.607	-23.35	9.547	18.05	21.796	-14.31	12.314	0.40	23.583	-3.52	21.784	-13.81	18.210	-18.21	5.97997	21
23	5.49	17.42	9.20	16.58	7.42	15.08	19.21	10.59	10.42	20.11	23.49	12.03	11.28	22.56	10.37	20.11	7.31	16.10		
	18.127	-23.43	19.519	-22.67	17.790	-23.51	9.545	18.15	21.821	-14.18	12.319	0.38	23.586	-3.51	21.788	-13.79	18.215	-18.21	6.11139	23
25	5.50	17.43	9.10	16.57	7.46	15.10	19.12	10.51	10.35	20.06	23.42	11.55	11.20	22.49	10.30	20.04	7.23	16.03		
	18.275	-23.38	19.565	-22.07	17.973	-23.62	9.540	18.26	21.845	-14.05	12.324	0.36	23.588	-3.49	21.791	-13.78	18.220	-18.21	6.24281	25
27	5.50	17.44	8.58	16.53	7.50	15.13	19.03	10.44	10.27	19.60	23.34	11.47	11.12	22.41	10.22	19.56	7.16	15.55		
	18.423	-23.31	19.563	-21.50	18.156	-23.68	9.532	18.39	21.870	-13.92	12.328	0.34	23.590	-3.47	21.795	-13.76	18.225	-18.21	6.37423	27
29	5.51	17.46	8.43	16.45	7.53	15.16	18.54	10.36	10.20	19.54	23.27	11.40	11.04	22.33	10.14	19.49	7.08	15.48		
	18.571	-23.21	19.505	-21.00	18.339	-23.70	9.520	18.54	21.896	-13.78	12.332	0.32	23.593	-3.45	21.798	-13.74	18.231	-18.21	6.50565	29
31	5.51	17.48	8.26	16.34	7.56	15.19	18.44	10.28	10.13	19.49	23.19	11.32	10.57	22.26	10.06	19.41	7.01	15.40		
	18.718	-23.07	19.393	-20.57	18.523	-23.66	9.504	18.70	21.922	-13.64	12.335	0.31	23.596	-3.43	21.802	-13.72	18.236	-18.21	6.63708	31

Święta państwowe i kościelne w Polsce oraz inne ważniejsze dni w roku 2009

Nowy Rok	Czw	1 styczeń	Zesłania Ducha Świętego	Nie	31 maj
Najświętszej Maryi Panny Rodzicielki	Czw	1 styczeń	Dzień Dziecka	Pon	1 czerwiec
Objawienia Pańskiego (Trzech Króli)	Wto	6 styczeń	Trójcy Najświętszej	Nie	7 czerwiec
Juliański Nowy Rok	Śro	14 styczeń	Dzień Dziękczynienia	Nie	7 czerwiec
Dzień Babci	Śro	21 styczeń	Boże Ciało	Czw	11 czerwiec
Dzień Dziadka	Czw	22 styczeń	Najświętszego Serca Pana Jezusa	Pią	19 czerwiec
Ofiarowania Pańskiego	Pon	2 luty	Dzień Ojca	Wto	23 czerwiec
Matki Boskiej Gromnicznej	Pon	2 luty	Noc Świętojańska	Wto	23 czerwiec
Walentynki	Sob	14 luty	Św. Piotra i Pawła	Pon	29 czerwiec
Tłusty czwartek	Czw	19 luty	Wniebowzięcia N.M.P.	Sob	15 sierpień
Święto UMK	Czw	19 luty	Święto Wojska Polskiego	Sob	15 sierpień
Środa Popielcowa	Śro	25 luty	Dzień Solidarności i Wolności	Pon	31 sierpień
Dzień Kobiet	Nie	8 marzec	Dzień Programisty	Nie	13 wrzesień
Narodowy Dzień Życia	Wto	24 marzec	Dożynki – Święto Plonów	Śro	23 wrzesień
Niedziela Palmowa	Nie	5 kwiecień	Dzień Papieski	Nie	11 październik
Niedziela Wielkanocna	Nie	12 kwiecień	Dzień Edukacji Narodowej	Śro	14 październik
Niedziela Miłosierdzia Bożego	Nie	19 kwiecień	Dzień Papieża Jana Pawła II	Pią	16 październik
Święto Pracy	Pią	1 maj	Wszystkich Świętych	Nie	1 listopad
Dzień Flagi Rzeczypospolitej Polskiej	Sob	2 maj	Zaduszki	Pon	2 listopad
Najświętsza Maryja Królowa Polski	Nie	3 maj	Święto Niepodległości	Śro	11 listopad
Święto Konstytucji 3 Maja	Nie	3 maj	Pierwsza niedziela Adwentu	Nie	29 listopad
Dzień Polskiej Niezapominajki	Pią	15 maj	Niepokalane Poczęcie N.M.P.	Wto	8 grudzień
Wniebowstąpienia Pańskiego	Czw	21 maj	Boże Narodzenie	Pią	25 grudzień
Dzień Matki	Wto	26 maj	Sylwester	Czw	31 grudzień

Kalendarz astronomiczny 2010

PIWNICE, CA UMK

Współrzędne geograficzne: 18.5641°E 53.0955°N, Nr strefy czasowej (> 0 , gdy na wschód) = 1 (CSE)

Kalendarz jest gregoriańskim i jest oparty na efemerydach Układu Słonecznego obliczanych z dokładnością 1' (Słońce 2", Księżyc 10", Pluton 15'). Czas gwiazdowy ma dokładność około 0.1 s. Wschody i zachody obliczono z uwzględnieniem horyzontalnej refrakcji astronomicznej (34'), rozciągłości Słońca lub Księżyca i paralaksy horyzontalnej Księżyca. Dla dat odległych o więcej niż ok. 300 lat od roku 1950 dokładności położenia planet są gorsze niż 1'!
(Kalendarz ten opracowano [KMB] w Katedrze Radioastronomii CA UMK, Toruń—Piwnice. Oblicz. dnia 7.10.2010 r.)

Data Wielkanocy: **2010 KWIECIEŃ 4**

Dla całego roku przyjęto: TDT – UT = 66 s

Pory roku [miesiąc dzień, godz. mm] (czas zimowy): Wiosna **III 20, 18.32**, Lato **VI 21, 12.29**, Jesień **IX 23, 4.09**, Zima **XII 22, 0.38**

Dane w czasie letnim odróżniono kolorem brązowym; czas ten obowiązuje **od 28 marca do 31 października 2010 r.**

Oznaczenia:

Dr — dzień 2010 roku (1 stycznia Dr = 1)

Dm — dzień miesiąca

Dt — dzień tygodnia

JD — data juliańska modulo 1000 o 12^h UT

(po nagłówku: Entier(JD/1000) dla Dm = 1)

ST — prawdziwy czas gwiazdowy

$\Delta\alpha$ — różnica czasu (czas słoneczny prawdziwy minus średni)

α — rektascensja (Słońca lub Księżyca)

δ — deklinacja (Słońca lub Księżyca)

R — odległość (Słońca lub Księżyca)

j astr — jednostka astronomiczna

ρ_{\oplus} — promień Ziemi

Faza \leftarrow dni po kwadrze i % oświetlonej części tarczy Księżyca

Wsch — wschód (Słońca, Księżyca lub planety)

Gór — górowanie czyli tranzyt (Gal. = centrum Galaktyki)

Zach — zachód (Słońca, Księżyca lub planety)

STYCZEŃ 2010

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°/′	j astr	h.mmss	°/′	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2455																		
1	1	Pią	198	18.58137	-3.31	18.4729	-22.59	0.98330	7.2711	22.01	56.259	0.7	99	800	1149.3	1539	1637	*****	833	1048	1
2	2	Sob	199	19.02102	-3.59	18.5154	-22.54	0.98329	8.2857	17.43	56.288	1.7	96	800	1149.7	1540	1810	100.8	903	1044	2
3	3	Nie	200	19.06068	-4.26	18.5618	-22.48	0.98329	9.2703	12.18	56.591	2.7	90	759	1150.2	1541	1942	158.8	925	1040	3
4	4	Pon	201	19.10033	-4.54	19.0042	-22.42	0.98329	10.2147	6.16	57.124	3.7	81	759	1150.6	1542	2111	252.8	943	1036	4
5	5	Wto	202	19.13599	-5.21	19.0506	-22.36	0.98331	11.1359	0.02	57.823	4.7	72	759	1151.1	1544	2236	343.6	958	1032	5
6	6	Śro	203	19.17565	-5.47	19.0929	-22.29	0.98332	12.0446	-6.01	58.617	5.7	61	758	1151.5	1545	****	432.4	1012	1028	6
7	7	Czw	204	19.21530	-6.13	19.1351	-22.21	0.98335	12.5510	-11.38	59.442	0.0	50	758	1152.0	1546	000	520.4	1028	1024	7
8	8	Pią	205	19.25496	-6.39	19.1813	-22.13	0.98338	13.4604	-16.33	60.244	1.0	39	757	1152.4	1548	121	608.8	1045	1021	8
9	9	Sob	206	19.29461	-7.04	19.2235	-22.05	0.98341	14.3804	-20.34	60.988	2.0	29	757	1152.8	1549	241	658.2	1107	1017	9
10	10	Nie	207	19.33427	-7.28	19.2656	-21.56	0.98345	15.3118	-23.32	61.649	3.0	20	756	1153.2	1551	357	749.0	1134	1013	10
11	11	Pon	208	19.37392	-7.52	19.3117	-21.47	0.98349	16.2528	-25.17	62.219	4.0	13	755	1153.6	1552	507	840.9	1211	1009	11
12	12	Wto	209	19.41358	-8.16	19.3536	-21.37	0.98353	17.1951	-25.47	62.695	5.0	7	755	1154.0	1554	607	933.2	1259	1005	12
13	13	Śro	210	19.45324	-8.38	19.3956	-21.27	0.98359	18.1329	-25.03	63.081	6.0	3	754	1154.4	1555	655	1024.8	1358	1001	13
14	14	Czw	211	19.49289	-9.01	19.4415	-21.17	0.98364	19.0529	-23.09	63.378	7.0	1	753	1154.8	1557	730	1114.6	1505	957	14
15	15	Pią	212	19.53255	-9.22	19.4833	-21.06	0.98370	19.5518	-20.15	63.587	0.2	0	752	1155.1	1559	757	1202.0	1616	953	15
16	16	Sob	213	19.57220	-9.43	19.5250	-20.55	0.98376	20.4249	-16.32	63.702	1.2	1	751	1155.5	1600	817	1246.9	1727	949	16
17	17	Nie	214	20.01186	-10.03	19.5707	-20.43	0.98382	21.2814	-12.11	63.714	2.2	4	750	1155.8	1602	833	1329.5	1838	945	17
18	18	Pon	215	20.05152	-10.23	20.0123	-20.31	0.98389	22.1208	-7.23	63.609	3.2	9	749	1156.1	1604	846	1410.5	1948	941	18
19	19	Wto	216	20.09117	-10.41	20.0538	-20.18	0.98396	22.5512	-2.19	63.370	4.2	15	748	1156.4	1605	858	1450.7	2058	937	19
20	20	Śro	217	20.13083	-10.59	20.0953	-20.05	0.98404	23.3817	2.53	62.984	5.2	22	747	1156.7	1607	909	1531.0	2208	933	20
21	21	Czw	218	20.17048	-11.16	20.1406	-19.52	0.98412	0.2220	8.02	62.443	6.2	30	746	1157.0	1609	921	1612.5	2321	929	21
22	22	Pią	219	20.21014	-11.33	20.1819	-19.39	0.98421	1.0819	12.58	61.751	7.2	40	744	1157.3	1611	935	1656.3	****	925	22
23	23	Sob	220	20.24579	-11.48	20.2232	-19.25	0.98430	1.5714	17.29	60.922	0.0	50	743	1157.6	1612	952	1743.6	036	922	23
24	24	Nie	221	20.28545	-12.03	20.2643	-19.10	0.98439	2.4957	21.19	59.990	1.0	60	742	1157.8	1614	1015	1835.2	154	918	24
25	25	Pon	222	20.32510	-12.17	20.3053	-18.56	0.98449	3.4657	24.09	59.006	2.0	71	740	1158.0	1616	1047	1931.7	313	914	25
26	26	Wto	223	20.36476	-12.31	20.3503	-18.41	0.98460	4.4759	25.38	58.038	3.0	80	739	1158.3	1618	1133	2032.3	428	910	26
27	27	Śro	224	20.40442	-12.43	20.3912	-18.25	0.98471	5.5149	25.29	57.168	4.0	89	738	1158.5	1620	1237	2135.4	533	906	27
28	28	Czw	225	20.44407	-12.55	20.4320	-18.10	0.98482	6.5626	23.34	56.479	5.0	95	736	1158.7	1622	1358	2238.4	623	902	28
29	29	Pią	226	20.48373	-13.05	20.4728	-17.54	0.98495	7.5946	19.56	56.043	6.0	99	735	1158.8	1624	1530	2339.1	659	858	29
30	30	Sob	227	20.52338	-13.15	20.5134	-17.37	0.98508	9.0026	14.56	55.910	0.2	100	733	1159.0	1626	1705	*****	726	854	30
31	31	Nie	228	20.56304	-13.24	20.5540	-17.21	0.98521	9.5803	8.60	56.093	1.2	98	731	1159.2	1628	1838	036.5	746	850	31

Fazy Księżyca [Dm, h.mm]: Pełn 0, 20.13 3kw 7, 11.40 Now 15, 8.11 1kw 23, 11.53 Pełn 30, 7.18

STYCZEŃ 2010 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST Zach (0^h UT) Dm	
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach		
1	5.51	17.48	8.16	16.27	7.57	15.21	18.39	10.24	10.10	19.46	23.15	11.28	10.53	22.22	10.03	19.38	6.57	15.36		
	18.792	-22.99	19.319	-20.39	18.614	-23.62	9.494	18.79	21.935	-13.57	12.337	0.31	23.598	-3.42	21.804	-13.71	18.238	-18.21	6.70279	1
3	5.51	17.50	7.56	16.10	7.59	15.25	18.28	10.17	10.02	19.41	23.08	11.20	10.45	22.14	9.55	19.30	6.49	15.29		
	18.938	-22.81	19.144	-20.12	18.797	-23.51	9.473	18.98	21.961	-13.43	12.339	0.30	23.601	-3.40	21.808	-13.69	18.243	-18.22	6.83421	3
5	5.51	17.52	7.35	15.52	8.01	15.29	18.17	10.09	9.55	19.35	22.60	11.12	10.37	22.07	9.47	19.22	6.42	15.21		
	19.085	-22.60	18.951	-19.93	18.980	-23.36	9.448	19.18	21.988	-13.29	12.342	0.30	23.604	-3.38	21.812	-13.67	18.248	-18.22	6.96563	5
7	5.51	17.55	7.16	15.34	8.03	15.34	18.06	10.00	9.48	19.30	22.52	11.05	10.29	21.59	9.39	19.15	6.34	15.14		
	19.231	-22.35	18.765	-19.85	19.162	-23.15	9.419	19.39	22.014	-13.14	12.344	0.30	23.608	-3.35	21.816	-13.65	18.253	-18.22	7.09705	7
9	5.50	17.57	6.58	15.16	8.04	15.39	17.55	9.52	9.41	19.24	22.44	10.57	10.22	21.52	9.32	19.08	6.27	15.06		
	19.376	-22.08	18.607	-19.86	19.343	-22.90	9.387	19.62	22.042	-13.00	12.345	0.30	23.612	-3.33	21.820	-13.63	18.258	-18.22	7.22847	9
11	5.49	17.59	6.44	15.01	8.05	15.44	17.43	9.44	9.34	19.19	22.36	10.49	10.14	21.44	9.24	19.00	6.19	14.59		
	19.521	-21.78	18.490	-19.95	19.524	-22.60	9.351	19.85	22.069	-12.85	12.346	0.30	23.616	-3.30	21.824	-13.61	18.263	-18.22	7.35989	11
13	5.48	18.02	6.33	14.47	8.05	15.49	17.31	9.35	9.27	19.14	22.29	10.41	10.06	21.37	9.16	18.53	6.12	14.51		
	19.666	-21.45	18.420	-20.12	19.703	-22.25	9.312	20.10	22.097	-12.69	12.346	0.31	23.620	-3.27	21.828	-13.58	18.268	-18.22	7.49131	13
15	5.47	18.05	6.25	14.37	8.05	15.55	17.19	9.27	9.20	19.09	22.21	10.34	9.58	21.29	9.08	18.45	6.04	14.43		
	19.809	-21.10	18.394	-20.35	19.882	-21.86	9.269	20.35	22.125	-12.54	12.347	0.32	23.624	-3.24	21.833	-13.56	18.273	-18.21	7.62274	15
17	5.46	18.07	6.20	14.28	8.05	16.01	17.07	9.18	9.13	19.03	22.13	10.26	9.51	21.22	9.01	18.38	5.56	14.36		
	19.952	-20.71	18.410	-20.61	20.060	-21.42	9.224	20.61	22.153	-12.38	12.346	0.33	23.628	-3.21	21.837	-13.54	18.278	-18.21	7.75416	17
19	5.44	18.10	6.17	14.21	8.04	16.07	16.54	9.09	9.06	18.58	22.05	10.18	9.43	21.15	8.53	18.30	5.49	14.28		
	20.094	-20.31	18.460	-20.89	20.236	-20.95	9.177	20.87	22.182	-12.23	12.345	0.35	23.633	-3.18	21.842	-13.51	18.282	-18.21	7.88558	19
21	5.43	18.13	6.16	14.16	8.03	16.13	16.42	9.00	8.59	18.53	21.57	10.10	9.35	21.07	8.45	18.23	5.41	14.21		
	20.235	-19.87	18.540	-21.16	20.412	-20.43	9.127	21.12	22.210	-12.07	12.344	0.36	23.638	-3.15	21.846	-13.49	18.287	-18.21	8.01699	21
23	5.41	18.16	6.16	14.13	8.02	16.19	16.29	8.51	8.52	18.48	21.49	10.02	9.27	20.60	8.37	18.15	5.34	14.13		
	20.375	-19.41	18.645	-21.41	20.586	-19.87	9.075	21.38	22.239	-11.90	12.342	0.39	23.643	-3.12	21.851	-13.47	18.292	-18.21	8.14841	23
25	5.39	18.19	6.18	14.11	8.00	16.26	16.16	8.42	8.45	18.42	21.41	9.54	9.20	20.52	8.30	18.08	5.26	14.06		
	20.515	-18.93	18.770	-21.63	20.758	-19.27	9.022	21.63	22.268	-11.74	12.340	0.41	23.648	-3.08	21.855	-13.44	18.296	-18.21	8.27983	25
27	5.37	18.22	6.19	14.10	7.58	16.33	16.03	8.33	8.37	18.37	21.32	9.46	9.12	20.45	8.22	18.00	5.18	13.58		
	20.653	-18.42	18.911	-21.80	20.930	-18.63	8.968	21.88	22.297	-11.58	12.338	0.44	23.653	-3.05	21.860	-13.42	18.300	-18.21	8.41126	27
29	5.34	18.25	6.21	14.11	7.56	16.39	15.50	8.23	8.30	18.32	21.24	9.39	9.04	20.38	8.14	17.53	5.11	13.50		
	20.791	-17.89	19.065	-21.91	21.100	-17.96	8.913	22.11	22.327	-11.41	12.335	0.47	23.658	-3.01	21.865	-13.39	18.305	-18.21	8.54268	29
31	5.32	18.28	6.24	14.12	7.54	16.46	15.37	8.14	8.23	18.27	21.16	9.31	8.56	20.30	8.07	17.45	5.03	13.43		
	20.928	-17.34	19.230	-21.95	21.268	-17.26	8.858	22.34	22.356	-11.24	12.331	0.50	23.664	-2.98	21.870	-13.37	18.309	-18.20	8.67410	31

LUTY 2010

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2455																			
32	1	Pon	229	21.00269	-13.33	20.5945	-17.04	0.98535	10.5302	2.36	56.569	2.2	93	730	1159.3	1629	2008	130.6	803	846	1	
33	2	Wto	230	21.04235	-13.40	21.0349	-16.46	0.98550	11.4614	-3.48	57.283	3.2	85	728	1159.4	1631	2136	222.3	818	842	2	
34	3	Śro	231	21.08200	-13.47	21.0752	-16.29	0.98565	12.3836	-9.49	58.159	4.2	76	726	1159.5	1633	2301	312.6	834	838	3	
35	4	Czw	232	21.12166	-13.53	21.1154	-16.11	0.98581	13.3100	-15.08	59.115	5.2	66	725	1159.6	1635	****	402.7	851	834	4	
36	5	Pią	233	21.16131	-13.58	21.1556	-15.53	0.98597	14.2401	-19.32	60.074	6.2	56	723	1159.7	1637	025	453.2	911	830	5	
37	6	Sob	234	21.20097	-14.02	21.1957	-15.35	0.98614	15.1752	-22.50	60.975	0.5	45	721	1159.8	1639	144	544.7	937	826	6	
38	7	Nie	235	21.24063	-14.06	21.2357	-15.16	0.98631	16.1220	-24.55	61.773	1.5	35	719	1159.8	1641	258	636.9	1011	823	7	
39	8	Pon	236	21.28028	-14.08	21.2756	-14.57	0.98648	17.0650	-25.44	62.440	2.5	26	717	1159.9	1643	402	729.4	1056	819	8	
40	9	Wto	237	21.31594	-14.10	21.3155	-14.38	0.98666	18.0034	-25.18	62.964	3.5	18	716	1159.9	1645	453	821.2	1151	815	9	
41	10	Śro	238	21.35559	-14.12	21.3553	-14.18	0.98684	18.5246	-23.42	63.346	4.5	11	714	1159.9	1647	532	911.3	1255	811	10	
42	11	Czw	239	21.39525	-14.12	21.3950	-13.59	0.98702	19.4255	-21.04	63.593	5.5	6	712	1159.9	1649	601	959.3	1405	807	11	
43	12	Pią	240	21.43491	-14.12	21.4346	-13.39	0.98721	20.3052	-17.33	63.718	6.5	2	710	1159.9	1651	623	1044.9	1516	803	12	
44	13	Sob	241	21.47456	-14.11	21.4742	-13.19	0.98740	21.1647	-13.22	63.732	7.5	0	708	1159.9	1653	640	1128.2	1627	759	13	
45	14	Nie	242	21.51422	-14.09	21.5136	-12.58	0.98759	22.0108	-8.41	63.644	0.3	0	706	1159.9	1655	654	1209.8	1738	755	14	
46	15	Pon	243	21.55387	-14.07	21.5530	-12.38	0.98779	22.4432	-3.39	63.459	1.3	2	704	1159.9	1657	707	1250.3	1848	751	15	
47	16	Wto	244	21.59353	-14.03	21.5924	-12.17	0.98798	23.2744	1.31	63.177	2.3	5	702	1159.8	1659	718	1330.7	1958	747	16	
48	17	Śro	245	22.03318	-13.59	22.0316	-11.56	0.98818	0.1131	6.41	62.793	3.3	10	700	1159.7	1701	730	1411.7	2109	743	17	
49	18	Czw	246	22.07284	-13.55	22.0708	-11.35	0.98838	0.5646	11.40	62.303	4.3	16	658	1159.7	1703	744	1454.5	2223	739	18	
50	19	Pią	247	22.11249	-13.49	22.1059	-11.14	0.98859	1.4419	16.15	61.703	5.3	25	655	1159.6	1705	759	1539.9	2339	735	19	
51	20	Sob	248	22.15215	-13.43	22.1450	-10.52	0.98879	2.3458	20.12	60.998	6.3	34	653	1159.5	1706	820	1628.8	****	731	20	
52	21	Nie	249	22.19180	-13.36	22.1840	-10.31	0.98901	3.2911	23.16	60.203	7.3	44	651	1159.4	1708	847	1721.7	055	728	21	
53	22	Pon	250	22.23146	-13.29	22.2229	-10.09	0.98922	4.2660	25.10	59.347	0.4	55	649	1159.2	1710	925	1818.5	210	724	22	
54	23	Wto	251	22.27111	-13.21	22.2617	-9.47	0.98944	5.2742	25.37	58.474	1.4	65	647	1159.1	1712	1019	1918.2	317	720	23	
55	24	Śro	252	22.31077	-13.12	22.3005	-9.25	0.98966	6.2954	24.28	57.644	2.4	76	645	1159.0	1714	1130	2019.1	412	716	24	
56	25	Czw	253	22.35043	-13.03	22.3353	-9.02	0.98988	7.3158	21.39	56.930	3.4	85	642	1158.8	1716	1254	2119.2	454	712	25	
57	26	Pią	254	22.39008	-12.53	22.3739	-8.40	0.99011	8.3231	17.22	56.405	4.4	93	640	1158.6	1718	1425	2217.2	524	708	26	
58	27	Sob	255	22.42574	-12.43	22.4125	-8.18	0.99034	9.3053	11.55	56.132	5.4	98	638	1158.5	1720	1558	2312.7	547	704	27	
59	28	Nie	256	22.46539	-12.32	22.4511	-7.55	0.99058	10.2709	5.42	56.150	6.4	100	636	1158.3	1722	1731	*****	606	700	28	

Fazy Księżyca [Dm, h.mm]: 3kw 6, 0.48 Now 14, 3.51 1kw 22, 1.42 Pełn 28, 17.38

LUTY 2010 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST (0 ^h UT)	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach		
1	5.30	18.30	6.25	14.14	7.53	16.49	15.31	8.09	8.20	18.24	21.12	9.27	8.53	20.27	8.03	17.42	4.59	13.39		
	20.996	-17.06	19.317	-21.95	21.352	-16.89	8.831	22.45	22.371	-11.16	12.329	0.51	23.667	-2.96	21.872	-13.36	18.311	-18.20	8.73981	1
3	5.28	18.33	6.27	14.17	7.50	16.56	15.18	7.59	8.13	18.19	21.03	9.19	8.45	20.19	7.55	17.34	4.52	13.31		
	21.131	-16.48	19.495	-21.89	21.518	-16.14	8.776	22.65	22.400	-10.99	12.325	0.55	23.672	-2.92	21.877	-13.33	18.315	-18.20	8.87123	3
5	5.25	18.37	6.30	14.21	7.48	17.03	15.06	7.50	8.06	18.14	20.55	9.11	8.37	20.12	7.47	17.27	4.44	13.24		
	21.266	-15.88	19.681	-21.75	21.683	-15.35	8.722	22.84	22.430	-10.82	12.321	0.59	23.678	-2.88	21.882	-13.31	18.319	-18.20	9.00264	5
7	5.22	18.40	6.32	14.26	7.45	17.10	14.53	7.40	7.59	18.09	20.47	9.03	8.29	20.05	7.40	17.20	4.36	13.16		
	21.399	-15.26	19.872	-21.53	21.847	-14.54	8.670	23.02	22.460	-10.65	12.316	0.63	23.684	-2.84	21.887	-13.28	18.323	-18.20	9.13406	7
9	5.18	18.43	6.33	14.32	7.41	17.16	14.41	7.30	7.52	18.04	20.38	8.55	8.22	19.57	7.32	17.12	4.29	13.09		
	21.532	-14.63	20.068	-21.24	22.009	-13.71	8.619	23.18	22.490	-10.47	12.311	0.67	23.690	-2.80	21.892	-13.26	18.327	-18.19	9.26549	9
11	5.15	18.47	6.35	14.39	7.38	17.23	14.29	7.21	7.45	17.59	20.30	8.47	8.14	19.50	7.24	17.05	4.21	13.01		
	21.664	-13.98	20.269	-20.86	22.171	-12.84	8.570	23.32	22.520	-10.30	12.305	0.71	23.696	-2.76	21.896	-13.23	18.331	-18.19	9.39691	11
13	5.12	18.50	6.36	14.47	7.35	17.30	14.18	7.11	7.38	17.54	20.21	8.39	8.06	19.43	7.16	16.57	4.13	12.53		
	21.795	-13.31	20.472	-20.39	22.331	-11.96	8.523	23.45	22.550	-10.12	12.299	0.76	23.702	-2.72	21.901	-13.21	18.335	-18.19	9.52833	13
15	5.08	18.54	6.37	14.55	7.31	17.37	14.06	7.01	7.30	17.49	20.13	8.31	7.59	19.36	7.09	16.50	4.06	12.46		
	21.925	-12.63	20.679	-19.84	22.489	-11.05	8.480	23.55	22.580	-9.94	12.293	0.81	23.709	-2.68	21.906	-13.18	18.338	-18.19	9.65975	15
17	5.04	18.57	6.37	15.04	7.28	17.44	13.55	6.52	7.23	17.44	20.04	8.23	7.51	19.28	7.01	16.42	3.58	12.38		
	22.055	-11.94	20.887	-19.20	22.647	-10.13	8.439	23.64	22.611	-9.77	12.286	0.86	23.715	-2.64	21.911	-13.15	18.342	-18.18	9.79116	17
19	5.00	19.01	6.37	15.13	7.24	17.51	13.45	6.42	7.16	17.39	19.56	8.15	7.43	19.21	6.53	16.35	3.50	12.30		
	22.183	-11.23	21.099	-18.48	22.804	-9.18	8.401	23.72	22.641	-9.59	12.280	0.91	23.721	-2.60	21.916	-13.13	18.345	-18.18	9.92258	19
21	4.56	19.05	6.37	15.23	7.20	17.57	13.34	6.33	7.09	17.33	19.47	8.07	7.35	19.14	6.45	16.28	3.43	12.23		
	22.311	-10.51	21.311	-17.67	22.959	-8.22	8.367	23.77	22.671	-9.41	12.272	0.97	23.728	-2.55	21.921	-13.10	18.348	-18.18	10.05400	21
23	4.52	19.08	6.36	15.34	7.16	18.04	13.24	6.23	7.02	17.28	19.39	7.59	7.28	19.07	6.38	16.20	3.35	12.15		
	22.438	-9.78	21.526	-16.77	23.114	-7.25	8.336	23.81	22.701	-9.23	12.265	1.02	23.735	-2.51	21.926	-13.08	18.351	-18.18	10.18542	23
25	4.48	19.12	6.35	15.45	7.12	18.11	13.14	6.14	6.55	17.23	19.30	7.51	7.20	18.59	6.30	16.13	3.27	12.07		
	22.565	-9.04	21.743	-15.78	23.268	-6.26	8.309	23.83	22.732	-9.05	12.257	1.08	23.741	-2.47	21.931	-13.05	18.354	-18.17	10.31684	25
27	4.43	19.16	6.34	15.57	7.08	18.17	13.05	6.05	6.48	17.18	19.21	7.43	7.12	18.52	6.22	16.05	3.20	11.60		
	22.690	-8.29	21.961	-14.71	23.421	-5.26	8.286	23.84	22.762	-8.87	12.249	1.14	23.748	-2.42	21.935	-13.03	18.357	-18.17	10.44826	27

MARZEC 2010

Piwnice, CA UMK				← Dane na godz. 12 czasu strefowego (= 11 lub 10 ^h UT) →										Czas strefowy [hhmm.]								
..... Dzień				ST	Δα	α _☉	δ _☉	R _☉	α _☿	δ _☿	R _☿	Faza ☿	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ _☉	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2455																			
60	1	Pon	257	22.50505	-12.20	22.4856	-7.32	0.99082	11.2151	-0.47	56.466	0.8	99	633	1158.1	1724	1901	006.0	622	656	1	
61	2	Wto	258	22.54470	-12.08	22.5241	-7.09	0.99107	12.1549	-7.08	57.052	1.8	95	631	1157.9	1726	2030	058.1	638	652	2	
62	3	Śro	259	22.58436	-11.56	22.5625	-6.46	0.99132	13.0949	-12.56	57.852	2.8	89	629	1157.7	1727	2157	149.9	655	648	3	
63	4	Czw	260	23.02401	-11.43	23.0008	-6.23	0.99157	14.0423	-17.52	58.788	3.8	81	627	1157.5	1729	2322	242.1	715	644	4	
64	5	Pią	261	23.06367	-11.30	23.0351	-6.00	0.99183	14.5943	-21.41	59.778	4.8	72	624	1157.2	1731	****	335.1	739	640	5	
65	6	Sob	262	23.10332	-11.16	23.0734	-5.37	0.99209	15.5533	-24.14	60.745	5.8	62	622	1157.0	1733	041	428.8	811	636	6	
66	7	Nie	263	23.14298	-11.02	23.1117	-5.14	0.99235	16.5116	-25.27	61.624	6.8	52	620	1156.8	1735	150	522.6	852	632	7	
67	8	Pon	264	23.18263	-10.47	23.1459	-4.50	0.99261	17.4602	-25.22	62.369	0.8	42	617	1156.5	1737	247	615.6	945	629	8	
68	9	Wto	265	23.22229	-10.32	23.1840	-4.27	0.99288	18.3903	-24.04	62.950	1.8	33	615	1156.3	1739	331	706.9	1047	625	9	
69	10	Śro	266	23.26195	-10.17	23.2222	-4.03	0.99315	19.2952	-21.42	63.356	2.8	24	613	1156.0	1740	404	755.8	1155	621	10	
70	11	Czw	267	23.30160	-10.02	23.2603	-3.40	0.99342	20.1821	-18.27	63.586	3.8	17	610	1155.8	1742	428	842.1	1305	617	11	
71	12	Pią	268	23.34126	-9.46	23.2943	-3.16	0.99369	21.0443	-14.27	63.656	4.8	10	608	1155.5	1744	447	926.1	1416	613	12	
72	13	Sob	269	23.38091	-9.30	23.3324	-2.52	0.99396	21.4927	-9.55	63.583	5.8	5	606	1155.2	1746	502	1008.2	1526	609	13	
73	14	Nie	270	23.42057	-9.13	23.3704	-2.29	0.99423	22.3312	-4.60	63.391	6.8	2	603	1155.0	1748	515	1049.2	1637	605	14	
74	15	Pon	271	23.46022	-8.57	23.4044	-2.05	0.99451	23.1639	0.09	63.102	7.8	0	601	1154.7	1750	527	1129.7	1747	601	15	
75	16	Wto	272	23.49588	-8.40	23.4424	-1.41	0.99478	0.0037	5.20	62.735	0.6	0	558	1154.4	1751	540	1211.0	1859	557	16	
76	17	Śro	273	23.53553	-8.23	23.4803	-1.18	0.99505	0.4553	10.23	62.304	1.6	2	556	1154.1	1753	553	1253.6	2012	553	17	
77	18	Czw	274	23.57519	-8.05	23.5142	-0.54	0.99532	1.3313	15.05	61.817	2.6	6	554	1153.8	1755	608	1338.5	2127	549	18	
78	19	Pią	275	0.01484	-7.48	23.5521	-0.30	0.99560	2.2317	19.11	61.280	3.6	12	551	1153.5	1757	627	1426.4	2243	545	19	
79	20	Sob	276	0.05450	-7.30	23.5900	-0.06	0.99587	3.1630	22.27	60.695	4.6	20	549	1153.2	1759	652	1517.8	2358	541	20	
80	21	Nie	277	0.09415	-7.12	0.0239	0.17	0.99615	4.1251	24.36	60.069	5.6	29	546	1153.0	1801	726	1612.7	0**	537	21	
81	22	Pon	278	0.13381	-6.55	0.0618	0.41	0.99642	5.1141	25.25	59.412	6.6	39	544	1152.7	1802	814	1710.2	107	533	22	
82	23	Wto	279	0.17346	-6.37	0.0956	1.05	0.99670	6.1153	24.44	58.747	7.6	50	542	1152.4	1804	917	1808.8	205	530	23	
83	24	Śro	280	0.21312	-6.18	0.1335	1.28	0.99697	7.1202	22.31	58.105	1.0	61	539	1152.1	1806	1033	1907.1	250	526	24	
84	25	Czw	281	0.25278	-6.00	0.1713	1.52	0.99725	8.1100	18.52	57.532	2.0	72	537	1151.8	1808	1158	2003.7	323	522	25	
85	26	Pią	282	0.29243	-5.42	0.2052	2.15	0.99753	9.0811	14.01	57.081	3.0	82	534	1151.4	1810	1327	2058.3	348	518	26	
86	27	Sob	283	0.33209	-5.24	0.2430	2.39	0.99781	10.0337	8.17	56.803	4.0	90	532	1151.1	1811	1457	2151.1	408	514	27	
87	28	Nie	284	0.37174	-5.06	0.2808	3.02	0.99809	10.5749	2.03	56.745	5.0	96	530	1150.8	1813	1626	2242.8	425	510	28	
87	28	Nie	284	23.37076	-5.06	0.2759	3.01	0.99808	10.5534	2.19	56.742	6.0	96	630	1250.9	1913	1726	2342.8	525	610	28	
88	29	Pon	285	23.41041	-4.48	0.3138	3.25	0.99837	11.4918	-4.02	56.917	7.0	99	627	1250.6	1915	1855	*****	541	606	29	
89	30	Wto	286	23.45006	-4.30	0.3516	3.48	0.99865	12.4319	-10.06	57.335	0.3	100	625	1250.2	1917	2023	034.4	558	602	30	
90	31	Śro	287	23.48572	-4.12	0.3854	4.11	0.99894	13.3815	-15.29	57.968	1.3	98	622	1249.9	1919	2151	126.8	617	558	31	

Fazy Księżyca [Dm, h.mm]: Pełn 0, 17.38 3kw 7, 16.42 Nów 15, 22.01 1kw 23, 12.00 Pełn 30, 4.25

MARZEC 2010 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.39	19.19	6.32	16.09	7.04	18.24	12.56	5.56	6.41	17.13	19.13	7.35	7.05	18.45	6.15	15.58	3.12	11.52		
	22.816	-7.54	22.180	-13.54	23.574	-4.26	8.266	23.84	22.792	-8.69	12.241	1.20	23.755	-2.38	21.940	-13.00	18.360	-18.17	10.57968	1
3	4.34	19.23	6.30	16.22	6.60	18.31	12.47	5.47	6.34	17.08	19.04	7.27	6.57	18.38	6.07	15.50	3.04	11.44		
	22.940	-6.77	22.402	-12.29	23.726	-3.24	8.250	23.82	22.822	-8.51	12.232	1.26	23.762	-2.33	21.945	-12.98	18.362	-18.16	10.71109	3
5	4.30	19.27	6.28	16.35	6.55	18.37	12.39	5.38	6.27	17.03	18.55	7.19	6.49	18.31	5.59	15.43	2.56	11.37		
	23.064	-6.00	22.625	-10.96	23.878	-2.22	8.238	23.78	22.852	-8.33	12.223	1.32	23.769	-2.29	21.950	-12.95	18.365	-18.16	10.84251	5
7	4.25	19.31	6.26	16.48	6.51	18.44	12.31	5.29	6.20	16.58	18.47	7.11	6.42	18.23	5.51	15.36	2.49	11.29		
	23.188	-5.23	22.850	-9.53	0.029	-1.19	8.229	23.74	22.882	-8.14	12.215	1.38	23.775	-2.24	21.954	-12.93	18.367	-18.16	10.97393	7
9	4.20	19.35	6.23	17.02	6.47	18.51	12.23	5.21	6.13	16.53	18.38	7.03	6.34	18.16	5.44	15.28	2.41	11.21		
	23.311	-4.45	23.077	-8.03	0.180	-0.17	8.224	23.68	22.913	-7.96	12.206	1.44	23.782	-2.20	21.959	-12.91	18.369	-18.15	11.10535	9
11	4.15	19.39	6.20	17.17	6.43	18.57	12.16	5.12	6.06	16.48	18.29	6.55	6.26	18.09	5.36	15.21	2.33	11.13		
	23.434	-3.66	23.306	-6.44	0.331	0.86	8.222	23.61	22.943	-7.78	12.196	1.51	23.789	-2.15	21.964	-12.88	18.371	-18.15	11.23677	11
13	4.10	19.43	6.17	17.32	6.38	19.04	12.09	5.04	5.59	16.43	18.20	6.47	6.19	18.02	5.28	15.13	2.25	11.06		
	23.557	-2.87	23.537	-4.78	0.482	1.89	8.224	23.54	22.972	-7.60	12.187	1.57	23.796	-2.11	21.968	-12.86	18.373	-18.15	11.36819	13
15	4.05	19.47	6.14	17.47	6.34	19.11	12.02	4.56	5.52	16.38	18.12	6.39	6.11	17.54	5.21	15.06	2.18	10.58		
	23.679	-2.09	23.770	-3.05	0.633	2.92	8.229	23.45	23.002	-7.42	12.178	1.64	23.803	-2.06	21.973	-12.83	18.375	-18.14	11.49961	15
17	3.59	19.51	6.11	18.03	6.30	19.17	11.55	4.47	5.45	16.33	18.03	6.30	6.03	17.47	5.13	14.58	2.10	10.50		
	23.801	-1.29	0.006	-1.26	0.784	3.94	8.238	23.35	23.032	-7.24	12.168	1.70	23.810	-2.01	21.977	-12.81	18.376	-18.14	11.63102	17
19	3.54	19.56	6.07	18.19	6.25	19.24	11.49	4.39	5.38	16.28	17.54	6.22	5.55	17.40	5.05	14.51	2.02	10.43		
	23.923	-0.50	0.242	0.59	0.935	4.96	8.250	23.24	23.062	-7.06	12.159	1.76	23.817	-1.97	21.981	-12.79	18.378	-18.14	11.76244	19
21	3.49	19.60	6.04	18.35	6.21	19.31	11.43	4.32	5.30	16.22	17.45	6.14	5.48	17.33	4.57	14.43	1.54	10.35		
	0.044	0.29	0.480	2.46	1.087	5.97	8.264	23.12	23.091	-6.87	12.149	1.83	23.824	-1.92	21.986	-12.77	18.379	-18.14	11.89386	21
23	3.43	20.04	5.60	18.52	6.17	19.37	11.37	4.24	5.23	16.17	17.36	6.06	5.40	17.26	4.50	14.36	1.46	10.27		
	0.166	1.08	0.716	4.35	1.239	6.97	8.282	23.00	23.120	-6.69	12.139	1.89	23.831	-1.88	21.990	-12.74	18.380	-18.13	12.02528	23
25	3.37	20.09	5.56	19.08	6.13	19.44	11.32	4.16	5.16	16.12	17.28	5.58	5.32	17.18	4.42	14.28	1.39	10.19		
	0.287	1.86	0.950	6.23	1.391	7.96	8.302	22.86	23.150	-6.51	12.130	1.96	23.838	-1.83	21.994	-12.72	18.381	-18.13	12.15670	25
27	3.32	20.13	5.52	19.24	6.08	19.51	11.26	4.08	5.09	16.07	17.19	5.50	5.25	17.11	4.34	14.21	1.31	10.11		
	0.408	2.65	1.180	8.07	1.544	8.94	8.326	22.72	23.179	-6.34	12.120	2.02	23.845	-1.79	21.998	-12.70	18.382	-18.13	12.28812	27
29	4.26	21.18	6.47	20.39	7.04	20.57	12.21	5.01	6.02	17.02	18.10	6.42	6.17	18.04	5.26	15.13	2.23	11.04		
	0.527	3.41	1.398	9.79	1.695	9.88	8.351	22.57	23.207	-6.16	12.111	2.08	23.852	-1.74	22.002	-12.68	18.383	-18.12	12.41953	29
31	4.20	21.23	6.42	20.53	7.00	21.04	12.16	4.54	5.55	16.57	18.01	6.34	6.09	17.57	5.19	15.06	2.15	10.56		
	0.648	4.19	1.609	11.45	1.849	10.83	8.379	22.41	23.236	-5.98	12.102	2.14	23.859	-1.70	22.006	-12.66	18.383	-18.12	12.55095	31

KWIECIEŃ 2010

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2455																			
91	1	Czw	288	23.52538	-3.54	0.4233	4.35	0.99923	14.3421	-19.54	58.765	2.3	93	620	1249.6	1920	2314	220.4	639	554	1	
92	2	Pią	289	23.56503	-3.36	0.4612	4.58	0.99952	15.3125	-23.04	59.657	3.3	86	618	1249.4	1922	****	315.2	709	550	2	
93	3	Sob	290	24.00468	-3.19	0.4951	5.21	0.99981	16.2843	-24.52	60.572	4.3	78	615	1249.1	1924	031	410.6	747	546	3	
94	4	Nie	291	0.04434	-3.01	0.5330	5.44	1.00010	17.2514	-25.17	61.439	5.3	69	613	1248.8	1926	135	505.6	836	542	4	
95	5	Pon	292	0.08400	-2.44	0.5709	6.06	1.00040	18.1959	-24.25	62.197	6.3	60	611	1248.5	1928	225	558.8	936	538	5	
96	6	Wto	293	0.12365	-2.26	1.0048	6.29	1.00069	19.1217	-22.23	62.802	0.0	50	608	1248.2	1929	303	649.5	1042	535	6	
97	7	Pią	294	0.16331	-2.10	1.0428	6.52	1.00098	20.0155	-19.25	63.225	1.0	40	606	1247.9	1931	330	737.3	1152	531	7	
98	8	Czw	295	0.20296	-1.53	1.0808	7.14	1.00128	20.4906	-15.40	63.453	2.0	31	604	1247.6	1933	351	822.3	1303	527	8	
99	9	Pią	296	0.24262	-1.36	1.1148	7.37	1.00157	21.3421	-11.19	63.490	3.0	23	601	1247.4	1935	408	905.0	1414	523	9	
100	10	Sob	297	0.28227	-1.20	1.1528	7.59	1.00186	22.1821	-6.33	63.352	4.0	16	559	1247.1	1936	422	946.3	1524	519	10	
101	11	Nie	298	0.32193	-1.04	1.1909	8.21	1.00215	23.0153	-1.30	63.066	5.0	9	557	1246.8	1938	435	1027.0	1634	515	11	
102	12	Pon	299	0.36158	-0.49	1.2250	8.43	1.00243	23.4547	3.39	62.663	6.0	4	554	1246.6	1940	447	1108.1	1745	511	12	
103	13	Wto	300	0.40124	-0.33	1.2631	9.05	1.00272	0.3054	8.45	62.180	7.0	1	552	1246.3	1942	500	1150.4	1858	507	13	
104	14	Śro	301	0.44089	-0.18	1.3013	9.26	1.00300	1.1804	13.36	61.651	8.0	0	550	1246.1	1944	515	1235.0	2013	503	14	
105	15	Czw	302	0.48055	-0.04	1.3355	9.48	1.00328	2.0757	17.55	61.103	0.9	1	547	1245.8	1945	533	1322.6	2130	459	15	
106	16	Pią	303	0.52020	0.10	1.3737	10.09	1.00356	3.0100	21.28	60.560	1.9	4	545	1245.6	1947	557	1413.8	2247	455	16	
107	17	Sob	304	0.55586	0.24	1.4120	10.31	1.00383	3.5712	23.57	60.037	2.9	9	543	1245.3	1949	629	1508.3	2358	451	17	
108	18	Nie	305	0.59552	0.38	1.4503	10.52	1.00411	4.5553	25.07	59.542	3.9	16	541	1245.1	1951	713	1605.5	0**	447	18	
109	19	Pon	306	1.03517	0.51	1.4846	11.12	1.00438	5.5550	24.49	59.078	4.9	25	538	1244.9	1953	811	1703.9	100	443	19	
110	20	Wto	307	1.07483	1.04	1.5230	11.33	1.00465	6.5536	23.01	58.652	5.9	35	536	1244.7	1954	923	1801.7	148	439	20	
111	21	Śro	308	1.11448	1.16	1.5614	11.53	1.00492	7.5356	19.48	58.270	6.9	46	534	1244.5	1956	1045	1857.7	224	436	21	
112	22	Czw	309	1.15414	1.28	1.5959	12.14	1.00518	8.5015	15.25	57.949	0.7	57	532	1244.3	1958	1210	1951.3	251	432	22	
113	23	Pią	310	1.19379	1.39	2.0344	12.34	1.00545	9.4435	10.07	57.709	1.7	69	530	1244.1	2000	1336	2042.9	312	428	23	
114	24	Sob	311	1.23345	1.51	2.0729	12.54	1.00571	10.3729	4.15	57.578	2.7	79	527	1243.9	2002	1502	2133.2	330	424	24	
115	25	Nie	312	1.27310	2.01	2.1115	13.13	1.00597	11.2946	-1.52	57.585	3.7	88	525	1243.7	2003	1628	2223.3	346	420	25	
116	26	Pon	313	1.31276	2.11	2.1502	13.33	1.00623	12.2220	-7.52	57.753	4.7	94	523	1243.6	2005	1754	2314.0	402	416	26	
117	27	Wto	314	1.35241	2.21	2.1848	13.52	1.00650	13.1600	-13.25	58.091	5.7	98	521	1243.4	2007	1921	*****	419	412	27	
118	28	Śro	315	1.39207	2.30	2.2236	14.11	1.00676	14.1115	-18.10	58.594	6.7	100	519	1243.2	2009	2046	006.3	440	408	28	
119	29	Czw	316	1.43172	2.39	2.2624	14.30	1.00702	15.0804	-21.49	59.236	0.9	99	517	1243.1	2010	2206	100.4	506	404	29	
120	30	Pią	317	1.47138	2.47	2.3012	14.48	1.00727	16.0552	-24.09	59.974	1.9	96	515	1243.0	2012	2317	156.0	540	400	30	

Fazy Księżyca [Dm, h.mm]: 3kw 6, 11.37 Nów 14, 14.29 1kw 21, 20.20 Pełn 28, 14.18

KWIECIEŃ 2010 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE			MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST (0 ^h UT)	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach			
1	4.17	21.25	6.40	20.60	6.58	21.07	12.14	4.50	5.51	16.54	17.57	6.30	6.05	17.53	5.15	15.02	2.11	10.52			
	0.709	4.58	1.710	12.23	1.927	11.30	8.394	22.33	23.250	-5.90	12.097	2.17	23.862	-1.68	22.008	-12.65	18.384	-18.12	12.61666	1	
3	4.11	21.30	6.35	21.12	6.54	21.14	12.09	4.43	5.44	16.49	17.48	6.22	5.58	17.46	5.07	14.55	2.03	10.44			
	0.831	5.34	1.901	13.68	2.082	12.23	8.425	22.16	23.279	-5.72	12.088	2.23	23.869	-1.63	22.012	-12.63	18.384	-18.12	12.74808	3	
5	4.05	21.35	6.30	21.22	6.51	21.21	12.04	4.35	5.37	16.44	17.40	6.13	5.50	17.39	4.59	14.47	1.55	10.36			
	0.952	6.11	2.073	14.96	2.239	13.13	8.459	21.98	23.307	-5.54	12.078	2.29	23.876	-1.59	22.015	-12.61	18.384	-18.12	12.87950	5	
7	3.58	21.41	6.24	21.30	6.47	21.28	12.00	4.28	5.30	16.38	17.31	6.05	5.42	17.32	4.51	14.39	1.48	10.28			
	1.074	6.86	2.224	16.06	2.396	14.02	8.495	21.79	23.335	-5.37	12.069	2.35	23.883	-1.55	22.019	-12.59	18.384	-18.11	13.01092	7	
9	3.52	21.46	6.18	21.36	6.43	21.35	11.56	4.21	5.23	16.33	17.22	5.57	5.35	17.24	4.44	14.32	1.40	10.20			
	1.197	7.61	2.353	16.96	2.555	14.88	8.532	21.60	23.363	-5.20	12.060	2.40	23.889	-1.50	22.022	-12.58	18.384	-18.11	13.14234	9	
11	3.46	21.51	6.12	21.39	6.40	21.42	11.52	4.14	5.16	16.28	17.14	5.49	5.27	17.17	4.36	14.24	1.32	10.13			
	1.319	8.35	2.457	17.65	2.714	15.71	8.572	21.40	23.390	-5.02	12.052	2.46	23.896	-1.46	22.026	-12.56	18.384	-18.11	13.27376	11	
13	3.39	21.57	6.06	21.39	6.36	21.49	11.48	4.07	5.09	16.22	17.05	5.41	5.19	17.10	4.28	14.17	1.24	10.05			
	1.442	9.08	2.536	18.14	2.875	16.53	8.613	21.19	23.418	-4.85	12.043	2.51	23.902	-1.42	22.029	-12.54	18.384	-18.11	13.40517	13	
15	3.32	22.03	5.59	21.36	6.33	21.55	11.44	4.01	5.02	16.17	16.56	5.33	5.12	17.03	4.20	14.09	1.16	9.57			
	1.565	9.80	2.588	18.40	3.037	17.31	8.656	20.97	23.445	-4.68	12.035	2.56	23.909	-1.38	22.032	-12.53	18.383	-18.11	13.53659	15	
17	3.25	22.09	5.52	21.30	6.30	22.02	11.41	3.54	4.54	16.12	16.48	5.25	5.04	16.55	4.13	14.02	1.08	9.49			
	1.689	10.51	2.613	18.45	3.200	18.06	8.700	20.75	23.472	-4.52	12.027	2.61	23.915	-1.34	22.035	-12.51	18.382	-18.11	13.66801	17	
19	3.18	22.15	5.46	21.21	6.27	22.09	11.37	3.47	4.47	16.06	16.39	5.17	4.56	16.48	4.05	13.54	1.00	9.41			
	1.813	11.21	2.613	18.29	3.364	18.79	8.747	20.52	23.499	-4.35	12.019	2.66	23.922	-1.30	22.038	-12.50	18.381	-18.10	13.79943	19	
21	3.11	22.21	5.39	21.09	6.25	22.16	11.34	3.40	4.40	16.01	16.30	5.09	4.49	16.41	3.57	13.46	0.52	9.33			
	1.937	11.89	2.590	17.92	3.530	19.48	8.794	20.28	23.525	-4.19	12.011	2.70	23.928	-1.26	22.041	-12.48	18.381	-18.10	13.93085	21	
23	3.04	22.28	5.32	20.55	6.22	22.22	11.31	3.34	4.33	15.56	16.22	5.01	4.41	16.33	3.49	13.39	0.44	9.25			
	2.062	12.56	2.547	17.35	3.696	20.13	8.843	20.03	23.551	-4.02	12.004	2.75	23.934	-1.22	22.043	-12.47	18.379	-18.10	14.06227	23	
25	2.56	22.35	5.25	20.39	6.20	22.29	11.28	3.27	4.26	15.50	16.13	4.53	4.33	16.26	3.41	13.31	0.36	9.17			
	2.188	13.22	2.488	16.63	3.864	20.75	8.893	19.78	23.577	-3.86	11.997	2.79	23.940	-1.18	22.046	-12.46	18.378	-18.10	14.19369	25	
27	2.49	22.42	5.19	20.21	6.18	22.35	11.25	3.20	4.19	15.45	16.05	4.45	4.25	16.19	3.34	13.23	0.28	9.09			
	2.313	13.86	2.419	15.77	4.033	21.34	8.944	19.52	23.603	-3.70	11.990	2.83	23.946	-1.14	22.048	-12.44	18.377	-18.10	14.32510	27	
29	2.41	22.50	5.12	20.03	6.16	22.42	11.22	3.14	4.11	15.39	15.57	4.37	4.18	16.12	3.26	13.16	0.20	9.01			
	2.440	14.49	2.346	14.84	4.203	21.88	8.997	19.25	23.628	-3.55	11.984	2.86	23.952	-1.11	22.050	-12.43	18.375	-18.10	14.45652	29	

MAJ 2010

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2455																					
121	1	Sob	318	1.51104	2.54	2.3401	15.06	1.00753	17.0335	-25.05	60.754	2.9	90	513	1242.8	2014	****	252.1	625	356	1
122	2	Nie	319	1.55069	3.01	2.3751	15.24	1.00779	17.5958	-24.39	61.515	3.9	83	511	1242.7	2016	014	347.2	722	352	2
123	3	Pon	320	1.59035	3.08	2.4141	15.42	1.00805	18.5401	-22.59	62.201	4.9	75	509	1242.6	2017	058	440.0	827	348	3
124	4	Wto	321	2.03000	3.14	2.4532	15.60	1.00830	19.4512	-20.16	62.760	5.9	67	507	1242.5	2019	130	529.7	937	344	4
125	5	Śro	322	2.06566	3.19	2.4923	16.17	1.00855	20.3334	-16.43	63.152	6.9	57	505	1242.4	2021	154	616.3	1048	340	5
126	6	Czw	323	2.10532	3.24	2.5315	16.34	1.00880	21.1933	-12.33	63.353	0.2	48	503	1242.4	2023	212	700.1	1159	337	6
127	7	Pią	324	2.14497	3.28	2.5707	16.50	1.00905	22.0352	-7.56	63.353	1.2	38	501	1242.3	2024	227	742.0	1309	333	7
128	8	Sob	325	2.18463	3.32	3.0060	17.07	1.00929	22.4722	-2.60	63.156	2.2	29	500	1242.2	2026	240	822.7	1418	329	8
129	9	Nie	326	2.22428	3.35	3.0453	17.23	1.00953	23.3055	2.06	62.785	3.2	21	458	1242.2	2028	253	903.4	1529	325	9
130	10	Pon	327	2.26394	3.37	3.0848	17.39	1.00977	0.1529	7.11	62.272	4.2	14	456	1242.1	2029	306	945.0	1640	321	10
131	11	Wto	328	2.30359	3.39	3.1242	17.54	1.01000	1.0158	12.06	61.659	5.2	7	454	1242.1	2031	320	1028.6	1755	317	11
132	12	Śro	329	2.34325	3.40	3.1638	18.09	1.01023	1.5113	16.36	60.995	6.2	3	452	1242.1	2033	337	1115.3	1912	313	12
133	13	Czw	330	2.38290	3.41	3.2034	18.24	1.01046	2.4351	20.25	60.328	7.2	0	451	1242.1	2034	359	1205.6	2029	309	13
134	14	Pią	331	2.42256	3.41	3.2430	18.39	1.01068	3.4002	23.16	59.702	0.4	0	449	1242.1	2036	428	1259.9	2145	305	14
135	15	Sob	332	2.46221	3.40	3.2827	18.53	1.01089	4.3914	24.49	59.153	1.4	2	448	1242.1	2038	509	1357.5	2251	301	15
136	16	Nie	333	2.50187	3.39	3.3225	19.07	1.01110	5.4010	24.53	58.704	2.4	7	446	1242.1	2039	603	1457.0	2345	257	16
137	17	Pon	334	2.54153	3.38	3.3623	19.21	1.01131	6.4108	23.24	58.366	3.4	13	444	1242.1	2041	713	1556.2	****	253	17
138	18	Wto	335	2.58118	3.35	3.4022	19.34	1.01151	7.4036	20.27	58.136	4.4	22	443	1242.2	2042	833	1653.5	025	249	18
139	19	Śro	336	3.02084	3.33	3.4421	19.47	1.01171	8.3738	16.16	58.007	5.4	32	441	1242.2	2044	958	1748.0	055	245	19
140	20	Czw	337	3.06049	3.30	3.4821	19.60	1.01191	9.3210	11.11	57.969	6.4	43	440	1242.3	2046	1124	1839.8	118	242	20
141	21	Pią	338	3.10015	3.26	3.5221	20.12	1.01210	10.2441	5.30	58.013	0.4	55	439	1242.3	2047	1249	1929.6	136	238	21
142	22	Sob	339	3.13581	3.22	3.5622	20.24	1.01228	11.1603	-0.27	58.137	1.4	66	437	1242.4	2049	1413	2018.5	152	234	22
143	23	Nie	340	3.17546	3.17	4.0023	20.36	1.01247	12.0717	-6.21	58.340	2.4	77	436	1242.5	2050	1536	2107.6	208	230	23
144	24	Pon	341	3.21512	3.12	4.0425	20.47	1.01265	12.5917	-11.54	58.628	3.4	85	435	1242.6	2051	1700	2157.9	224	226	24
145	25	Wto	342	3.25477	3.06	4.0827	20.58	1.01283	13.5248	-16.47	59.006	4.4	92	433	1242.6	2053	1824	2250.0	243	222	25
146	26	Śro	343	3.29443	2.60	4.1230	21.09	1.01300	14.4808	-20.42	59.472	5.4	97	432	1242.7	2054	1945	2344.2	306	218	26
147	27	Czw	344	3.33408	2.53	4.1633	21.19	1.01318	15.4500	-23.27	60.018	6.4	100	431	1242.9	2056	2059	*****	337	214	27
148	28	Pią	345	3.37374	2.46	4.2037	21.28	1.01335	16.4234	-24.51	60.623	0.5	100	430	1243.0	2057	2202	039.7	417	210	28
149	29	Sob	346	3.41339	2.38	4.2441	21.38	1.01352	17.3936	-24.52	61.255	1.5	98	429	1243.1	2058	2251	135.2	508	206	29
150	30	Nie	347	3.45305	2.30	4.2845	21.47	1.01368	18.3450	-23.35	61.875	2.5	94	428	1243.2	2059	2328	229.3	611	202	30
151	31	Pon	348	3.49271	2.22	4.3250	21.56	1.01384	19.2726	-21.10	62.439	3.5	88	427	1243.4	2101	2355	320.8	720	158	31

Fazy Księżyca [Dm, h.mm]: 3kw 6, 6.15 Now 14, 3.04 1kw 21, 1.43 Pełn 28, 1.07

MAJ 2010 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	2.32	22.58	5.06	19.45	6.15	22.48	11.19	3.07	4.04	15.34	15.48	4.28	4.10	16.04	3.18	13.08	0.12	8.53		
	2.567	15.11	2.273	13.87	4.374	22.39	9.050	18.98	23.653	-3.39	11.978	2.90	23.957	-1.07	22.053	-12.42	18.374	-18.10	14.58794	1
3	2.24	23.07	4.60	19.28	6.14	22.54	11.16	3.01	3.57	15.28	15.40	4.20	4.02	15.57	3.10	13.00	0.05	8.45		
	2.695	15.70	2.208	12.92	4.546	22.85	9.105	18.70	23.677	-3.24	11.972	2.93	23.963	-1.03	22.055	-12.41	18.372	-18.10	14.71936	3
5	2.14	23.16	4.54	19.12	6.13	22.60	11.14	2.54	3.50	15.22	15.31	4.12	3.55	15.49	3.03	12.53	23.53	8.38		
	2.823	16.28	2.154	12.05	4.718	23.27	9.160	18.41	23.702	-3.09	11.967	2.96	23.968	-1.00	22.057	-12.40	18.370	-18.10	14.85079	5
7	2.04	23.26	4.48	18.57	6.12	23.05	11.11	2.48	3.42	15.17	15.23	4.04	3.47	15.42	2.55	12.45	23.45	8.30		
	2.952	16.84	2.114	11.28	4.892	23.65	9.216	18.11	23.726	-2.94	11.962	2.98	23.973	-0.97	22.058	-12.39	18.368	-18.10	14.98221	7
9	1.53	23.37	4.42	18.44	6.12	23.10	11.09	2.41	3.35	15.11	15.15	3.56	3.39	15.35	2.47	12.37	23.37	8.22		
	3.082	17.38	2.091	10.66	5.066	23.98	9.274	17.81	23.749	-2.80	11.957	3.01	23.979	-0.93	22.060	-12.39	18.366	-18.10	15.11362	9
11	1.41	23.51	4.37	18.33	6.12	23.15	11.06	2.35	3.28	15.05	15.07	3.48	3.31	15.27	2.39	12.30	23.29	8.14		
	3.212	17.90	2.085	10.19	5.241	24.27	9.332	17.50	23.772	-2.65	11.953	3.03	23.984	-0.90	22.061	-12.38	18.364	-18.10	15.24504	11
13	1.26	0.18	4.32	18.24	6.13	23.20	11.04	2.29	3.21	14.60	14.58	3.40	3.24	15.20	2.31	12.22	23.21	8.06		
	3.343	18.41	2.098	9.88	5.417	24.52	9.390	17.18	23.795	-2.51	11.949	3.05	23.989	-0.87	22.063	-12.37	18.361	-18.10	15.37646	13
15	1.14	1.57	4.26	18.18	6.14	23.24	11.02	2.22	3.13	14.54	14.50	3.32	3.16	15.13	2.23	12.14	23.13	7.58		
	3.474	18.89	2.129	9.74	5.593	24.72	9.450	16.86	23.817	-2.38	11.945	3.06	23.993	-0.84	22.064	-12.37	18.359	-18.10	15.50788	15
17	****	****	4.21	18.13	6.16	23.28	10.60	2.16	3.06	14.48	14.42	3.24	3.08	15.05	2.16	12.06	23.05	7.49		
	3.606	19.35	2.178	9.76	5.769	24.87	9.510	16.53	23.839	-2.24	11.942	3.08	23.998	-0.81	22.065	-12.36	18.357	-18.10	15.63930	17
19	****	****	4.16	18.10	6.17	23.32	10.58	2.09	2.59	14.42	14.34	3.16	3.00	14.58	2.08	11.59	22.57	7.41		
	3.739	19.79	2.243	9.93	5.945	24.97	9.571	16.19	23.861	-2.11	11.939	3.09	0.002	-0.78	22.066	-12.36	18.354	-18.10	15.77073	19
21	****	****	4.12	18.09	6.20	23.35	10.56	2.03	2.52	14.36	14.26	3.08	2.53	14.50	1.60	11.51	22.49	7.33		
	3.872	20.20	2.324	10.24	6.121	25.02	9.633	15.84	23.882	-1.98	11.937	3.09	0.007	-0.76	22.067	-12.35	18.351	-18.11	15.90215	21
23	****	****	4.07	18.09	6.22	23.38	10.54	1.57	2.44	14.30	14.18	3.01	2.45	14.43	1.52	11.43	22.41	7.25		
	4.006	20.60	2.420	10.68	6.297	25.03	9.695	15.49	23.902	-1.85	11.935	3.10	0.011	-0.73	22.067	-12.35	18.348	-18.11	16.03357	23
25	****	****	4.02	18.11	6.25	23.40	10.52	1.50	2.37	14.24	14.10	2.53	2.37	14.35	1.44	11.35	22.33	7.17		
	4.141	20.97	2.531	11.23	6.473	24.99	9.757	15.13	23.922	-1.73	11.934	3.10	0.015	-0.71	22.068	-12.35	18.346	-18.11	16.16498	25
27	****	****	3.58	18.14	6.28	23.42	10.50	1.44	2.30	14.18	14.02	2.45	2.29	14.28	1.36	11.27	22.25	7.09		
	4.276	21.31	2.655	11.90	6.648	24.90	9.820	14.77	23.942	-1.61	11.933	3.10	0.019	-0.68	22.068	-12.35	18.343	-18.11	16.29640	27
29	****	****	3.54	18.19	6.32	23.43	10.48	1.38	2.22	14.12	13.54	2.37	2.22	14.20	1.29	11.19	22.17	7.01		
	4.411	21.63	2.793	12.65	6.822	24.77	9.884	14.40	23.961	-1.50	11.932	3.10	0.022	-0.66	22.069	-12.35	18.340	-18.11	16.42782	29
31	****	****	3.51	18.25	6.36	23.44	10.46	1.31	2.15	14.06	13.46	2.29	2.14	14.13	1.21	11.12	22.08	6.53		
	4.547	21.93	2.945	13.48	6.996	24.59	9.948	14.02	23.980	-1.38	11.932	3.09	0.026	-0.64	22.069	-12.35	18.336	-18.12	16.55925	31

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Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2455																			
152	1	Wto	349	3.53236	2.13	4.3656	22.04	1.01401	20.1707	-17.51	62.902	4.5	81	426	1243.5	2102	****	409.1	832	154	1	
153	2	Śro	350	3.57202	2.04	4.4102	22.12	1.01416	21.0406	-13.51	63.225	5.5	73	425	1243.7	2103	016	454.4	943	150	2	
154	3	Czw	351	4.01168	1.54	4.4508	22.19	1.01432	21.4900	-9.20	63.375	6.5	64	424	1243.8	2104	032	537.1	1053	146	3	
155	4	Pią	352	4.05133	1.44	4.4915	22.27	1.01447	22.3235	-4.30	63.332	7.5	55	424	1244.0	2105	046	618.1	1203	143	4	
156	5	Sob	353	4.09099	1.33	4.5322	22.33	1.01461	23.1546	0.31	63.090	0.5	45	423	1244.2	2106	059	658.4	1312	139	5	
157	6	Nie	354	4.13064	1.23	4.5729	22.40	1.01475	23.5930	5.34	62.659	1.5	36	422	1244.4	2107	112	739.2	1422	135	6	
158	7	Pon	355	4.17030	1.12	5.0137	22.46	1.01489	0.4446	10.29	62.062	2.5	27	422	1244.6	2108	125	821.4	1535	131	7	
159	8	Wto	356	4.20595	1.00	5.0545	22.51	1.01502	1.3233	15.06	61.339	3.5	18	421	1244.7	2109	141	906.2	1650	127	8	
160	9	Śro	357	4.24561	0.48	5.0953	22.56	1.01515	2.2340	19.10	60.543	4.5	11	421	1244.9	2110	200	954.5	1807	123	9	
161	10	Czw	358	4.28526	0.36	5.1401	23.01	1.01527	3.1838	22.23	59.733	5.5	5	420	1245.1	2111	225	1047.1	1924	119	10	
162	11	Pią	359	4.32492	0.24	5.1810	23.05	1.01538	4.1719	24.25	58.973	6.5	1	420	1245.3	2111	301	1143.9	2036	115	11	
163	12	Sob	360	4.36458	0.12	5.2219	23.09	1.01549	5.1844	25.01	58.321	7.5	0	419	1245.5	2112	350	1243.8	2136	111	12	
164	13	Nie	361	4.40423	-0.01	5.2628	23.13	1.01559	6.2111	24.00	57.822	0.9	1	419	1245.8	2113	456	1344.8	2222	107	13	
165	14	Pon	362	4.44389	-0.13	5.3038	23.16	1.01569	7.2245	21.24	57.505	1.9	5	419	1246.0	2113	615	1444.6	2257	103	14	
166	15	Wto	363	4.48355	-0.26	5.3447	23.19	1.01578	8.2201	17.26	57.377	2.9	11	419	1246.2	2114	741	1541.8	2322	059	15	
167	16	Śro	364	4.52320	-0.39	5.3856	23.21	1.01587	9.1827	12.25	57.425	3.9	20	419	1246.4	2114	909	1635.7	2342	055	16	
168	17	Czw	365	4.56286	-0.52	5.4306	23.23	1.01595	10.1218	6.45	57.624	4.9	30	419	1246.6	2115	1036	1726.9	****	051	17	
169	18	Pią	366	5.00251	-1.05	5.4716	23.24	1.01603	11.0420	0.47	57.939	5.9	41	419	1246.8	2115	1201	1816.4	000	047	18	
170	19	Sob	367	5.04217	-1.18	5.5125	23.25	1.01610	11.5532	-5.09	58.338	0.2	53	419	1247.1	2116	1324	1905.2	015	044	19	
171	20	Nie	368	5.08182	-1.32	5.5535	23.26	1.01616	12.4656	-10.45	58.792	1.2	64	419	1247.3	2116	1447	1954.5	031	040	20	
172	21	Pon	369	5.12148	-1.45	5.5944	23.26	1.01622	13.3920	-15.44	59.282	2.2	74	419	1247.5	2116	1610	2045.2	049	036	21	
173	22	Wto	370	5.16113	-1.58	6.0354	23.26	1.01628	14.3317	-19.51	59.794	3.2	83	419	1247.7	2116	1730	2137.7	110	032	22	
174	23	Śro	371	5.20079	-2.10	6.0803	23.26	1.01633	15.2848	-22.51	60.320	4.2	90	419	1247.9	2116	1846	2231.7	137	028	23	
175	24	Czw	372	5.24045	-2.23	6.1213	23.25	1.01638	16.2522	-24.36	60.856	5.2	96	420	1248.1	2116	1952	2326.5	213	024	24	
176	25	Pią	373	5.28010	-2.36	6.1622	23.23	1.01643	17.2159	-25.01	61.392	6.2	99	420	1248.3	2116	2046	*****	300	020	25	
177	26	Sob	374	5.31576	-2.49	6.2031	23.21	1.01647	18.1726	-24.07	61.915	7.2	100	421	1248.6	2116	2127	020.7	358	016	26	
178	27	Nie	375	5.35541	-3.01	6.2440	23.19	1.01651	19.1045	-22.02	62.407	0.9	99	421	1248.8	2116	2157	113.0	504	012	27	
179	28	Pon	376	5.39507	-3.13	6.2849	23.16	1.01655	20.0122	-18.58	62.842	1.9	96	422	1249.0	2116	2220	202.6	615	008	28	
180	29	Wto	377	5.43473	-3.25	6.3258	23.13	1.01658	20.4916	-15.08	63.189	2.9	92	422	1249.2	2116	2238	249.0	727	004	29	
181	30	Śro	378	5.47438	-3.37	6.3706	23.10	1.01661	21.3451	-10.45	63.420	3.9	86	423	1249.4	2116	2253	332.7	839	000	30	

Fazy Księżyca [Dm, h.mm]: 3kw 5, 0.13 Nów 12, 13.14 1kw 19, 6.29 Pełn 26, 13.30

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Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	*****	*****	3.49	18.29	6.38	23.45	10.45	1.28	2.11	14.03	13.42	2.25	2.10	14.09	1.17	11.08	22.04	6.49		
	4.616	22.07	3.025	13.92	7.082	24.48	9.980	13.83	23.989	-1.33	11.932	3.09	0.027	-0.63	22.069	-12.35	18.335	-18.12	16.62496	1
3	*****	*****	3.46	18.37	6.43	23.45	10.44	1.22	2.04	13.57	13.35	2.17	2.02	14.01	1.09	10.60	21.56	6.41		
	4.752	22.32	3.197	14.84	7.255	24.23	10.045	13.44	0.007	-1.22	11.932	3.08	0.031	-0.61	22.069	-12.35	18.332	-18.12	16.75638	3
5	*****	*****	3.43	18.46	6.48	23.45	10.42	1.16	1.57	13.50	13.27	2.09	1.54	13.54	1.01	10.52	21.48	6.33		
	4.889	22.55	3.381	15.82	7.426	23.94	10.110	13.05	0.024	-1.12	11.933	3.06	0.034	-0.59	22.068	-12.35	18.328	-18.12	16.88780	5
7	*****	*****	3.40	18.56	6.53	23.45	10.41	1.09	1.49	13.44	13.19	2.01	1.47	13.46	0.53	10.44	21.40	6.25		
	5.027	22.76	3.579	16.82	7.596	23.60	10.176	12.65	0.041	-1.02	11.934	3.05	0.037	-0.57	22.068	-12.36	18.325	-18.13	17.01922	7
9	*****	*****	3.38	19.08	6.58	23.44	10.39	1.03	1.42	13.38	13.12	1.53	1.39	13.38	0.45	10.36	21.32	6.17		
	5.165	22.94	3.792	17.85	7.764	23.22	10.242	12.25	0.057	-0.92	11.936	3.03	0.039	-0.56	22.067	-12.36	18.322	-18.13	17.15064	9
11	*****	*****	3.37	19.20	7.03	23.43	10.38	0.57	1.34	13.31	13.04	1.45	1.31	13.31	0.37	10.28	21.24	6.09		
	5.303	23.09	4.019	18.87	7.932	22.80	10.308	11.84	0.073	-0.83	11.938	3.01	0.042	-0.54	22.067	-12.36	18.318	-18.13	17.28206	11
13	*****	*****	3.37	19.34	7.09	23.41	10.36	0.51	1.27	13.25	12.56	1.38	1.23	13.23	0.30	10.20	21.16	6.01		
	5.441	23.21	4.261	19.88	8.098	22.34	10.375	11.42	0.088	-0.74	11.940	2.98	0.044	-0.53	22.066	-12.37	18.315	-18.14	17.41348	13
15	*****	*****	3.38	19.48	7.15	23.40	10.35	0.44	1.20	13.18	12.49	1.30	1.15	13.16	0.22	10.12	21.08	5.53		
	5.580	23.31	4.518	20.85	8.262	21.84	10.442	11.00	0.102	-0.65	11.943	2.96	0.046	-0.51	22.065	-12.37	18.311	-18.14	17.54491	15
17	*****	*****	3.40	20.03	7.20	23.37	10.33	0.38	1.12	13.12	12.41	1.22	1.08	13.08	0.14	10.04	21.00	5.44		
	5.718	23.38	4.789	21.75	8.425	21.30	10.509	10.57	0.116	-0.57	11.946	2.93	0.048	-0.50	22.064	-12.38	18.308	-18.15	17.67633	17
19	*****	*****	3.43	20.19	7.26	23.35	10.32	0.32	1.05	13.05	12.34	1.14	0.60	13.00	0.06	9.56	20.52	5.36		
	5.857	23.42	5.075	22.57	8.586	20.72	10.577	10.14	0.129	-0.50	11.950	2.90	0.050	-0.49	22.063	-12.39	18.304	-18.15	17.80775	19
21	*****	*****	3.47	20.34	7.32	23.32	10.31	0.25	0.57	12.58	12.26	1.06	0.52	12.52	23.54	9.48	20.44	5.28		
	5.996	23.44	5.373	23.27	8.745	20.11	10.645	9.70	0.142	-0.43	11.954	2.86	0.051	-0.49	22.062	-12.40	18.301	-18.15	17.93917	21
23	*****	*****	3.53	20.49	7.38	23.30	10.29	0.19	0.50	12.51	12.19	0.59	0.44	12.45	23.46	9.40	20.36	5.20		
	6.134	23.43	5.681	23.84	8.903	19.47	10.713	9.26	0.154	-0.36	11.958	2.83	0.053	-0.48	22.060	-12.40	18.297	-18.16	18.07059	23
25	*****	*****	4.01	21.03	7.44	23.26	10.28	0.13	0.42	12.44	12.12	0.51	0.36	12.37	23.38	9.32	20.28	5.12		
	6.273	23.38	5.997	24.23	9.058	18.79	10.782	8.81	0.165	-0.30	11.963	2.79	0.054	-0.47	22.059	-12.41	18.294	-18.16	18.20201	25
27	*****	*****	4.11	21.16	7.50	23.23	10.27	0.07	0.35	12.38	12.04	0.43	0.28	12.29	23.30	9.24	20.20	5.04		
	6.411	23.32	6.317	24.45	9.212	18.09	10.851	8.36	0.176	-0.24	11.969	2.75	0.055	-0.47	22.057	-12.42	18.290	-18.17	18.33344	27
29	*****	*****	4.22	21.28	7.57	23.19	10.26	23.56	0.27	12.31	11.57	0.35	0.21	12.21	23.22	9.16	20.12	4.56		
	6.549	23.22	6.638	24.48	9.365	17.35	10.920	7.90	0.186	-0.18	11.974	2.70	0.055	-0.46	22.055	-12.43	18.287	-18.17	18.46486	29

LIPIEC 2010

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2455																					
182	1	Czw	379	5.51404	-3.49	6.4114	23.06	1.01664	22.1846	-6.00	63.503	4.9	79	424	1249.6	2115	2306	414.4	948	2352	1
183	2	Pią	380	5.55369	-4.00	6.4522	23.02	1.01666	23.0150	-1.03	63.416	5.9	71	424	1249.8	2115	2318	454.8	1057	2349	2
184	3	Sob	381	5.59335	-4.12	6.4930	22.57	1.01668	23.4457	3.58	63.144	6.9	61	425	1249.9	2114	2331	534.9	1206	2345	3
185	4	Nie	382	6.03300	-4.22	6.5338	22.52	1.01669	0.2903	8.53	62.684	7.9	52	426	1250.1	2114	2345	615.9	1317	2341	4
186	5	Pon	383	6.07266	-4.33	6.5745	22.46	1.01670	1.1506	13.33	62.049	0.8	42	427	1250.3	2113	****	658.7	1429	2337	5
187	6	Wto	384	6.11231	-4.43	7.0151	22.41	1.01670	2.0404	17.46	61.267	1.8	32	428	1250.5	2113	002	744.5	1544	2333	6
188	7	Śro	385	6.15197	-4.53	7.0558	22.34	1.01670	2.5639	21.17	60.384	2.8	23	429	1250.6	2112	024	834.2	1700	2329	7
189	8	Czw	386	6.19163	-5.03	7.1004	22.28	1.01669	3.5312	23.47	59.460	3.8	15	430	1250.8	2111	054	928.3	1814	2325	8
190	9	Pią	387	6.23128	-5.12	7.1410	22.21	1.01668	4.5317	24.59	58.565	4.8	8	431	1250.9	2111	136	1026.4	1920	2321	9
191	10	Sob	388	6.27094	-5.21	7.1815	22.13	1.01666	5.5540	24.37	57.774	5.8	3	432	1251.1	2110	234	1127.2	2014	2317	10
192	11	Nie	389	6.31060	-5.29	7.2220	22.05	1.01663	6.5830	22.37	57.155	6.8	0	433	1251.2	2109	348	1228.5	2054	2313	11
193	12	Pon	390	6.35025	-5.37	7.2624	21.57	1.01660	7.5958	19.04	56.761	0.6	1	434	1251.4	2108	513	1328.4	2124	2309	12
194	13	Wto	391	6.38591	-5.44	7.3028	21.49	1.01656	8.5859	14.16	56.618	1.6	4	435	1251.5	2107	644	1425.5	2146	2305	13
195	14	Śro	392	6.42556	-5.51	7.3432	21.40	1.01652	9.5519	8.36	56.726	2.6	10	436	1251.6	2106	814	1519.5	2205	2301	14
196	15	Czw	393	6.46522	-5.58	7.3835	21.30	1.01647	10.4925	2.30	57.057	3.6	18	438	1251.7	2105	943	1611.2	2222	2257	15
197	16	Pią	394	6.50487	-6.04	7.4237	21.21	1.01641	11.4208	-3.38	57.563	4.6	28	439	1251.8	2104	1109	1701.5	2238	2253	16
198	17	Sob	395	6.54453	-6.09	7.4639	21.11	1.01635	12.3426	-9.27	58.189	5.6	39	440	1251.9	2103	1234	1751.6	2256	2250	17
199	18	Nie	396	6.58418	-6.14	7.5041	21.00	1.01628	13.2710	-14.40	58.880	6.6	50	442	1252.0	2101	1358	1842.3	2316	2246	18
200	19	Pon	397	7.02384	-6.18	7.5441	20.50	1.01621	14.2055	-18.60	59.588	1.0	61	443	1252.0	2100	1519	1934.3	2341	2242	19
201	20	Wto	398	7.06350	-6.22	7.5842	20.38	1.01613	15.1554	-22.16	60.279	2.0	71	444	1252.1	2059	1636	2027.6	****	2238	20
202	21	Śro	399	7.10315	-6.25	8.0241	20.27	1.01605	16.1147	-24.18	60.928	3.0	80	446	1252.2	2058	1745	2121.7	013	2234	21
203	22	Czw	400	7.14281	-6.27	8.0640	20.15	1.01597	17.0750	-25.02	61.524	4.0	88	447	1252.2	2056	1842	2215.5	056	2230	22
204	23	Pią	401	7.18246	-6.29	8.1039	20.03	1.01588	18.0302	-24.28	62.059	5.0	93	449	1252.2	2055	1927	2307.9	150	2226	23
205	24	Sob	402	7.22212	-6.31	8.1437	19.51	1.01579	18.5627	-22.43	62.530	6.0	97	450	1252.3	2053	2000	2357.9	253	2222	24
206	25	Nie	403	7.26178	-6.31	8.1834	19.38	1.01570	19.4729	-19.55	62.931	7.0	100	452	1252.3	2052	2025	*****	403	2218	25
207	26	Pon	404	7.30143	-6.32	8.2231	19.25	1.01560	20.3557	-16.18	63.257	0.3	100	453	1252.3	2050	2044	045.2	514	2214	26
208	27	Wto	405	7.34109	-6.31	8.2627	19.11	1.01550	21.2206	-12.05	63.494	1.3	98	455	1252.3	2049	2100	129.8	625	2210	27
209	28	Śro	406	7.38074	-6.30	8.3022	18.57	1.01539	22.0626	-7.25	63.626	2.3	95	456	1252.2	2047	2114	212.1	736	2206	28
210	29	Czw	407	7.42040	-6.28	8.3417	18.43	1.01529	22.4940	-2.31	63.635	3.3	90	458	1252.2	2046	2126	252.8	845	2202	29
211	30	Pią	408	7.46005	-6.26	8.3812	18.29	1.01518	23.3235	2.29	63.503	4.3	84	459	1252.2	2044	2139	332.9	953	2158	30
212	31	Sob	409	7.49571	-6.23	8.4205	18.14	1.01506	0.1600	7.24	63.213	5.3	76	501	1252.1	2042	2153	413.2	1103	2154	31

Fazy Księżyca [Dm, h.mm]: 3kw 4, 16.35 Now 11, 21.40 1kw 18, 12.10 Pełn 26, 3.36

LIPIEC 2010 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	*****	*****	4.34	21.38	8.03	23.16	10.25	23.50	0.19	12.23	11.50	0.27	0.13	12.13	23.15	9.08	20.04	4.48		
	6.687	23.10	6.955	24.33	9.515	16.59	10.990	7.44	0.195	-0.14	11.980	2.66	0.056	-0.46	22.053	-12.45	18.283	-18.18	18.59628	1
3	*****	*****	4.47	21.46	8.09	23.12	10.23	23.44	0.12	12.16	11.42	0.20	0.05	12.06	23.07	9.00	19.56	4.40		
	6.825	22.95	7.265	24.00	9.664	15.81	11.059	6.97	0.203	-0.09	11.986	2.61	0.056	-0.46	22.051	-12.46	18.279	-18.19	18.72770	3
5	*****	*****	5.02	21.52	8.15	23.08	10.22	23.38	0.04	12.09	11.35	0.12	23.53	11.58	22.59	8.52	19.48	4.31		
	6.962	22.77	7.567	23.50	9.810	14.99	11.129	6.50	0.211	-0.05	11.993	2.56	0.056	-0.46	22.049	-12.47	18.276	-18.19	18.85912	5
7	*****	*****	5.16	21.57	8.20	23.03	10.21	23.31	23.53	12.02	11.28	0.04	23.45	11.50	22.51	8.44	19.40	4.23		
	7.099	22.57	7.858	22.85	9.956	14.16	11.200	6.03	0.218	-0.02	12.000	2.50	0.056	-0.46	22.047	-12.48	18.272	-18.20	18.99054	7
9	*****	*****	5.31	21.59	8.26	22.59	10.20	23.25	23.45	11.55	11.21	23.53	23.37	11.42	22.43	8.36	19.32	4.15		
	7.236	22.34	8.137	22.07	10.099	13.31	11.270	5.55	0.224	0.01	12.008	2.45	0.056	-0.46	22.045	-12.50	18.269	-18.20	19.12196	9
11	*****	*****	5.46	22.01	8.32	22.54	10.19	23.19	23.37	11.47	11.14	23.45	23.30	11.34	22.35	8.28	19.24	4.07		
	7.372	22.09	8.404	21.18	10.241	12.43	11.341	5.07	0.229	0.04	12.015	2.39	0.056	-0.47	22.042	-12.51	18.266	-18.21	19.25338	11
13	*****	*****	6.00	22.01	8.38	22.50	10.18	23.13	23.30	11.40	11.07	23.37	23.22	11.26	22.27	8.20	19.16	3.59		
	7.508	21.81	8.658	20.20	10.381	11.54	11.412	4.58	0.234	0.05	12.023	2.33	0.055	-0.47	22.040	-12.52	18.262	-18.22	19.38481	13
15	*****	*****	6.14	22.01	8.43	22.45	10.17	23.07	23.22	11.32	10.60	23.30	23.14	11.18	22.19	8.12	19.08	3.51		
	7.643	21.51	8.900	19.14	10.519	10.63	11.484	4.09	0.238	0.07	12.032	2.27	0.054	-0.48	22.037	-12.54	18.259	-18.22	19.51622	15
17	*****	*****	6.27	21.59	8.49	22.40	10.16	23.00	23.14	11.24	10.53	23.22	23.06	11.10	22.11	8.03	18.60	3.43		
	7.778	21.18	9.129	18.02	10.656	9.71	11.555	3.60	0.241	0.08	12.040	2.21	0.053	-0.49	22.034	-12.55	18.256	-18.23	19.64764	17
19	*****	*****	6.40	21.57	8.55	22.35	10.15	22.54	23.06	11.17	10.46	23.14	22.58	11.02	22.03	7.55	18.52	3.35		
	7.912	20.83	9.347	16.85	10.791	8.77	11.627	3.11	0.243	0.08	12.050	2.14	0.052	-0.50	22.031	-12.57	18.252	-18.24	19.77906	19
21	*****	*****	6.52	21.53	8.60	22.30	10.15	22.48	22.59	11.09	10.39	23.07	22.50	10.54	21.55	7.47	18.44	3.27		
	8.045	20.45	9.552	15.65	10.925	7.83	11.700	2.61	0.245	0.08	12.059	2.08	0.051	-0.51	22.029	-12.59	18.249	-18.24	19.91048	21
23	*****	*****	7.03	21.50	9.05	22.25	10.14	22.42	22.51	11.01	10.32	22.59	22.42	10.46	21.47	7.39	18.36	3.18		
	8.177	20.05	9.747	14.42	11.057	6.87	11.772	2.11	0.245	0.07	12.069	2.01	0.049	-0.52	22.026	-12.60	18.246	-18.25	20.04190	23
25	*****	*****	7.14	21.45	9.10	22.19	10.13	22.36	22.43	10.53	10.25	22.51	22.34	10.38	21.39	7.31	18.28	3.10		
	8.309	19.63	9.930	13.18	11.188	5.90	11.845	1.60	0.245	0.06	12.078	1.94	0.047	-0.53	22.023	-12.62	18.243	-18.26	20.17333	25
27	*****	*****	7.24	21.40	9.16	22.14	10.12	22.29	22.35	10.45	10.18	22.44	22.26	10.30	21.31	7.23	18.20	3.02		
	8.441	19.19	10.103	11.94	11.318	4.93	11.919	1.10	0.244	0.05	12.089	1.86	0.045	-0.55	22.020	-12.64	18.240	-18.26	20.30475	27
29	1.09	0.05	7.33	21.35	9.21	22.08	10.11	22.23	22.27	10.37	10.11	22.36	22.19	10.22	21.23	7.15	18.12	2.54		
	8.571	18.72	10.265	10.71	11.446	3.95	11.992	0.59	0.243	0.02	12.099	1.79	0.043	-0.56	22.016	-12.65	18.237	-18.27	20.43617	29
31	1.34	-0.05	7.41	21.29	9.26	22.03	10.11	22.17	22.20	10.29	10.05	22.28	22.11	10.14	21.15	7.06	18.04	2.46		
	8.702	18.24	10.417	9.49	11.572	2.97	12.066	0.08	0.240	0.00	12.110	1.71	0.041	-0.58	22.013	-12.67	18.235	-18.28	20.56758	31

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Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]								
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.			
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
2455																						
213	1	Nie	410	7.53536	-6.20	8.4559	17.59	1.01495	1.0051	12.06	62.756	6.3	67	503	1252.1	2040	2208	454.7	1213	2151	1	
214	2	Pon	411	7.57502	-6.16	8.4951	17.44	1.01483	1.4758	16.24	62.133	7.3	58	504	1252.0	2039	2228	538.5	1326	2147	2	
215	3	Wto	412	8.01467	-6.11	8.5343	17.29	1.01470	2.3808	20.06	61.360	0.2	48	506	1251.9	2037	2253	625.4	1440	2143	3	
216	4	Śro	413	8.05433	-6.06	8.5734	17.13	1.01457	3.3153	22.55	60.468	1.2	38	507	1251.8	2035	2328	716.1	1553	2139	4	
217	5	Czw	414	8.09399	-6.00	9.0125	16.57	1.01444	4.2915	24.37	59.505	2.2	28	509	1251.8	2033	****	810.9	1702	2135	5	
218	6	Pią	415	8.13364	-5.54	9.0516	16.40	1.01430	5.2933	24.55	58.537	3.2	18	511	1251.6	2031	016	909.2	1801	2131	6	
219	7	Sob	416	8.17330	-5.47	9.0905	16.24	1.01415	6.3126	23.39	57.640	4.2	10	512	1251.5	2029	121	1009.5	1847	2127	7	
220	8	Nie	417	8.21295	-5.40	9.1254	16.07	1.01400	7.3317	20.47	56.894	5.2	4	514	1251.4	2028	240	1109.9	1921	2123	8	
221	9	Pon	418	8.25261	-5.32	9.1643	15.49	1.01385	8.3343	16.29	56.371	6.2	1	516	1251.3	2026	409	1208.6	1948	2119	9	
222	10	Wto	419	8.29227	-5.23	9.2031	15.32	1.01369	9.3203	11.05	56.124	0.3	0	517	1251.1	2024	541	1305.1	2009	2115	10	
223	11	Śro	420	8.33192	-5.14	9.2418	15.14	1.01352	10.2821	4.59	56.173	1.3	3	519	1251.0	2022	713	1359.4	2027	2111	11	
224	12	Czw	421	8.37158	-5.04	9.2805	14.56	1.01335	11.2311	-1.21	56.506	2.3	8	521	1250.8	2020	843	1452.0	2044	2107	12	
225	13	Pią	422	8.41123	-4.53	9.3151	14.38	1.01317	12.1718	-7.29	57.079	3.3	16	523	1250.6	2018	1011	1544.0	2101	2103	13	
226	14	Sob	423	8.45089	-4.43	9.3536	14.20	1.01299	13.1132	-13.05	57.828	4.3	25	524	1250.5	2015	1139	1636.1	2121	2059	14	
227	15	Nie	424	8.49054	-4.31	9.3921	14.01	1.01280	14.0625	-17.49	58.679	5.3	35	526	1250.3	2013	1303	1729.1	2145	2056	15	
228	16	Pon	425	8.53020	-4.19	9.4306	13.42	1.01261	15.0210	-21.26	59.563	6.3	46	528	1250.1	2011	1424	1823.1	2216	2052	16	
229	17	Wto	426	8.56585	-4.06	9.4650	13.23	1.01242	15.5832	-23.49	60.420	0.7	57	529	1249.9	2009	1537	1917.6	2255	2048	17	
230	18	Śro	427	9.00551	-3.53	9.5033	13.04	1.01222	16.5451	-24.52	61.209	1.7	67	531	1249.6	2007	1638	2011.7	2346	2044	18	
231	19	Czw	428	9.04516	-3.40	9.5416	12.44	1.01202	17.5014	-24.37	61.901	2.7	76	533	1249.4	2005	1726	2104.5	****	2040	19	
232	20	Pią	429	9.08482	-3.26	9.5759	12.25	1.01182	18.4351	-23.09	62.481	3.7	84	535	1249.2	2003	1803	2155.0	046	2036	20	
233	21	Sob	430	9.12448	-3.11	10.0141	12.05	1.01161	19.3509	-20.39	62.946	4.7	90	536	1248.9	2000	1830	2242.8	153	2032	21	
234	22	Nie	431	9.16413	-2.56	10.0522	11.45	1.01140	20.2358	-17.16	63.298	5.7	95	538	1248.7	1958	1851	2327.9	304	2028	22	
235	23	Pon	432	9.20379	-2.40	10.0903	11.24	1.01119	21.1030	-13.13	63.541	6.7	98	540	1248.4	1956	1908	****	415	2024	23	
236	24	Wto	433	9.24344	-2.24	10.1244	11.04	1.01098	21.5512	-8.41	63.680	7.7	100	541	1248.2	1954	1922	010.8	525	2020	24	
237	25	Śro	434	9.28310	-2.08	10.1624	10.43	1.01076	22.3843	-3.51	63.714	0.7	100	543	1247.9	1951	1935	052.0	634	2016	25	
238	26	Czw	435	9.32275	-1.51	10.2004	10.23	1.01055	23.2144	1.07	63.642	1.7	97	545	1247.6	1949	1948	132.3	743	2012	26	
239	27	Pią	436	9.36241	-1.34	10.2343	10.02	1.01033	0.0501	6.03	63.456	2.7	94	546	1247.3	1947	2001	212.5	852	2008	27	
240	28	Sob	437	9.40206	-1.16	10.2722	9.41	1.01011	0.4921	10.48	63.147	3.7	88	548	1247.0	1945	2016	253.6	1002	2004	28	
241	29	Nie	438	9.44172	-0.58	10.3100	9.19	1.00989	1.3531	15.10	62.708	4.7	81	550	1246.7	1942	2034	336.3	1113	2000	29	
242	30	Pon	439	9.48137	-0.40	10.3439	8.58	1.00966	2.2411	18.59	62.135	5.7	73	552	1246.4	1940	2057	421.5	1225	1957	30	
243	31	Wto	440	9.52103	-0.21	10.3817	8.36	1.00943	3.1552	22.01	61.432	6.7	63	553	1246.1	1938	2127	509.8	1338	1953	31	

Fazy Księżyca [Dm, h.mm]: 3kw 3, 6.59 Now 10, 5.08 1kw 16, 20.14 Pełn 24, 19.05

SIERPIEŃ 2010 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	1.42	23.56	7.45	21.26	9.28	22.00	10.10	22.14	22.16	10.25	10.01	22.25	22.07	10.10	21.11	7.02	17.60	2.42		
	8.766	17.99	10.488	8.89	11.635	2.47	12.103	-0.17	0.239	-0.02	12.115	1.68	0.040	-0.59	22.012	-12.68	18.233	-18.28	20.63329	1
3	1.56	23.43	7.51	21.20	9.33	21.54	10.10	22.08	22.08	10.17	9.54	22.17	21.59	10.02	21.04	6.54	17.52	2.34		
	8.895	17.48	10.623	7.71	11.760	1.49	12.177	-0.69	0.235	-0.05	12.127	1.60	0.037	-0.60	22.008	-12.70	18.231	-18.29	20.76471	3
5	2.07	23.32	7.57	21.13	9.38	21.49	10.09	22.02	21.60	10.08	9.48	22.09	21.51	9.54	20.56	6.46	17.44	2.26		
	9.024	16.94	10.747	6.58	11.883	0.50	12.252	-1.20	0.230	-0.09	12.138	1.52	0.034	-0.62	22.005	-12.72	18.228	-18.30	20.89613	5
7	2.17	23.22	8.02	21.06	9.42	21.43	10.08	21.56	21.52	9.60	9.41	22.02	21.43	9.46	20.48	6.38	17.36	2.18		
	9.151	16.39	10.859	5.49	12.005	-0.49	12.327	-1.72	0.225	-0.14	12.150	1.44	0.031	-0.64	22.002	-12.74	18.226	-18.31	21.02756	7
9	2.27	23.13	8.05	20.59	9.47	21.37	10.08	21.50	21.44	9.51	9.34	21.54	21.35	9.37	20.40	6.30	17.28	2.10		
	9.279	15.82	10.958	4.47	12.126	-1.47	12.403	-2.23	0.219	-0.19	12.162	1.36	0.028	-0.66	21.998	-12.76	18.223	-18.32	21.15898	9
11	2.35	23.04	8.08	20.51	9.52	21.31	10.07	21.43	21.36	9.43	9.27	21.47	21.27	9.29	20.32	6.22	17.20	2.02		
	9.405	15.24	11.044	3.53	12.246	-2.46	12.479	-2.75	0.212	-0.24	12.174	1.27	0.025	-0.68	21.995	-12.77	18.221	-18.32	21.29040	11
13	2.43	22.56	8.09	20.43	9.56	21.25	10.07	21.37	21.28	9.34	9.21	21.39	21.19	9.21	20.24	6.13	17.12	1.54		
	9.531	14.64	11.115	2.68	12.364	-3.44	12.555	-3.27	0.204	-0.30	12.186	1.19	0.022	-0.71	21.991	-12.79	18.219	-18.33	21.42181	13
15	2.51	22.48	8.08	20.34	10.00	21.19	10.06	21.31	21.20	9.25	9.14	21.31	21.11	9.13	20.16	6.05	17.04	1.46		
	9.656	14.02	11.169	1.93	12.481	-4.41	12.632	-3.78	0.196	-0.36	12.199	1.10	0.018	-0.73	21.988	-12.81	18.217	-18.34	21.55323	15
17	2.58	22.40	8.06	20.25	10.05	21.13	10.06	21.25	21.12	9.17	9.07	21.24	21.03	9.05	20.08	5.57	16.56	1.38		
	9.781	13.39	11.206	1.32	12.596	-5.37	12.709	-4.30	0.187	-0.43	12.211	1.02	0.015	-0.75	21.984	-12.83	18.215	-18.35	21.68465	17
19	3.05	22.32	8.01	20.16	10.09	21.07	10.05	21.19	21.04	9.08	9.01	21.16	20.55	8.56	19.60	5.49	16.48	1.30		
	9.905	12.74	11.224	0.85	12.710	-6.33	12.786	-4.82	0.177	-0.50	12.224	0.93	0.011	-0.78	21.981	-12.85	18.213	-18.36	21.81607	19
21	3.11	22.25	7.55	20.06	10.13	21.00	10.05	21.13	20.56	8.59	8.54	21.09	20.47	8.48	19.52	5.41	16.40	1.22		
	10.028	12.08	11.221	0.56	12.823	-7.28	12.864	-5.34	0.167	-0.58	12.237	0.84	0.007	-0.81	21.977	-12.87	18.211	-18.36	21.94749	21
23	3.18	22.18	7.46	19.57	10.17	20.54	10.04	21.07	20.48	8.50	8.48	21.01	20.39	8.40	19.44	5.32	16.32	1.14		
	10.151	11.41	11.196	0.47	12.934	-8.21	12.942	-5.85	0.156	-0.66	12.251	0.75	0.003	-0.83	21.974	-12.89	18.210	-18.37	22.07891	23
25	3.24	22.11	7.35	19.47	10.20	20.48	10.04	21.01	20.39	8.41	8.41	20.54	20.31	8.32	19.36	5.24	16.24	1.06		
	10.273	10.72	11.150	0.59	13.044	-9.13	13.021	-6.37	0.144	-0.74	12.264	0.66	23.999	-0.86	21.970	-12.91	18.208	-18.38	22.21033	25
27	3.29	22.04	7.21	19.37	10.24	20.41	10.04	20.55	20.31	8.32	8.35	20.46	20.23	8.23	19.28	5.16	16.17	0.58		
	10.395	10.03	11.082	0.94	13.151	-10.04	13.100	-6.89	0.132	-0.83	12.278	0.57	23.995	-0.89	21.967	-12.93	18.207	-18.39	22.34175	27
29	3.35	21.57	7.05	19.27	10.28	20.35	10.03	20.50	20.23	8.23	8.28	20.39	20.15	8.15	19.20	5.08	16.09	0.50		
	10.517	9.32	10.996	1.52	13.257	-10.93	13.180	-7.40	0.119	-0.92	12.292	0.48	23.991	-0.92	21.963	-12.95	18.206	-18.40	22.47316	29
31	3.41	21.50	6.47	19.17	10.31	20.28	10.03	20.44	20.15	8.14	8.21	20.31	20.07	8.07	19.12	4.60	16.01	0.42		
	10.638	8.61	10.895	2.31	13.361	-11.80	13.260	-7.91	0.106	-1.01	12.306	0.38	23.986	-0.95	21.960	-12.96	18.205	-18.41	22.60458	31

WRZESIEŃ 2010

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 10 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
244	1	Śro	441	9.56068	-0.03	10.4154	8.15	1.00920	4.1042	24.02	60.615	7.7	53	555	1245.8	1935	2209	601.7	1447	1949	1
245	2	Czw	442	10.00034	0.17	10.4532	7.53	1.00897	5.0820	24.48	59.716	0.7	43	557	1245.5	1933	2304	656.8	1548	1945	2
246	3	Pią	443	10.03599	0.36	10.4909	7.31	1.00874	6.0752	24.09	58.782	1.7	32	558	1245.1	1931	****	754.4	1638	1941	3
247	4	Sob	444	10.07565	0.56	10.5246	7.09	1.00850	7.0804	22.00	57.877	2.7	22	600	1244.8	1928	014	852.9	1717	1937	4
248	5	Nie	445	10.11531	1.16	10.5623	6.47	1.00826	8.0744	18.24	57.077	3.7	13	602	1244.5	1926	137	951.0	1746	1933	5
249	6	Pon	446	10.15496	1.36	10.5959	6.24	1.00801	9.0608	13.34	56.458	4.7	6	604	1244.2	1924	305	1047.7	1810	1929	6
250	7	Wto	447	10.19462	1.56	11.0335	6.02	1.00776	10.0306	7.48	56.089	5.7	2	605	1243.8	1921	436	1142.8	1829	1925	7
251	8	Śro	448	10.23427	2.16	11.0711	5.39	1.00751	10.5856	1.32	56.012	6.7	0	607	1243.5	1919	608	1236.6	1847	1921	8
252	9	Czw	449	10.27393	2.37	11.1047	5.17	1.00725	11.5418	-4.49	56.242	1.0	1	609	1243.1	1916	738	1329.9	1905	1917	9
253	10	Pią	450	10.31358	2.58	11.1423	4.54	1.00700	12.4954	-10.47	56.753	2.0	6	610	1242.8	1914	908	1423.5	1925	1913	10
254	11	Sob	451	10.35324	3.19	11.1759	4.31	1.00673	13.4615	-16.01	57.492	3.0	13	612	1242.4	1912	1037	1518.0	1948	1909	11
255	12	Nie	452	10.39289	3.40	11.2134	4.08	1.00647	14.4331	-20.09	58.384	4.0	21	614	1242.1	1909	1202	1613.6	2016	1905	12
256	13	Pon	453	10.43255	4.01	11.2509	3.45	1.00620	15.4123	-23.01	59.349	5.0	31	616	1241.7	1907	1321	1709.6	2054	1901	13
257	14	Wto	454	10.47220	4.22	11.2845	3.22	1.00593	16.3908	-24.29	60.310	6.0	41	617	1241.4	1904	1428	1805.3	2141	1858	14
258	15	Śro	455	10.51186	4.44	11.3220	2.59	1.00565	17.3546	-24.36	61.205	0.2	52	619	1241.0	1902	1522	1859.5	2239	1854	15
259	16	Czw	456	10.55151	5.05	11.3555	2.36	1.00538	18.3025	-23.26	61.986	1.2	62	621	1240.7	1900	1603	1951.3	2345	1850	16
260	17	Pią	457	10.59117	5.27	11.3930	2.13	1.00510	19.2232	-21.11	62.627	2.2	71	622	1240.3	1857	1633	2040.1	****	1846	17
261	18	Sob	458	11.03082	5.48	11.4305	1.50	1.00482	20.1157	-18.01	63.113	3.2	79	624	1239.9	1855	1656	2126.0	054	1842	18
262	19	Nie	459	11.07048	6.10	11.4640	1.27	1.00454	20.5856	-14.10	63.444	4.2	86	626	1239.6	1852	1715	2209.5	205	1838	19
263	20	Pon	460	11.11014	6.31	11.5015	1.03	1.00426	21.4358	-9.47	63.629	5.2	92	628	1239.2	1850	1730	2251.1	315	1834	20
264	21	Wto	461	11.14579	6.52	11.5351	0.40	1.00398	22.2744	-5.04	63.680	6.2	97	629	1238.9	1847	1744	2331.7	424	1830	21
265	22	Śro	462	11.18545	7.14	11.5726	0.17	1.00370	23.1055	-0.09	63.615	7.2	99	631	1238.5	1845	1757	*****	533	1826	22
266	23	Czw	463	11.22510	7.35	12.0101	-0.07	1.00342	23.5418	4.47	63.446	0.0	100	633	1238.2	1843	1810	012.1	642	1822	23
267	24	Pią	464	11.26476	7.56	12.0437	-0.30	1.00314	0.3836	9.34	63.184	1.0	99	634	1237.8	1840	1825	053.0	752	1818	24
268	25	Sob	465	11.30441	8.17	12.0812	-0.53	1.00286	1.2432	14.02	62.834	2.0	96	636	1237.5	1838	1842	135.4	902	1814	25
269	26	Nie	466	11.34406	8.38	12.1148	-1.17	1.00258	2.1243	17.58	62.398	3.0	92	638	1237.1	1835	1903	220.0	1015	1810	26
270	27	Pon	467	11.38372	8.58	12.1524	-1.40	1.00230	3.0333	21.10	61.877	4.0	85	640	1236.8	1833	1931	307.3	1127	1806	27
271	28	Wto	468	11.42338	9.18	12.1901	-2.03	1.00203	3.5709	23.25	61.272	5.0	77	641	1236.4	1830	2008	357.7	1236	1803	28
272	29	Śro	469	11.46303	9.38	12.2237	-2.27	1.00175	4.5310	24.29	60.589	6.0	68	643	1236.1	1828	2058	451.0	1339	1759	29
273	30	Czw	470	11.50269	9.58	12.2614	-2.50	1.00147	5.5051	24.14	59.841	7.0	58	645	1235.8	1826	2201	546.4	1431	1755	30

Fazy Księżyca [Dm, h.mm]: 3kw 1, 19.22 Now 8, 12.30 1kw 15, 7.50 Pełn 23, 11.17

WRZESIEŃ 2010 (c.d.)

Świty, zmierny astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	3.43	21.47	6.37	19.12	10.32	20.25	10.03	20.41	20.11	8.09	8.18	20.27	20.03	8.03	19.08	4.56	15.57	0.38		
	10.698	8.24	10.841	2.78	13.412	-12.23	13.301	-8.17	0.099	-1.06	12.313	0.34	23.984	-0.96	21.958	-12.97	18.204	-18.41	22.67029	1
3	3.49	21.40	6.17	19.04	10.35	20.18	10.03	20.35	20.03	7.60	8.12	20.20	19.55	7.54	19.00	4.47	15.49	0.30		
	10.819	7.51	10.732	3.82	13.513	-13.08	13.382	-8.68	0.085	-1.16	12.327	0.24	23.979	-0.99	21.955	-12.99	18.204	-18.42	22.80171	3
5	3.54	21.34	5.57	18.56	10.38	20.11	10.03	20.29	19.54	7.51	8.05	20.12	19.47	7.46	18.52	4.39	15.41	0.22		
	10.940	6.78	10.630	4.94	13.611	-13.90	13.463	-9.18	0.071	-1.26	12.341	0.15	23.975	-1.02	21.952	-13.01	18.203	-18.43	22.93313	5
7	3.59	21.28	5.38	18.49	10.41	20.04	10.02	20.23	19.46	7.41	7.59	20.05	19.40	7.38	18.44	4.31	15.33	0.14		
	11.060	6.03	10.543	6.06	13.706	-14.70	13.545	-9.69	0.056	-1.36	12.355	0.05	23.970	-1.05	21.948	-13.03	18.202	-18.44	23.06455	7
9	4.04	21.22	5.21	18.43	10.43	19.57	10.02	20.18	19.38	7.32	7.52	19.57	19.32	7.30	18.36	4.23	15.25	0.06		
	11.180	5.28	10.480	7.10	13.799	-15.48	13.628	-10.19	0.040	-1.46	12.370	-0.04	23.965	-1.08	21.945	-13.05	18.202	-18.45	23.19597	9
11	4.08	21.16	5.06	18.38	10.45	19.50	10.02	20.12	19.30	7.23	7.46	19.50	19.24	7.21	18.28	4.15	15.18	23.54		
	11.300	4.52	10.450	7.97	13.888	-16.23	13.711	-10.69	0.025	-1.57	12.385	-0.14	23.961	-1.11	21.942	-13.06	18.202	-18.46	23.32738	11
13	4.13	21.10	4.55	18.34	10.47	19.43	10.02	20.06	19.22	7.13	7.39	19.42	19.16	7.13	18.20	4.07	15.10	23.46		
	11.419	3.76	10.455	8.63	13.974	-16.96	13.795	-11.18	0.009	-1.67	12.399	-0.23	23.956	-1.14	21.939	-13.08	18.202	-18.46	23.45880	13
15	4.18	21.04	4.48	18.31	10.49	19.35	10.02	20.01	19.13	7.04	7.33	19.35	19.08	7.05	18.12	3.59	15.02	23.38		
	11.539	2.99	10.499	9.03	14.056	-17.65	13.879	-11.67	23.993	-1.78	12.414	-0.33	23.951	-1.18	21.936	-13.10	18.202	-18.47	23.59022	15
17	4.22	20.58	4.44	18.28	10.50	19.28	10.02	19.55	19.05	6.54	7.26	19.27	18.60	6.56	18.04	3.50	14.54	23.30		
	11.658	2.22	10.579	9.15	14.134	-18.31	13.964	-12.16	23.977	-1.89	12.429	-0.43	23.946	-1.21	21.932	-13.11	18.202	-18.48	23.72164	17
19	4.26	20.52	4.44	18.26	10.50	19.20	10.02	19.50	18.57	6.45	7.20	19.20	18.52	6.48	17.57	3.42	14.46	23.22		
	11.778	1.44	10.693	8.99	14.207	-18.94	14.050	-12.64	23.961	-2.00	12.444	-0.52	23.941	-1.24	21.930	-13.13	18.202	-18.49	23.85306	19
21	4.31	20.47	4.47	18.25	10.50	19.13	10.02	19.44	18.49	6.36	7.13	19.12	18.44	6.40	17.49	3.34	14.39	23.14		
	11.897	0.67	10.836	8.55	14.274	-19.53	14.136	-13.12	23.944	-2.10	12.459	-0.62	23.936	-1.27	21.927	-13.14	18.203	-18.50	23.98448	21
23	4.35	20.41	4.53	18.23	10.50	19.05	10.02	19.39	18.40	6.26	7.07	19.05	18.36	6.31	17.41	3.26	14.31	23.07		
	12.017	-0.11	11.004	7.87	14.336	-20.08	14.223	-13.60	23.928	-2.21	12.474	-0.72	23.931	-1.30	21.924	-13.16	18.203	-18.51	0.11590	23
25	4.39	20.36	5.01	18.21	10.49	18.57	10.03	19.33	18.32	6.17	7.00	18.57	18.28	6.23	17.33	3.18	14.23	22.59		
	12.137	-0.89	11.190	6.96	14.392	-20.59	14.310	-14.06	23.912	-2.32	12.489	-0.81	23.926	-1.34	21.921	-13.17	18.204	-18.52	0.24731	25
27	4.43	20.30	5.11	18.20	10.47	18.49	10.03	19.28	18.24	6.07	6.54	18.50	18.20	6.15	17.25	3.10	14.15	22.51		
	12.257	-1.67	11.390	5.87	14.441	-21.06	14.398	-14.53	23.896	-2.42	12.504	-0.91	23.922	-1.37	21.918	-13.19	18.205	-18.52	0.37873	27
29	4.47	20.25	5.22	18.17	10.45	18.40	10.03	19.23	18.15	5.58	6.48	18.42	18.12	6.06	17.17	3.02	14.08	22.43		
	12.377	-2.45	11.598	4.63	14.482	-21.47	14.487	-14.98	23.880	-2.52	12.519	-1.01	23.917	-1.40	21.916	-13.20	18.206	-18.53	0.51015	29

PAŹDZIERNIK 2010

Piwnice, CA UMK			← Dane na godz. 12 czasu strefowego (= 10 lub 11 ^b UT) →									 Czas strefowy [hhmm.]								
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ		Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
			2455																		
274	1	Pią	471	11.54234	10.18	12.2951	-3.13	1.00119	6.4907	22.36	59.057	0.3	47	647	1235.5	1823	2316	642.8	1513	1751	1
275	2	Sob	472	11.58200	10.37	12.3328	-3.37	1.00091	7.4701	19.35	58.276	1.3	36	648	1235.1	1821	****	739.0	1545	1747	2
276	3	Nie	473	12.02166	10.56	12.3706	-3.60	1.00063	8.4355	15.21	57.553	2.3	26	650	1234.8	1818	039	834.2	1610	1743	3
277	4	Pon	474	12.06131	11.14	12.4044	-4.23	1.00035	9.3941	10.07	56.951	3.3	16	652	1234.5	1816	206	928.1	1631	1739	4
278	5	Wto	475	12.10096	11.33	12.4422	-4.46	1.00006	10.3438	4.13	56.536	4.3	8	654	1234.2	1814	334	1021.0	1649	1735	5
279	6	Śro	476	12.14062	11.50	12.4801	-5.09	0.99978	11.2925	-2.00	56.361	5.3	3	655	1233.9	1811	503	1113.7	1707	1731	6
280	7	Czw	477	12.18027	12.08	12.5140	-5.32	0.99950	12.2445	-8.07	56.458	6.3	0	657	1233.6	1809	633	1207.0	1726	1727	7
281	8	Pią	478	12.21593	12.25	12.5520	-5.55	0.99921	13.2115	-13.43	56.831	0.6	1	659	1233.3	1807	803	1301.6	1748	1723	8
282	9	Sob	479	12.25558	12.41	12.5860	-6.18	0.99892	14.1912	-18.23	57.450	1.6	4	701	1233.1	1804	931	1357.8	1814	1719	9
283	10	Nie	480	12.29524	12.57	13.0240	-6.41	0.99863	15.1821	-21.50	58.259	2.6	10	703	1232.8	1802	1055	1455.3	1849	1715	10
284	11	Pon	481	12.33489	13.13	13.0621	-7.03	0.99834	16.1753	-23.52	59.184	3.6	17	704	1232.5	1800	1210	1553.1	1933	1711	11
285	12	Wto	482	12.37455	13.28	13.1002	-7.26	0.99805	17.1634	-24.27	60.147	4.6	26	706	1232.3	1757	1312	1649.7	2029	1707	12
286	13	Śro	483	12.41421	13.43	13.1344	-7.48	0.99776	18.1314	-23.40	61.072	5.6	35	708	1232.0	1755	1359	1743.8	2133	1704	13
287	14	Czw	484	12.45386	13.57	13.1727	-8.11	0.99747	19.0705	-21.42	61.898	6.6	45	710	1231.8	1753	1434	1834.6	2243	1700	14
288	15	Pią	485	12.49352	14.11	13.2110	-8.33	0.99718	19.5752	-18.46	62.579	0.5	55	712	1231.6	1751	1500	1922.1	2354	1656	15
289	16	Sob	486	12.53317	14.24	13.2453	-8.55	0.99689	20.4548	-15.05	63.088	1.5	64	713	1231.3	1748	1519	2006.6	****	1652	16
290	17	Nie	487	12.57283	14.36	13.2837	-9.17	0.99660	21.3127	-10.51	63.412	2.5	73	715	1231.1	1746	1536	2048.9	104	1648	17
291	18	Pon	488	13.01248	14.48	13.3222	-9.39	0.99632	22.1531	-6.14	63.556	3.5	81	717	1230.9	1744	1550	2129.8	213	1644	18
292	19	Wto	489	13.05214	14.60	13.3607	-10.01	0.99603	22.5849	-1.24	63.532	4.5	88	719	1230.8	1742	1604	2210.1	322	1640	19
293	20	Śro	490	13.09179	15.11	13.3953	-10.22	0.99575	23.4210	3.30	63.365	5.5	93	721	1230.6	1739	1617	2251.0	430	1636	20
294	21	Czw	491	13.13145	15.21	13.4339	-10.44	0.99547	0.2623	8.19	63.082	6.5	97	723	1230.4	1737	1632	2333.1	540	1632	21
295	22	Pią	492	13.17110	15.30	13.4726	-11.05	0.99519	1.1211	12.52	62.709	7.5	100	725	1230.2	1735	1648	*****	650	1628	22
296	23	Sob	493	13.21076	15.39	13.5114	-11.26	0.99491	2.0015	16.57	62.273	0.3	100	726	1230.1	1733	1709	017.3	803	1624	23
297	24	Nie	494	13.25041	15.47	13.5502	-11.47	0.99464	2.5100	20.21	61.792	1.3	98	728	1230.0	1731	1735	104.3	916	1620	24
298	25	Pon	495	13.29007	15.54	13.5851	-12.08	0.99437	3.4430	22.49	61.282	2.3	94	730	1229.8	1729	1810	154.4	1027	1616	25
299	26	Wto	496	13.32573	16.01	14.0241	-12.28	0.99410	4.4022	24.09	60.750	3.3	89	732	1229.7	1727	1856	247.3	1132	1612	26
300	27	Śro	497	13.36538	16.07	14.0632	-12.49	0.99384	5.3743	24.11	60.202	4.3	81	734	1229.6	1725	1955	342.3	1228	1608	27
301	28	Czw	498	13.40504	16.12	14.1023	-13.09	0.99358	6.3527	22.51	59.643	5.3	72	736	1229.5	1723	2106	438.2	1312	1605	28
302	29	Pią	499	13.44469	16.17	14.1415	-13.29	0.99332	7.3232	20.12	59.080	6.3	62	738	1229.5	1721	2225	533.7	1346	1601	29
303	30	Sob	500	13.48435	16.20	14.1808	-13.48	0.99306	8.2817	16.22	58.530	7.3	51	739	1229.4	1719	2347	627.8	1413	1557	30
304	31	Nie	501	13.52401	16.23	14.2202	-14.08	0.99281	9.2238	11.34	58.020	0.9	40	741	1229.4	1717	****	720.3	1434	1553	31
304	31	Nie	501	14.52499	16.23	14.2212	-14.09	0.99279	9.2452	11.21	58.000	1.9	40	641	1129.4	1617	****	620.3	1334	1453	31

Fazy Księżyca [Dm, h.mm]: 3kw 1, 5.52 Now 7, 20.44 1kw 14, 23.27 Pełn 23, 3.36 3kw 30, 14.46

PAŹDZIERNIK 2010 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.51	20.20	5.34	18.15	10.41	18.32	10.03	19.17	18.07	5.49	6.41	18.35	18.04	5.58	17.09	2.54	13.60	22.35		
	12.497	-3.22	11.811	3.29	14.515	-21.83	14.576	-15.43	23.864	-2.63	12.534	-1.10	23.912	-1.43	21.914	-13.21	18.207	-18.54	0.64157	1
3	4.55	20.15	5.47	18.13	10.37	18.23	10.03	19.12	17.59	5.39	6.35	18.28	17.56	5.50	17.01	2.46	13.52	22.27		
	12.618	-4.00	12.027	1.86	14.540	-22.13	14.667	-15.88	23.848	-2.73	12.549	-1.20	23.907	-1.46	21.911	-13.23	18.209	-18.55	0.77299	3
5	4.58	20.10	6.00	18.10	10.32	18.15	10.04	19.07	17.51	5.30	6.28	18.20	17.48	5.41	16.53	2.37	13.44	22.19		
	12.740	-4.77	12.244	0.38	14.556	-22.37	14.757	-16.31	23.833	-2.82	12.565	-1.30	23.902	-1.49	21.909	-13.24	18.210	-18.56	0.90441	5
7	5.02	20.05	6.13	18.07	10.26	18.06	10.04	19.02	17.42	5.21	6.22	18.13	17.40	5.33	16.45	2.29	13.37	22.12		
	12.861	-5.54	12.459	-1.12	14.563	-22.55	14.849	-16.74	23.818	-2.92	12.580	-1.39	23.898	-1.52	21.907	-13.25	18.212	-18.56	1.03583	7
9	5.06	19.60	6.26	18.04	10.19	17.57	10.04	18.57	17.34	5.12	6.15	18.05	17.32	5.25	16.37	2.21	13.29	22.04		
	12.983	-6.30	12.674	-2.64	14.560	-22.64	14.941	-17.16	23.803	-3.01	12.595	-1.49	23.893	-1.55	21.905	-13.26	18.214	-18.57	1.16724	9
11	5.10	19.55	6.39	18.00	10.10	17.48	10.04	18.52	17.26	5.02	6.09	17.58	17.24	5.16	16.29	2.13	13.21	21.56		
	13.106	-7.06	12.887	-4.16	14.547	-22.66	15.034	-17.57	23.789	-3.10	12.610	-1.58	23.888	-1.58	21.903	-13.27	18.215	-18.58	1.29866	11
13	5.13	19.51	6.52	17.57	10.00	17.39	10.05	18.47	17.18	4.53	6.02	17.50	17.16	5.08	16.21	2.05	13.14	21.48		
	13.229	-7.81	13.098	-5.67	14.523	-22.60	15.128	-17.98	23.775	-3.18	12.625	-1.68	23.884	-1.61	21.901	-13.28	18.218	-18.59	1.43008	13
15	5.17	19.46	7.05	17.54	9.49	17.31	10.05	18.43	17.09	4.44	5.56	17.43	17.08	4.60	16.13	1.57	13.06	21.40		
	13.353	-8.55	13.307	-7.15	14.490	-22.45	15.222	-18.37	23.762	-3.26	12.640	-1.77	23.879	-1.64	21.900	-13.29	18.220	-18.59	1.56150	15
17	5.20	19.42	7.17	17.50	9.37	17.22	10.06	18.38	17.01	4.35	5.49	17.35	16.60	4.52	16.06	1.49	12.58	21.33		
	13.477	-9.28	13.515	-8.60	14.447	-22.20	15.317	-18.76	23.749	-3.34	12.655	-1.86	23.875	-1.66	21.898	-13.29	18.222	-18.60	1.69292	17
19	5.24	19.37	7.30	17.47	9.24	17.14	10.06	18.33	16.53	4.26	5.43	17.28	16.52	4.43	15.58	1.41	12.51	21.25		
	13.602	-10.01	13.721	-10.02	14.396	-21.86	15.413	-19.14	23.737	-3.41	12.670	-1.95	23.871	-1.69	21.897	-13.30	18.225	-18.61	1.82434	19
21	5.27	19.33	7.42	17.44	9.09	17.05	10.06	18.29	16.45	4.17	5.36	17.20	16.44	4.35	15.50	1.33	12.43	21.17		
	13.727	-10.73	13.927	-11.40	14.337	-21.42	15.510	-19.50	23.725	-3.48	12.684	-2.05	23.867	-1.71	21.895	-13.31	18.227	-18.62	1.95576	21
23	5.31	19.29	7.54	17.40	8.54	16.57	10.07	18.24	16.37	4.08	5.30	17.13	16.36	4.27	15.42	1.25	12.35	21.09		
	13.854	-11.43	14.131	-12.73	14.272	-20.89	15.607	-19.86	23.714	-3.55	12.699	-2.14	23.863	-1.74	21.894	-13.31	18.230	-18.62	2.08717	23
25	5.34	19.25	8.06	17.37	8.37	16.50	10.07	18.20	16.28	3.60	5.23	17.05	16.28	4.19	15.34	1.17	12.28	21.02		
	13.981	-12.13	14.335	-14.02	14.203	-20.28	15.705	-20.20	23.704	-3.61	12.714	-2.23	23.859	-1.76	21.893	-13.32	18.233	-18.63	2.21859	25
27	5.38	19.22	8.18	17.34	8.21	16.42	10.07	18.16	16.20	3.51	5.17	16.58	16.20	4.10	15.26	1.09	12.20	20.54		
	14.109	-12.81	14.540	-15.26	14.131	-19.59	15.804	-20.54	23.694	-3.66	12.728	-2.31	23.855	-1.79	21.892	-13.32	18.236	-18.64	2.35001	27
29	5.41	19.18	8.29	17.31	8.04	16.35	10.08	18.12	16.12	3.42	5.10	16.50	16.12	4.02	15.18	1.02	12.12	20.46		
	14.238	-13.48	14.744	-16.44	14.059	-18.84	15.904	-20.86	23.685	-3.71	12.743	-2.40	23.852	-1.81	21.892	-13.33	18.239	-18.64	2.48144	29
31	5.44	19.14	8.41	17.28	7.46	16.28	10.08	18.08	16.04	3.34	5.04	16.43	16.04	3.54	15.10	0.54	12.05	20.39		
	14.367	-14.13	14.948	-17.57	13.990	-18.04	16.004	-21.17	23.677	-3.76	12.757	-2.49	23.848	-1.83	21.891	-13.33	18.242	-18.65	2.61286	31
31	4.44	18.14	7.41	16.29	6.46	15.28	9.08	17.08	15.04	2.34	4.04	15.43	15.04	2.54	14.10	23.50	11.05	19.39		
	14.370	-14.15	14.952	-17.59	13.988	-18.03	16.006	-21.17	23.677	-3.76	12.757	-2.49	23.848	-1.83	21.891	-13.33	18.242	-18.65	2.61286	31

LISTOPAD 2010

Piwnice, CA UMK				Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]							
..... Dzień				ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.		
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.'	j astr	h.mmss	°.'	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm
2455																					
305	1	Pon	502	14.56465	16.25	14.2607	-14.28	0.99254	10.1809	5.50	57.568	2.9	29	643	1129.3	1615	012	711.6	1353	1449	1
306	2	Wto	503	15.00430	16.26	14.3002	-14.47	0.99229	11.1107	-0.05	57.256	3.9	19	645	1129.3	1613	137	802.3	1410	1445	2
307	3	Śro	504	15.04396	16.27	14.3358	-15.06	0.99204	12.0438	-6.03	57.108	4.9	10	647	1129.3	1611	303	853.6	1428	1441	3
308	4	Czw	505	15.08361	16.26	14.3755	-15.25	0.99179	12.5931	-11.43	57.157	5.9	4	649	1129.3	1609	430	946.2	1448	1437	4
309	5	Pią	506	15.12327	16.25	14.4153	-15.43	0.99154	13.5617	-16.40	57.423	6.9	1	651	1129.3	1607	558	1040.8	1512	1433	5
310	6	Sob	507	15.16292	16.23	14.4552	-16.01	0.99130	14.5459	-20.34	57.900	0.3	0	653	1129.4	1605	725	1137.8	1543	1429	6
311	7	Nie	508	15.20258	16.20	14.4951	-16.19	0.99105	15.5460	-23.08	58.560	1.3	2	655	1129.4	1604	845	1236.0	1622	1425	7
312	8	Pon	509	15.24223	16.16	14.5352	-16.36	0.99081	16.5504	-24.14	59.352	2.3	6	656	1129.5	1602	954	1334.4	1714	1421	8
313	9	Wto	510	15.28189	16.11	14.5753	-16.54	0.99056	17.5344	-23.53	60.211	3.3	13	658	1129.6	1600	1049	1431.1	1816	1417	9
314	10	Śro	511	15.32155	16.06	15.0155	-17.11	0.99032	18.4944	-22.14	61.069	4.3	20	700	1129.7	1558	1130	1524.7	1926	1413	10
315	11	Czw	512	15.36120	15.59	15.0558	-17.27	0.99008	19.4229	-19.31	61.859	5.3	29	702	1129.8	1557	1200	1614.6	2038	1410	11
316	12	Pią	513	15.40086	15.52	15.1002	-17.44	0.98984	20.3158	-15.59	62.525	6.3	38	704	1129.9	1555	1223	1701.0	2149	1406	12
317	13	Sob	514	15.44051	15.44	15.1406	-17.60	0.98961	21.1840	-11.51	63.026	7.3	48	706	1130.0	1554	1241	1744.5	2300	1402	13
318	14	Nie	515	15.48017	15.35	15.1812	-18.15	0.98938	22.0319	-7.19	63.334	0.8	57	708	1130.2	1552	1256	1826.0	****	1358	14
319	15	Pon	516	15.51582	15.26	15.2218	-18.31	0.98915	22.4648	-2.33	63.440	1.8	66	709	1130.3	1551	1310	1906.5	008	1354	15
320	16	Wto	517	15.55548	15.15	15.2625	-18.46	0.98892	23.3000	2.18	63.351	2.8	75	711	1130.5	1549	1323	1947.0	117	1350	16
321	17	Śro	518	15.59513	15.04	15.3033	-19.01	0.98870	0.1350	7.07	63.088	3.8	83	713	1130.7	1548	1337	2028.4	225	1346	17
322	18	Czw	519	16.03479	14.52	15.3441	-19.15	0.98849	0.5910	11.44	62.680	4.8	89	715	1130.9	1546	1353	2111.8	335	1342	18
323	19	Pią	520	16.07444	14.39	15.3851	-19.29	0.98827	1.4645	15.56	62.169	5.8	95	717	1131.1	1545	1412	2158.0	447	1338	19
324	20	Sob	521	16.11410	14.25	15.4301	-19.43	0.98807	2.3712	19.32	61.595	6.8	98	718	1131.3	1544	1437	2247.5	600	1334	20
325	21	Nie	522	16.15376	14.10	15.4712	-19.56	0.98787	3.3042	22.16	61.001	7.8	100	720	1131.6	1542	1509	2340.3	713	1330	21
326	22	Pon	523	16.19341	13.55	15.5124	-20.09	0.98767	4.2659	23.53	60.422	0.7	99	722	1131.8	1541	1552	*****	821	1326	22
327	23	Wto	524	16.23307	13.39	15.5537	-20.22	0.98748	5.2507	24.11	59.885	1.7	97	724	1132.1	1540	1648	035.8	922	1322	23
328	24	Śro	525	16.27273	13.22	15.5951	-20.34	0.98729	6.2350	23.06	59.408	2.7	92	725	1132.4	1539	1756	132.6	1010	1318	24
329	25	Czw	526	16.31238	13.04	16.0405	-20.46	0.98711	7.2147	20.38	58.998	3.7	85	727	1132.7	1538	1914	229.2	1048	1314	25
330	26	Pią	527	16.35204	12.46	16.0820	-20.58	0.98693	8.1806	16.58	58.653	4.7	76	729	1133.0	1537	2036	324.3	1117	1311	26
331	27	Sob	528	16.39169	12.26	16.1236	-21.09	0.98675	9.1228	12.21	58.373	5.7	66	730	1133.3	1536	2159	417.2	1140	1307	27
332	28	Nie	529	16.43135	12.06	16.1652	-21.19	0.98659	10.0514	7.02	58.154	6.7	55	732	1133.6	1535	2323	508.2	1159	1303	28
333	29	Pon	530	16.47100	11.46	16.2110	-21.30	0.98642	10.5704	1.19	58.002	0.6	43	733	1134.0	1534	***	558.0	1216	1259	29
334	30	Wto	531	16.51066	11.24	16.2528	-21.40	0.98626	11.4854	-4.29	57.927	1.6	32	735	1134.3	1533	046	647.4	1233	1255	30

Fazy Księżyca [Dm, h.mm]: Nów 6, 5.52 1kw 13, 17.39 Pełn 21, 18.27 3kw 28, 21.36

LISTOPAD 2010 (c.d.)

Świty, zmierzchy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERKURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0^h UT)	
1	4.46	18.13	7.47	16.27	6.38	15.25	9.08	17.06	15.00	2.29	4.01	15.39	15.00	2.50	14.06	23.46	11.01	19.35		
	14.435	-14.47	15.055	-18.13	13.955	-17.62	16.056	-21.32	23.673	-3.78	12.764	-2.53	23.847	-1.84	21.891	-13.33	18.244	-18.65	2.67857	1
3	4.49	18.09	7.58	16.25	6.21	15.18	9.08	17.02	14.52	2.21	3.54	15.32	14.52	2.42	13.58	23.38	10.53	19.27		
	14.566	-15.10	15.260	-19.17	13.891	-16.79	16.158	-21.61	23.666	-3.81	12.778	-2.62	23.843	-1.86	21.891	-13.33	18.247	-18.66	2.80998	3
5	4.53	18.06	8.09	16.23	6.04	15.12	9.09	16.58	14.44	2.12	3.47	15.24	14.44	2.34	13.51	23.30	10.46	19.19		
	14.698	-15.72	15.466	-20.14	13.834	-15.97	16.260	-21.89	23.660	-3.84	12.792	-2.70	23.840	-1.88	21.890	-13.33	18.251	-18.66	2.94140	5
7	4.56	18.03	8.20	16.21	5.49	15.06	9.09	16.54	14.36	2.04	3.41	15.17	14.36	2.26	13.43	23.22	10.38	19.12		
	14.831	-16.31	15.672	-21.05	13.785	-15.17	16.362	-22.16	23.655	-3.87	12.806	-2.78	23.837	-1.90	21.890	-13.33	18.254	-18.67	3.07282	7
9	4.59	18.00	8.30	16.20	5.34	15.01	9.09	16.51	14.28	1.56	3.34	15.09	14.28	2.17	13.35	23.14	10.30	19.04		
	14.965	-16.89	15.880	-21.89	13.745	-14.40	16.466	-22.41	23.650	-3.89	12.820	-2.86	23.835	-1.91	21.890	-13.33	18.258	-18.68	3.20424	9
11	5.02	17.58	8.40	16.19	5.20	14.55	9.09	16.48	14.20	1.48	3.28	15.02	14.20	2.09	13.27	23.06	10.23	18.56		
	15.099	-17.45	16.087	-22.66	13.714	-13.68	16.570	-22.64	23.647	-3.91	12.833	-2.94	23.832	-1.93	21.891	-13.33	18.262	-18.68	3.33566	11
13	5.05	17.55	8.50	16.18	5.07	14.50	9.09	16.44	14.12	1.40	3.21	14.54	14.12	2.01	13.19	22.59	10.15	18.49		
	15.235	-18.00	16.295	-23.35	13.693	-13.02	16.674	-22.87	23.644	-3.92	12.846	-3.02	23.830	-1.94	21.891	-13.33	18.266	-18.69	3.46709	13
15	5.08	17.53	8.59	16.18	4.55	14.45	9.09	16.41	14.04	1.32	3.14	14.47	14.04	1.53	13.11	22.51	10.08	18.41		
	15.372	-18.51	16.503	-23.97	13.682	-12.43	16.780	-23.07	23.642	-3.92	12.859	-3.10	23.828	-1.96	21.892	-13.32	18.270	-18.69	3.59850	15
17	5.11	17.50	9.08	16.18	4.44	14.40	9.09	16.38	13.56	1.24	3.08	14.39	13.57	1.45	13.03	22.43	10.00	18.33		
	15.509	-19.01	16.710	-24.50	13.681	-11.92	16.885	-23.27	23.641	-3.92	12.872	-3.17	23.826	-1.97	21.892	-13.32	18.274	-18.70	3.72992	17
19	5.14	17.48	9.16	16.19	4.34	14.35	9.09	16.35	13.48	1.16	3.01	14.32	13.49	1.37	12.56	22.35	9.53	18.26		
	15.647	-19.49	16.915	-24.95	13.690	-11.48	16.992	-23.44	23.640	-3.91	12.885	-3.25	23.824	-1.98	21.893	-13.32	18.278	-18.70	3.86134	19
21	5.17	17.47	9.23	16.20	4.25	14.30	9.09	16.33	13.40	1.08	2.54	14.24	13.41	1.29	12.48	22.27	9.45	18.18		
	15.787	-19.94	17.118	-25.31	13.708	-11.12	17.099	-23.60	23.641	-3.90	12.897	-3.32	23.822	-1.99	21.894	-13.31	18.283	-18.70	3.99276	21
23	5.20	17.45	9.30	16.22	4.18	14.26	9.08	16.30	13.32	1.00	2.47	14.17	13.33	1.21	12.40	22.20	9.37	18.10		
	15.927	-20.37	17.318	-25.58	13.736	-10.84	17.206	-23.75	23.642	-3.88	12.909	-3.39	23.821	-2.00	21.895	-13.30	18.287	-18.71	4.12418	23
25	5.23	17.43	9.35	16.25	4.11	14.21	9.08	16.28	13.24	0.53	2.41	14.09	13.25	1.13	12.32	22.12	9.30	18.03		
	16.068	-20.77	17.512	-25.76	13.773	-10.63	17.314	-23.88	23.644	-3.85	12.921	-3.46	23.820	-2.00	21.896	-13.30	18.291	-18.71	4.25561	25
27	5.25	17.42	9.39	16.27	4.05	14.17	9.07	16.26	13.16	0.45	2.34	14.02	13.17	1.05	12.24	22.04	9.22	17.55		
	16.210	-21.15	17.698	-25.85	13.818	-10.50	17.423	-23.99	23.647	-3.83	12.933	-3.52	23.819	-2.01	21.898	-13.29	18.296	-18.72	4.38703	27
29	5.28	17.41	9.41	16.30	3.60	14.12	9.07	16.23	13.09	0.38	2.27	13.54	13.09	0.57	12.16	21.56	9.15	17.48		
	16.353	-21.50	17.874	-25.84	13.871	-10.44	17.532	-24.09	23.651	-3.79	12.944	-3.59	23.818	-2.01	21.899	-13.28	18.300	-18.72	4.51845	29

GRUDZIEŃ 2010

Piwnice, CA UMK			Dane na godz. 12 czasu strefowego (= 11 ^h UT)										Czas strefowy [hhmm.]									
..... Dzień			ST	$\Delta\alpha$	α_{\odot}	δ_{\odot}	R_{\odot}	α_{ζ}	δ_{ζ}	R_{ζ}	Faza ζ	Słońce			Księżyc			Gal.				
Dr	Dm	Dt	JD	h.mmss	m.ss	h.mmss	°.	j astr	h.mmss	°.	ρ_{\oplus}	dni	%	Wsch	Gór	Zach	Wsch	Gór	Zach	Gór	Dm	
			2455																			
335	1	Śro	532	16.55031	11.02	16.2946	-21.49	0.98610	12.4140	-10.04	57.945	2.6	22	736	1134.7	1533	210	737.7	1252	1251	1	
336	2	Czw	533	16.58597	10.39	16.3406	-21.58	0.98595	13.3609	-15.07	58.076	3.6	13	738	1135.1	1532	335	829.7	1313	1247	2	
337	3	Pią	534	17.02563	10.16	16.3825	-22.07	0.98580	14.3246	-19.17	58.336	4.6	6	739	1135.5	1531	459	924.1	1340	1243	3	
338	4	Sob	535	17.06528	9.52	16.4246	-22.15	0.98565	15.3119	-22.18	58.731	5.6	2	741	1135.9	1531	621	1020.7	1414	1239	4	
339	5	Nie	536	17.10494	9.27	16.4707	-22.23	0.98551	16.3057	-23.57	59.256	6.6	0	742	1136.3	1530	735	1118.6	1500	1235	5	
340	6	Pon	537	17.14459	9.02	16.5129	-22.30	0.98537	17.3016	-24.08	59.887	0.7	1	743	1136.7	1530	836	1216.2	1558	1231	6	
341	7	Wto	538	17.18425	8.36	16.5551	-22.37	0.98523	18.2747	-22.57	60.587	1.7	3	745	1137.1	1529	923	1311.7	1705	1227	7	
342	8	Śro	539	17.22391	8.10	17.0014	-22.44	0.98510	19.2226	-20.34	61.305	2.7	8	746	1137.6	1529	958	1404.1	1817	1223	8	
343	9	Czw	540	17.26356	7.44	17.0437	-22.50	0.98496	20.1349	-17.15	61.988	3.7	14	747	1138.0	1529	1024	1452.7	1930	1219	9	
344	10	Pią	541	17.30322	7.17	17.0901	-22.55	0.98484	21.0204	-13.16	62.582	4.7	22	748	1138.5	1529	1045	1538.1	2042	1215	10	
345	11	Sob	542	17.34287	6.49	17.1325	-23.00	0.98471	21.4749	-8.48	63.039	5.7	30	749	1138.9	1528	1101	1620.7	2152	1212	11	
346	12	Nie	543	17.38253	6.21	17.1749	-23.05	0.98459	22.3150	-4.05	63.321	6.7	39	750	1139.4	1528	1116	1701.7	2301	1208	12	
347	13	Pon	544	17.42218	5.53	17.2214	-23.09	0.98448	23.1503	0.46	63.404	7.7	49	751	1139.9	1528	1129	1742.0	****	1204	13	
348	14	Wto	545	17.46184	5.25	17.2639	-23.13	0.98437	23.5824	5.35	63.279	0.9	58	752	1140.3	1528	1143	1822.7	009	1200	14	
349	15	Śro	546	17.50150	4.56	17.3104	-23.16	0.98426	0.4247	10.14	62.955	1.9	67	753	1140.8	1528	1158	1904.8	118	1156	15	
350	16	Czw	547	17.54115	4.27	17.3530	-23.19	0.98416	1.2907	14.33	62.456	2.9	76	754	1141.3	1528	1215	1949.3	228	1152	16	
351	17	Pią	548	17.58081	3.58	17.3955	-23.21	0.98406	2.1810	18.21	61.819	3.9	84	755	1141.8	1529	1237	2037.0	340	1148	17	
352	18	Sob	549	18.02046	3.29	17.4421	-23.23	0.98397	3.1027	21.24	61.095	4.9	91	756	1142.3	1529	1305	2128.4	453	1144	18	
353	19	Nie	550	18.06012	2.59	17.4847	-23.25	0.98389	4.0601	23.27	60.340	5.9	96	756	1142.8	1529	1343	2223.3	604	1140	19	
354	20	Pon	551	18.09578	2.30	17.5313	-23.26	0.98381	5.0417	24.14	59.612	6.9	99	757	1143.3	1530	1434	2320.7	709	1136	20	
355	21	Wto	552	18.13543	1.60	17.5740	-23.26	0.98374	6.0402	23.36	58.965	0.1	100	757	1143.7	1530	1539	*****	804	1132	21	
356	22	Śro	553	18.17509	1.30	18.0206	-23.26	0.98368	7.0346	21.31	58.441	1.1	98	758	1144.2	1531	1656	018.9	847	1128	22	
357	23	Czw	554	18.21474	1.00	18.0632	-23.26	0.98362	8.0208	18.05	58.065	2.1	94	758	1144.7	1531	1819	116.3	919	1124	23	
358	24	Pią	555	18.25440	0.31	18.1059	-23.25	0.98357	8.5826	13.35	57.845	3.1	88	759	1145.2	1532	1945	211.6	945	1120	24	
359	25	Sob	556	18.29406	0.01	18.1525	-23.23	0.98352	9.5238	8.18	57.770	4.1	79	759	1145.7	1532	2110	304.5	1005	1116	25	
360	26	Nie	557	18.33371	-0.29	18.1951	-23.22	0.98348	10.4517	2.34	57.823	5.1	69	759	1146.2	1533	2234	355.5	1023	1113	26	
361	27	Pon	558	18.37337	-0.58	18.2417	-23.19	0.98345	11.3712	-3.15	57.977	6.1	58	800	1146.7	1534	2357	445.2	1040	1109	27	
362	28	Wto	559	18.41302	-1.28	18.2843	-23.16	0.98342	12.2920	-8.52	58.209	0.3	47	800	1147.2	1535	****	534.9	1058	1105	28	
363	29	Śro	560	18.45268	-1.57	18.3309	-23.13	0.98339	13.2231	-13.59	58.503	1.3	36	800	1147.7	1536	121	625.6	1118	1101	29	
364	30	Czw	561	18.49233	-2.26	18.3734	-23.09	0.98338	14.1721	-18.18	58.848	2.3	25	800	1148.2	1537	244	717.9	1142	1057	30	
365	31	Pią	562	18.53199	-2.55	18.4160	-23.05	0.98336	15.1401	-21.35	59.242	3.3	16	800	1148.7	1538	405	812.3	1213	1053	31	

Fazy Księżyca [Dm, h.mm]: Nów 5, 18.36 1kw 13, 14.59 Pełn 21, 9.13 3kw 28, 5.18

GRUDZIEŃ 2010 (c.d.)

Świty, zmiernicy astronomiczne ($h_{\odot} = -18^{\circ}$; kolumna SŁOŃCE), wschody i zachody planet (w czasie strefowym [hh.mm]) oraz, w drugim wierszu dla danej daty, współrzędne (rektascensja [godziny] i deklinacja [stopnie]) Słońca i planet w południe strefowe dla miejsca Piwnice, CA UMK oraz czas gwiazdowy o północy UT w Greenwich [godziny]

Dm	SŁOŃCE		MERCURY		WENUS		MARS		JOWISZ		SATURN		URAN		NEPTUN		PLUTON		ST	Dm
	Świt	Zm'ch	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	Wsch	Zach	(0 ^h UT)	
1	5.30	17.40	9.42	16.32	3.55	14.08	9.06	16.22	13.01	0.30	2.20	13.47	13.01	0.49	12.09	21.49	9.07	17.40		
	16.496	-21.82	18.035	-25.74	13.930	-10.44	17.641	-24.16	23.656	-3.75	12.955	-3.65	23.817	-2.01	21.901	-13.27	18.305	-18.72	4.64986	1
3	5.32	17.39	9.41	16.35	3.52	14.04	9.05	16.20	12.53	0.23	2.13	13.39	12.53	0.41	12.01	21.41	8.60	17.32		
	16.640	-22.11	18.177	-25.54	13.997	-10.50	17.751	-24.23	23.661	-3.71	12.966	-3.71	23.817	-2.01	21.903	-13.26	18.310	-18.73	4.78128	3
5	5.35	17.39	9.38	16.36	3.49	13.60	9.04	16.18	12.45	0.16	2.06	13.32	12.45	0.34	11.53	21.33	8.52	17.25		
	16.785	-22.38	18.295	-25.26	14.070	-10.61	17.861	-24.27	23.668	-3.66	12.977	-3.77	23.816	-2.01	21.905	-13.25	18.315	-18.73	4.91270	5
7	5.37	17.38	9.33	16.36	3.47	13.56	9.03	16.17	12.38	0.09	1.59	13.24	12.38	0.26	11.45	21.26	8.44	17.17		
	16.931	-22.62	18.381	-24.90	14.149	-10.78	17.971	-24.30	23.675	-3.60	12.987	-3.82	23.816	-2.01	21.907	-13.24	18.319	-18.73	5.04413	7
9	5.39	17.38	9.24	16.35	3.45	13.52	9.02	16.15	12.30	0.02	1.52	13.17	12.30	0.18	11.37	21.18	8.37	17.10		
	17.077	-22.83	18.427	-24.47	14.233	-10.99	18.082	-24.30	23.683	-3.54	12.997	-3.88	23.817	-2.01	21.909	-13.23	18.324	-18.73	5.17555	9
11	5.41	17.38	9.12	16.31	3.44	13.48	9.01	16.14	12.22	23.51	1.45	13.09	12.22	0.10	11.30	21.10	8.29	17.02		
	17.224	-23.01	18.427	-23.97	14.323	-11.24	18.193	-24.30	23.692	-3.47	13.007	-3.93	23.817	-2.01	21.912	-13.22	18.329	-18.74	5.30697	11
13	5.43	17.38	8.57	16.24	3.44	13.44	8.59	16.13	12.15	23.44	1.38	13.01	12.14	0.02	11.22	21.03	8.22	16.54		
	17.370	-23.15	18.372	-23.42	14.417	-11.53	18.304	-24.27	23.701	-3.40	13.016	-3.98	23.818	-2.00	21.914	-13.20	18.334	-18.74	5.43839	13
15	5.44	17.38	8.38	16.14	3.43	13.40	8.58	16.12	12.07	23.37	1.31	12.54	12.06	23.51	11.14	20.55	8.14	16.47		
	17.518	-23.27	18.263	-22.82	14.515	-11.86	18.415	-24.22	23.711	-3.33	13.025	-4.03	23.819	-1.99	21.917	-13.19	18.339	-18.74	5.56981	15
17	5.46	17.39	8.16	16.01	3.44	13.36	8.56	16.12	11.59	23.30	1.24	12.46	11.58	23.43	11.06	20.48	8.07	16.39		
	17.665	-23.36	18.106	-22.19	14.618	-12.21	18.527	-24.16	23.722	-3.25	13.034	-4.07	23.820	-1.98	21.920	-13.17	18.344	-18.74	5.70123	17
19	5.47	17.40	7.53	15.47	3.44	13.33	8.54	16.11	11.52	23.24	1.17	12.39	11.51	23.35	10.58	20.40	7.59	16.32		
	17.813	-23.41	17.918	-21.57	14.724	-12.58	18.638	-24.08	23.734	-3.16	13.042	-4.11	23.821	-1.97	21.923	-13.16	18.349	-18.74	5.83265	19
21	5.48	17.40	7.29	15.31	3.45	13.29	8.52	16.11	11.44	23.17	1.10	12.31	11.43	23.27	10.51	20.32	7.52	16.24		
	17.961	-23.44	17.722	-20.98	14.835	-12.98	18.750	-23.98	23.746	-3.07	13.050	-4.15	23.822	-1.96	21.926	-13.14	18.354	-18.74	5.96408	21
23	5.49	17.42	7.07	15.16	3.47	13.26	8.50	16.10	11.36	23.10	1.03	12.23	11.35	23.20	10.43	20.25	7.44	16.17		
	18.109	-23.43	17.544	-20.50	14.949	-13.39	18.861	-23.86	23.759	-2.98	13.057	-4.19	23.824	-1.95	21.929	-13.13	18.359	-18.75	6.09550	23
25	5.50	17.43	6.48	15.02	3.49	13.22	8.48	16.10	11.29	23.04	0.55	12.16	11.27	23.12	10.35	20.17	7.36	16.09		
	18.257	-23.39	17.404	-20.17	15.066	-13.82	18.973	-23.73	23.773	-2.88	13.064	-4.23	23.826	-1.94	21.932	-13.11	18.364	-18.75	6.22692	25
27	5.50	17.44	6.34	14.50	3.50	13.19	8.46	16.10	11.21	22.57	0.48	12.08	11.19	23.04	10.27	20.10	7.29	16.01		
	18.405	-23.32	17.311	-20.01	15.187	-14.26	19.084	-23.57	23.788	-2.78	13.071	-4.26	23.828	-1.92	21.935	-13.09	18.369	-18.75	6.35834	27
29	5.51	17.46	6.24	14.39	3.53	13.16	8.43	16.10	11.14	22.51	0.41	12.01	11.11	22.57	10.20	20.02	7.21	15.54		
	18.552	-23.22	17.268	-20.01	15.311	-14.70	19.196	-23.40	23.803	-2.67	13.078	-4.29	23.830	-1.91	21.939	-13.07	18.374	-18.75	6.48976	29
31	5.51	17.47	6.17	14.30	3.55	13.13	8.40	16.11	11.06	22.45	0.33	11.53	11.04	22.49	10.12	19.55	7.14	15.46		
	18.700	-23.09	17.270	-20.16	15.437	-15.15	19.307	-23.21	23.819	-2.56	13.084	-4.32	23.833	-1.89	21.942	-13.05	18.380	-18.75	6.62118	31

Święta państwowe i kościelne w Polsce oraz inne ważniejsze dni w roku 2010

Nowy Rok	Pią	1 styczeń	Dzień Matki	Śro	26 maj
Najświętszej Maryi Panny Rodzicielki	Pią	1 styczeń	Trójcy Najświętszej	Nie	30 maj
Objawienia Pańskiego (Trzech Króli)	Śro	6 styczeń	Dzień Dziecka	Wto	1 czerwiec
Juliański Nowy Rok	Czw	14 styczeń	Boże Ciało	Czw	3 czerwiec
Dzień Babci	Czw	21 styczeń	Dzień Dzięczynienia	Nie	6 czerwiec
Dzień Dziadka	Pią	22 styczeń	Najświętszego Serca Pana Jezusa	Pią	11 czerwiec
Ofiarowania Pańskiego	Wto	2 luty	Dzień Ojca	Śro	23 czerwiec
Matki Boskiej Gromnicznej	Wto	2 luty	Noc Świętojańska	Śro	23 czerwiec
Tłusty czwartek	Czw	11 luty	Św. Piotra i Pawła	Wto	29 czerwiec
Walentynki	Nie	14 luty	Wniebowzięcia N.M.P.	Nie	15 sierpień
Środa Popielcowa	Śro	17 luty	Święto Wojska Polskiego	Nie	15 sierpień
Święto UMK	Pią	19 luty	Dzień Solidarności i Wolności	Wto	31 sierpień
Dzień Kobiet	Pon	8 marzec	Dzień Programisty	Pon	13 wrzesień
Narodowy Dzień Życia	Śro	24 marzec	Dożynki – Święto Plonów	Czw	23 wrzesień
Niedziela Palmowa	Nie	28 marzec	Dzień Papieski	Nie	10 październik
Niedziela Wielkanocna	Nie	4 kwiecień	Dzień Edukacji Narodowej	Czw	14 październik
Niedziela Miłosierdzia Bożego	Nie	11 kwiecień	Dzień Papieża Jana Pawła II	Sob	16 październik
Święto Pracy	Sob	1 maj	Wszystkich Świętych	Pon	1 listopad
Dzień Flagi Rzeczypospolitej Polskiej	Nie	2 maj	Zaduszki	Wto	2 listopad
Najświętsza Maryja Królowa Polski	Pon	3 maj	Święto Niepodległości	Czw	11 listopad
Święto Konstytucji 3 Maja	Pon	3 maj	Pierwsza niedziela Adventu	Nie	28 listopad
Wniebowstąpienia Pańskiego	Czw	13 maj	Niepokalane Poczęcie N.M.P.	Śro	8 grudzień
Dzień Polskiej Niezapominajki	Sob	15 maj	Boże Narodzenie	Sob	25 grudzień
Zesłania Ducha Świętego	Nie	23 maj	Sylwester	Pią	31 grudzień

Daty i godziny wstępowania Słońca w poszczególne znaki zodiaku (czas środk.-europ.)

(Dzień miesiąca znajduje się w kolumnie numeru miesiąca, M, przed hh.mm; dla M = 3, 6, 9 i 12 są to jednocześnie początki pór roku)

Rok\M	Wodnik		Ryby		Baran		Byk		Bliźn.		Rak		Lew		Panna		Waga		Skorp.		Strzel.		Kozior.	
	1	hh.mm	2	hh.mm	3	hh.mm	4	hh.mm	5	hh.mm	6	hh.mm	7	hh.mm	8	hh.mm	9	hh.mm	10	hh.mm	11	hh.mm	12	hh.mm
2000	20	19.23	19	9.33	20	8.35	19	19.39	20	18.49	21	2.48	22	13.43	22	20.49	22	18.28	23	3.47	22	1.19	21	14.37
2001	20	1.16	18	15.27	20	14.31	20	1.36	21	0.44	21	8.38	22	19.26	23	2.27	23	0.05	23	9.26	22	7.00	21	20.21
2002	20	7.02	18	21.13	20	20.16	20	7.21	21	6.30	21	14.25	23	1.15	23	8.17	23	5.55	23	15.18	22	12.54	22	2.14
2003	20	12.53	19	3.01	21	2.00	20	13.03	21	12.13	21	20.11	23	7.04	23	14.08	23	11.47	23	21.08	22	18.43	22	8.04
2004	20	18.42	19	8.50	20	7.48	19	18.50	20	17.59	21	1.57	22	12.50	22	19.53	22	17.30	23	2.48	22	0.21	21	13.41
2005	20	0.21	18	14.32	20	13.33	20	0.37	20	23.47	21	7.46	22	18.40	23	1.45	22	23.23	23	8.42	22	6.15	21	19.35
2006	20	6.15	18	20.25	20	19.25	20	6.26	21	5.31	21	13.26	23	0.18	23	7.23	23	5.03	23	14.26	22	12.01	22	1.22
2007	20	12.00	19	2.09	21	1.07	20	12.07	21	11.12	21	19.06	23	5.60	23	13.07	23	10.51	23	20.15	22	17.49	22	7.07
2008	20	17.43	19	7.49	20	6.48	19	17.51	20	17.01	21	0.59	22	11.55	22	19.02	22	16.44	23	2.09	21	23.44	21	13.04
2009	19	23.40	18	13.46	20	12.44	19	23.44	20	22.51	21	6.45	22	17.36	23	0.39	22	22.19	23	7.44	22	5.22	21	18.46
2010	20	5.27	18	19.35	20	18.32	20	5.30	21	4.34	21	12.28	22	23.21	23	6.27	23	4.09	23	13.35	22	11.14	22	0.38
2011	20	11.18	19	1.25	21	0.20	20	11.17	21	10.21	21	18.16	23	5.12	23	12.20	23	10.04	23	19.30	22	17.08	22	6.30
2012	20	17.09	19	7.17	20	6.14	19	17.12	20	16.15	21	0.08	22	11.00	22	18.07	22	15.49	23	1.13	21	22.50	21	12.11
2013	19	22.51	18	13.01	20	12.01	19	23.03	20	22.09	21	6.04	22	16.55	23	0.01	22	21.44	23	7.09	22	4.48	21	18.11
2014	20	4.51	18	18.59	20	17.57	20	4.55	21	3.59	21	11.51	22	22.41	23	5.46	23	3.29	23	12.57	22	10.38	22	0.03
2015	20	10.43	19	0.49	20	23.45	20	10.42	21	9.44	21	17.37	23	4.30	23	11.37	23	9.20	23	18.46	22	16.25	22	5.48
2016	20	16.27	19	6.33	20	5.30	19	16.29	20	15.36	20	23.34	22	10.30	22	17.38	22	15.21	23	0.45	21	22.22	21	11.44
2017	19	22.23	18	12.31	20	11.28	19	22.27	20	21.31	21	5.24	22	16.15	22	23.20	22	21.01	23	6.26	22	4.04	21	17.28
2018	20	4.09	18	18.18	20	17.15	20	4.12	21	3.14	21	11.07	22	21.60	23	5.08	23	2.54	23	12.22	22	10.00	21	23.22
2019	20	9.59	19	0.04	20	22.58	20	9.55	21	8.59	21	16.54	23	3.50	23	11.02	23	8.50	23	18.19	22	15.58	22	5.19
2020	20	15.54	19	5.57	20	4.49	19	15.45	20	14.49	20	22.43	22	9.37	22	16.45	22	14.31	22	23.59	21	21.40	21	11.02
2021	19	21.40	18	11.44	20	10.37	19	21.33	20	20.37	21	4.32	22	15.26	22	22.34	22	20.21	23	5.51	22	3.33	21	16.59
2022	20	3.38	18	17.42	20	16.33	20	3.24	21	2.22	21	10.13	22	21.07	23	4.16	23	2.03	23	11.35	22	9.20	21	22.47
2023	20	9.29	18	23.34	20	22.24	20	9.13	21	8.09	21	15.57	23	2.50	23	10.01	23	7.50	23	17.21	22	15.02	22	4.27
2024	20	15.07	19	5.13	20	4.06	19	14.59	20	13.59	20	21.51	22	8.44	22	15.55	22	13.43	22	23.14	21	20.56	21	10.20
2025	19	20.59	18	11.06	20	10.01	19	20.56	20	19.55	21	3.42	22	14.29	22	21.34	22	19.19	23	4.51	22	2.35	21	16.02

ZAĆMIENIA SŁOŃCA I KSIĘŻYCA w latach 2000 – 2025

widoczne w Piwnicach

($\phi = 53.096^\circ$, $\lambda = 18.564^\circ$, $H = 100$ m n.p.m.)

Oznaczenia:

DATA podana jest w formie: rok (4 cyfry), miesiąc i dzień (po 2 cyfry) oraz dzień tygodnia (pierwsze dwie litery angielskiej nazwy), CET – czas środkowoeuropejski [hh.mm], h i Az – wysokość i azymut (Słońca lub Księżyca) nad horyzontem [stopnie], FAZA, f lub fp – ułamek przesłoniętej średnicy tarczy, FAZA %, F lub Fp – procent przesłoniętej powierzchni tarczy (dla całkowitych zaćmień Księżyca w tym miejscu podano czas pół-trwania całkowitego zaćmienia (tp) [minuty] i oznaczono go literą t), V i P [stopnie] – kąty pozycyjne środków tarcz (lub cienia), Ds, Dm, Du i Dp – średnice [minuty łuku] tarczy Słońca, Księżyca, cienia i półcienia (odpowiednio), Wsch/Zach lub W/Z – najbliższy do zaćmienia moment wschodu lub zachodu Słońca lub Księżyca (definiowany jako chwila, gdy dolny skraj tarczy pokrywa się z horyzontem; CET), Long i Lat – długość i szerokość geograficzna punktu podslonecznego (podksiężycowego) w chwili maksymalnej fazy [stopnie], TT-UT lub dT – przyjęta różnica między czasem efemeryd (TDT, ET) i czasem uniwersalnym [s], durp, dur i durt – w tabeli zaćmień półcieniowych oznaczają czas trwania [minuty] fazy zaćmienia półcieniowego, cieniowego i całkowitego (odpowiednio).

ZAĆMIENIA SŁOŃCA

DATA		POCZĄTEK		MAX.		KONIEC		FAZA		V	Az	Średnice		Wsch.	TT-UT
Rok	M D d	CET	h	CET	h	CET	h	f	%	deg	Ds	Dm	/Zach.		
2003	531Sa	330	0	426	7	527	15	0.853	79p	16	242	31.55	29.66	331.9	1.19
2005	10 3Mo	910	25	1018	31	1129	33	0.434	32p	233	338	31.97	30.41	553.7	1.23
2006	329We	1054	39	1155	40	1256	39	0.490	38p	140	2	32.04	33.55	1811.3	1.25
2008	8 1Fr	948	47	1045	52	1144	55	0.349	24p	43	333	31.52	32.93	407.2	1.28
2011	1 4Tu	813	1	934	9	1101	13	0.821	76p	10	328	32.53	30.69	803.6	1.33
2015	320Fr	945	30	1054	35	1205	37	0.757	70p	347	342	32.12	33.74	552.9	1.41
2021	610Th	1047	58	1149	60	1252	57	0.229	13p	344	2	31.51	29.97	2006.2	1.52
2022	1025Tu	1011	23	1119	25	1228	24	0.503	39p	37	357	32.17	31.98	633.7	1.54
2025	329Sa	1143	40	1226	40	1309	38	0.205	11p	315	12	32.04	33.71	1812.1	1.59

CIENIOWE ZAĆMIENIA KSIĘŻYCA

DATA				POCZĄTEK				MAKSIMUM				KONIEC				FAZA		Dp	Dc	Dk	TT-UT	W/Z	Long	Lat	lp.			
Rok	M	D	d	CET	h	Az	V	P	CET	h	Az	V	P	CET	h	Az	V	P	f	%	[arcmin]	[s]	CET	[deg]				
2000	12	1	Fr	402	31	80	40	79	543	17	100	328	7	725	3	118	260	294	1.33	39t	157.3	90.9	33.1	69	749	291.9	19.8	1
2001	1	9	Tu	1942	34	278	154	114	2120	47	302	216	183	2259	57	334	268	252	1.19	31t	158.5	92.0	33.4	70	1530	56.7	22.4	2
2003	5	16	Fr	303	5	48	106	134	440	-7	67	164	200	617	-21	84	226	266	1.13	26t	157.5	92.8	33.4	72	350	304.2	-18.6	3
2003	11	9	Su	032	50	25	26	41	218	40	58	305	338	404	26	82	235	274	1.02	12t	143.4	77.4	29.5	72	712	336.5	16.3	4
2004	5	4	Tu	1948	4	306	126	95	2130	14	327	43	23	2312	19	351	316	310	1.31	38t	156.3	91.5	33.1	73	1912	51.5	-16.5	5
2004	10	28	Th	214	37	56	50	81	404	23	81	117	155	554	7	103	191	228	1.31	41t	147.2	81.4	30.5	73	647	309.8	13.4	6
2006	9	7	Th	1905	5	290	32	358	1951	12	300	3	332	2037	17	310	334	306	0.19	12	157.7	92.8	33.4	75	1826	77.2	-6.7	7
2007	3	3	Sa	2230	40	331	154	137	2421	43	8	204	208	2611	36	42	256	280	1.24	37t	144.3	78.4	29.7	76	3034	12.9	6.9	8
2008	2	21	Th	243	35	54	63	93	426	21	77	350	27	609	6	97	283	320	1.11	25t	149.7	83.6	31.1	77	652	311.8	10.5	9
2008	8	16	Sa	2035	11	313	126	99	2210	20	334	171	155	2344	23	358	212	211	0.81	85	147.3	82.8	30.7	77	1903	43.3	-12.9	10
2009	12	31	Th	1952	37	279	213	173	2022	41	286	229	190	2053	45	293	244	207	0.08	3	157.7	91.2	33.2	78	1514	70.4	24.0	11
2010	10	12	Tu	732	3	126	81	114	917	-8	146	164	185	1101	-14	169	250	257	1.26	37t	152.1	85.7	31.7	79	759	235.4	23.7	12
2011	6	15	We	1923	-6	303	125	92	2112	6	325	199	177	2302	12	349	269	261	1.70	50t	151.7	87.4	31.9	80	2009	57.0	-23.2	13
2011	11	21	0	1345	-10	210	86	67	1532	0	232	31	1	1718	14	251	332	294	1.11	26t	145.9	79.5	30.1	80	1529	140.3	22.6	14
2013	4	25	Th	2052	12	318	47	22	2107	14	321	37	14	2123	15	325	27	6	0.02	0	155.0	90.1	32.7	82	1901	57.4	-14.4	15
2015	9	28	Mo	207	28	45	28	54	347	16	68	308	342	527	3	88	234	271	1.28	36t	158.0	92.8	33.5	84	547	316.1	1.5	16
2017	8	7	Mo	1822	-8	286	175	138	1920	0	297	202	169	2018	7	308	228	199	0.25	17	145.6	81.2	30.3	87	1922	86.2	-15.4	17
2018	7	27	Fr	1924	-3	300	122	89	2121	10	324	194	172	2319	17	351	261	255	1.61	52t	142.4	78.1	29.4	88	1943	56.3	-19.0	18
2019	12	1	Mo	433	27	87	78	118	612	13	105	149	187	751	0	124	224	256	1.20	31t	158.4	91.9	33.4	89	753	284.8	20.3	19
2019	7	16	Tu	2101	6	321	70	46	2230	12	341	8	356	2360	14	1	305	305	0.66	66	144.4	80.1	30.0	89	2002	39.0	-21.9	20
2022	5	16	Mo	327	2	53	65	96	511	-12	72	342	20	655	-27	91	264	303	1.42	43t	155.9	91.3	33.0	92	343	296.2	-19.3	21
2023	10	28	Sa	2034	37	303	165	133	2114	42	313	182	155	2153	46	325	197	176	0.13	6	154.0	88.2	32.3	93	1612	52.1	14.1	22
2024	9	18	We	312	18	57	318	349	344	14	64	298	331	416	10	71	279	313	0.09	4	157.7	92.7	33.4	95	530	318.1	-2.6	23
2025	9	7	Su	1726	-8	271	83	46	1911	7	291	6	332	2056	20	313	283	257	1.37	41t	153.5	88.7	32.3	96	1821	86.8	-6.0	24

CIENIOWE I PÓLCIENIOWE ZAĆMIENIA KSIĘŻYCA

DATA	CET	h	Az	V	P	fp	Fp/tp	durp	f	F	dur	durt	Dp	Du	Dm	dT	W/Z	Long	Lat	lp.
Rok M D d																				
2000 121Fr	543.5	17	100	328	7	2.332	102t	321.3	1.329	100	203.9	77.7	157.3	90.9	33.1	69	749	291.9	19.8	1
2001 1 9Tu	2120.4	47	302	216	183	2.188	98t	314.1	1.193	100	196.9	61.9	158.5	92.0	33.4	70	1530	56.7	22.4	2
2002 624Mo	2227.0	9	341	16	4	0.236	17	137.2	-0.788	0	0.0	0.0	149.8	85.5	31.4	71	2020	38.8	-24.8	3
20021120We	246.5	39	66	306	341	0.887	93	269.2	-0.223	0	0.0	0.0	144.7	78.6	29.8	71	728	330.1	18.7	4
2003 516Fr	440.0	-7	67	164	200	2.100	96t	309.6	1.132	100	194.5	52.5	157.5	92.8	33.4	72	350	304.2	-18.6	5
200311 8Sa	2618.4	40	58	305	338	2.141	115t	366.9	1.021	100	211.9	23.9	143.4	77.4	29.5	72	3112	336.5	16.3	6
2004 5 4Tu	2130.0	14	327	43	23	2.288	101t	318.8	1.308	100	203.8	76.2	156.3	91.5	33.1	73	1912	51.5	-16.5	7
20041028Th	404.0	23	81	117	155	2.390	115t	357.2	1.312	100	219.2	81.1	147.2	81.4	30.5	73	647	309.8	13.4	8
2006 314Tu	2447.3	38	16	199	209	1.057	30t	292.1	-0.057	0	0.0	0.0	143.4	77.7	29.5	75	3011	5.9	3.1	9
2006 9 7Th	1951.1	12	300	3	332	1.158	42t	258.0	0.189	12	92.4	0.0	157.7	92.8	33.4	75	1826	77.2	-6.7	10
2007 3 3Sa	2420.7	43	8	204	208	2.346	218t	369.0	1.236	100	221.5	73.9	144.3	78.4	29.7	76	3034	12.9	6.9	11
2008 221Th	425.9	21	77	350	27	2.172	107t	342.4	1.110	100	206.0	50.8	149.7	83.6	31.1	77	652	311.8	10.5	12
2008 816Sa	2209.8	20	334	171	155	1.863	98t	334.1	0.812	85	188.8	0.0	147.3	82.8	30.7	77	1903	43.3	-12.9	13
2009 2 9Mo	1538.0	-10	234	54	24	0.926	96	243.0	-0.084	0	0.0	0.0	156.1	89.8	32.8	78	1653	143.6	13.5	14
2009 8 6Th	138.9	17	28	141	158	0.429	39	196.6	-0.662	0	0.0	0.0	142.9	78.4	29.5	78	426	351.3	-15.6	15
20091231Th	2022.5	41	286	229	190	1.081	31t	254.9	0.081	3	61.7	0.0	157.7	91.2	33.2	78	1514	70.4	24.0	16
20101221Tu	916.6	-8	146	164	185	2.307	108t	338.4	1.260	100	209.2	73.1	152.1	85.7	31.7	79	759	235.4	23.7	17
2011 615We	2112.5	6	325	199	177	2.713	111t	339.2	1.704	100	219.8	100.7	151.7	87.4	31.9	80	2009	57.0	-23.2	18
20111210Sa	1531.5	0	232	31	1	2.213	114t	359.9	1.109	100	212.7	52.0	145.9	79.5	30.1	80	1529	140.3	22.6	19
20121128We	1532.8	-1	234	27	356	0.943	97	280.8	-0.184	0	0.0	0.0	143.3	77.1	29.4	81	1540	138.9	20.5	20
2013 425Th	2107.2	14	321	37	14	1.012	13t	251.7	0.019	0	30.8	0.0	155.0	90.1	32.7	82	1901	57.4	-14.4	21
20131018Fr	2450.0	44	28	147	164	0.791	84	243.8	-0.268	0	0.0	0.0	148.9	83.3	31.0	82	3042	358.4	11.0	22
2015 928Mo	346.9	16	68	308	342	2.255	99t	313.7	1.281	100	200.5	72.6	158.0	92.8	33.5	84	547	316.1	1.5	23
2016 916Fr	1954.0	15	299	14	342	0.934	97	243.3	-0.059	0	0.0	0.0	155.2	90.2	32.8	86	1802	75.5	-3.3	24
2017 210Fr	2543.6	44	37	351	13	1.015	14t	263.4	-0.031	0	0.0	0.0	151.7	85.5	31.7	87	3113	352.4	13.1	25
2017 8 7Mo	1920.1	0	297	202	169	1.315	66t	305.0	0.250	17	116.3	0.0	145.6	81.2	30.3	87	1922	86.2	-15.4	26
2018 131We	1429.5	-14	217	32	10	2.320	102t	320.3	1.320	100	203.3	76.7	157.4	91.1	33.2	88	1635	160.9	17.0	27
2018 727Fr	2121.4	10	324	194	172	2.706	124t	377.4	1.612	100	235.1	103.5	142.4	78.1	29.4	88	1943	56.3	-19.0	28
2019 121Mo	611.9	13	105	149	187	2.194	99t	314.6	1.200	100	197.3	62.8	158.4	91.9	33.4	89	753	284.8	20.3	29
2019 716Tu	2230.5	12	341	8	356	1.731	96t	337.5	0.657	66	178.6	0.0	144.4	80.1	30.0	89	2002	39.0	-21.9	30
2020 110Fr	2009.7	38	283	222	183	0.922	96	248.8	-0.112	0	0.0	0.0	153.7	87.2	32.2	90	1530	74.5	23.0	31
2020 6 5Fr	2024.7	3	314	219	192	0.594	60	203.2	-0.401	0	0.0	0.0	153.5	89.1	32.4	90	1956	68.7	-21.5	32
20211119Fr	1002.6	-16	158	327	341	2.099	114t	365.2	0.978	99	208.9	0.0	143.5	77.4	29.5	91	709	220.8	19.2	33
2022 516Mo	511.1	-12	72	342	20	2.398	103t	321.7	1.418	100	207.8	85.5	155.9	91.3	33.0	92	343	296.2	-19.3	34
2023 5 5Fr	1822.5	-9	289	59	23	0.990	100	261.8	-0.041	0	0.0	0.0	150.2	85.3	31.4	93	1927	98.2	-17.2	35
20231028Sa	2113.7	42	313	182	155	1.144	42t	268.5	0.127	6	78.9	0.0	154.0	88.2	32.3	93	1612	52.1	14.1	36
2024 918We	343.8	14	64	298	331	1.063	27t	250.0	0.090	4	64.5	0.0	157.7	92.7	33.4	95	530	318.1	-2.6	37
2025 314Fr	758.4	-16	117	177	209	2.286	117t	366.2	1.182	100	218.7	66.1	144.4	78.6	29.8	96	605	257.9	2.7	38
2025 9 7Su	1911.3	7	291	6	332	2.370	105t	329.8	1.366	100	210.0	82.8	153.5	88.7	32.3	96	1821	86.8	-6.0	39