Scientific Writing in Astro Lecture #2

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Class/Book on Scientific Writing...

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- 1 Some introduction
- 2 Reading and the logical structure of articles
- 3 Abstracts
- 4 Before you start writing planning, brainstorming
- 5 The body of an article
- 6 Figures, tables, equations.
- 7 Language and Style 1: Sentences to paragraphs
- 8 Language and Style 2: Verbs and punctuation
- 9 Language and Style 3: Style, common mistakes
- 10 Information sources, citations, plagiarism and ethics.
- 11 Criticism and peer review
- 12 Tools for writing, other topics, summary

Body of a paper: why does it matter?

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**Title
Abstract
Keywords
Introduction
Literature review
Data and methods
Results
Discussion
Conclusions/Summary**

Body of a paper: why does it matter?

- reader must know where to find things

- effectively communicate science

- there is room for freedom though!

Exceptions:
review paper
pop.science paper
research proposal (!)

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Keywords
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"Where to find things?"
Nonlinear reading

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- 100% reads abstract

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  ...amongst business managers

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What's your ratio?

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- 100% reads abstract

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- < 50% reads conclusions

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   ...amongst business managers

What's your ratio?

messages to send should be in
Abstract
Intro (?)
Conclusions

Title

- Effective titles…

  Three-Dimensional Quantitative Structure–Property Relationship (3D-QSPR) Models for Prediction of Thermodynamic Properties of Polychlorinated Biphenyls (PCBs): Enthalpies of Fusion and Their Application to Estimates of Enthalpies of Sublimation and Aqueous Solubilities

  The Probability that a Rocky Planet's Composition Reflects its Host Star

  On the nature of VX Sagitarii: Is it a TZO, a RSG or a high-mass AGB star?

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  AGB star?

1. informative
2. accurate
3. clear
4. concise
5. attention raising,
   if possible

___not suggested 1st word:___
the, an, investigation,
observations of...

Author list, affiliations, keywords

Author list, affiliations, keywords

- Choose your name *now* and stick to it

Author list, affiliations, keywords

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- Choose wisely…

Author list, affiliations, keywords

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- Choose wisely…

- middle name initials?

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- your workplace and/or source of income

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- Check the journal's list of accepted/suggested keywords

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- Can be written later on (but not always practical)

Data and methods

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  - complete
  - precise
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- start with overview (big picture), and stay focused

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- tell a story...

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  - explore alternative interpretations
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  - speculations
  - put the picture together
- Make sure it's separate from results:
  - "We speculate that…"
  - "If our results are correct, then the hypothesis offered by Smith (2016) is invalid for the following reasons."

Conclusion, conclusions/summary

Acklowledgment

References

Appendix

Conclusion, conclusions/summary

- where the work *leaves* us and where it *leads* us

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follow journal guidelines

Appendix

Article   vs.   Thesis

- shorter

- concise

- structured

- as long as needed

- may contain many technical details

- structure depends on the project

  - needs: Intro, Methods, Results, Discussion, Conclusion; Abstract

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Pro tipp: start with **Figure captions** first! :)

Final words:

Writing can be a struggle, or it can be fun.

Most likely it is both.

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Let's exercise!

Organize the puzzle!

Do rapidly-rotating massive stars at low metallicity form Wolf–Rayet stars?

D. Szécsi[1], N. Langer[1], D. Sanyal[1], C.J. Evans[2], J. Bestenlehner[3] & F. Raucq[4]

[1] *Argelander-Institut für Astronomie der Universität Bonn, Germany*
[2] *UK Astronomy Technology Centre, Royal Observatory Edinburgh, UK*
[3] *Max Planck Institute for Astronomy, Heidelberg, Germany*
[4] *Institut d'Astrophysique, Liege University, Belgium*

ABSTRACT

1 …

2 …

2.1 …

2.2 …

2.3 …

3 …

References

Homework

- Choose a paper: A&A, MNRAS, ApJ

- Download its template

- Add:
  - title
  - author list
  - sections (lorem ipsum)
  - figures with captions
  - at least 10 references

Make it run in latex without error.