# Massive Star Evolution in the Dwarf Galaxy I Zwicky 18

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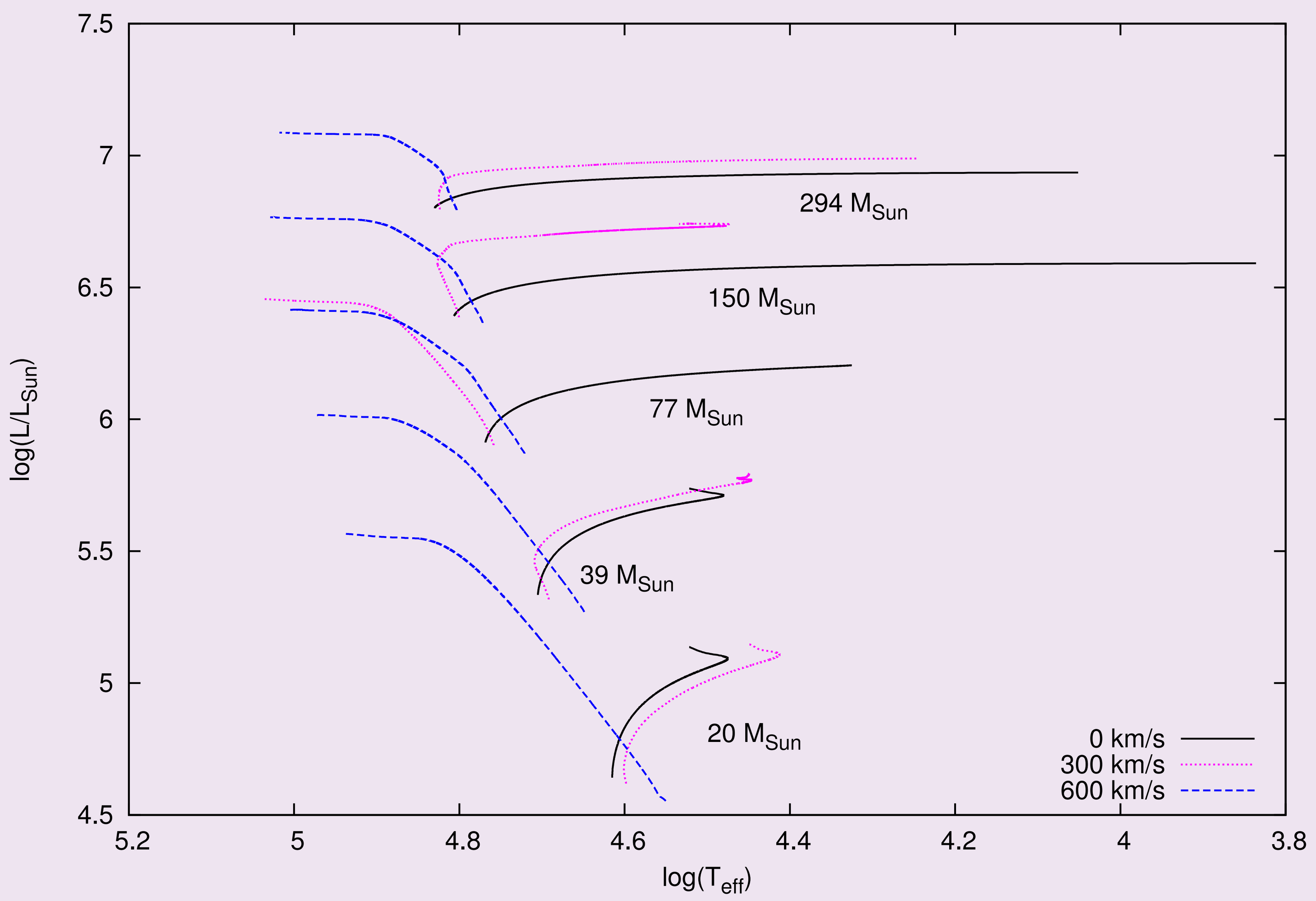
## Introduction

From the study of luminous supernovae and long duration gamma-ray burst, as from observations of chemical anomalies in stars of Galactic globular clusters, evidence has been accumulated that the evolution of massive stars proceeds very differently at low metallicity. Nearby irregular dwarf galaxies provide excellent laboratories for star formation, massive star evolution and chemical enrichment processes. One of the key objects is I Zwicky 18, which has a high SF rate and contains WR stars. We present a large grid of evolutionary tracks of massive, rotating single stars with an initial composition corresponding to that of I Zwicky 18 (~1/50 $Z_{Sun}$, or rather ~1/10 $Z_{SMC}$).

## Sequences on the HR diagram

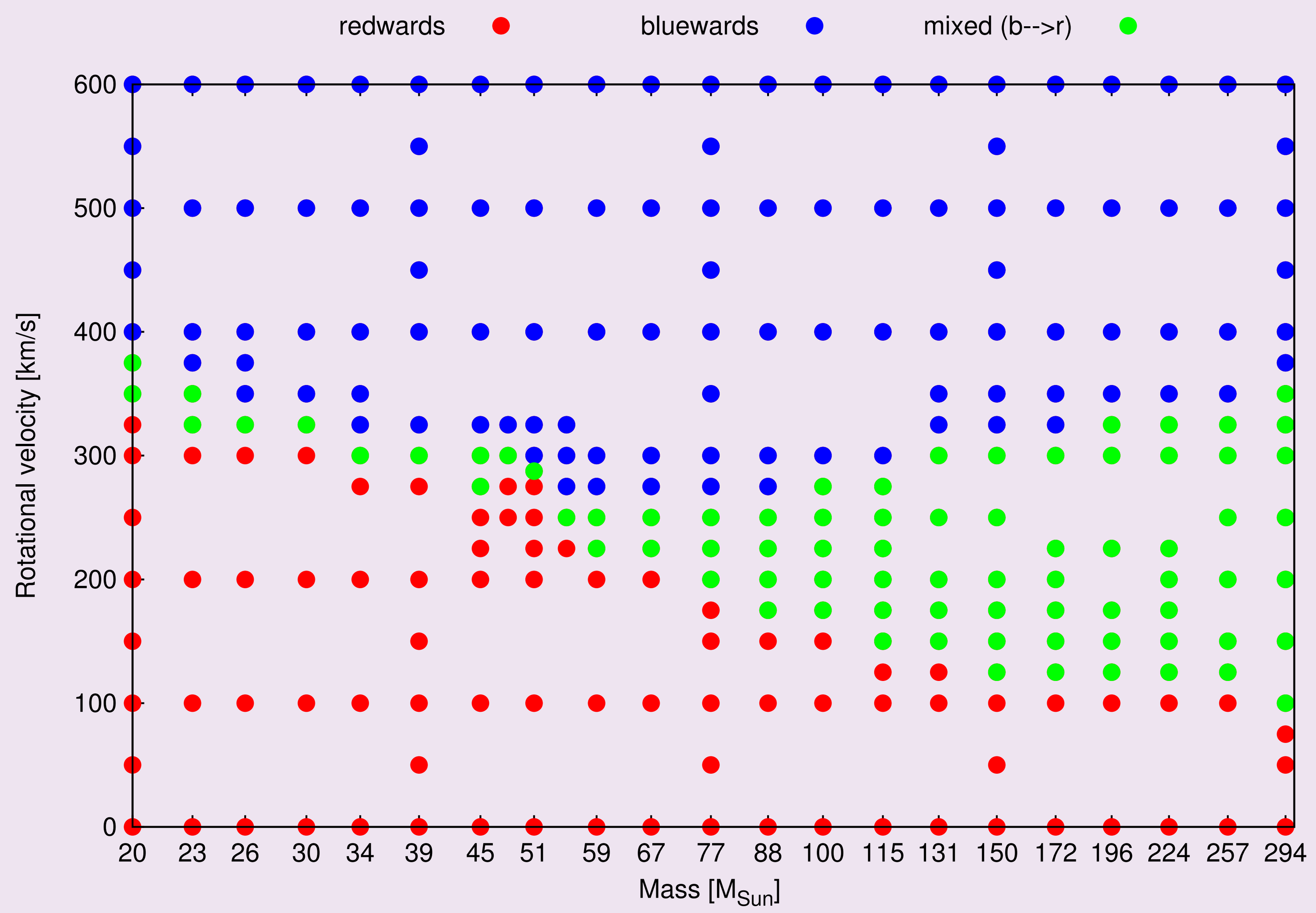



Evolutionary tracks for various masses and rotation rates on the main sequence. Stars that rotate faster than a certain threshold are so efficiently mixed that they evolve almost chemically homogeneously.

## Personal

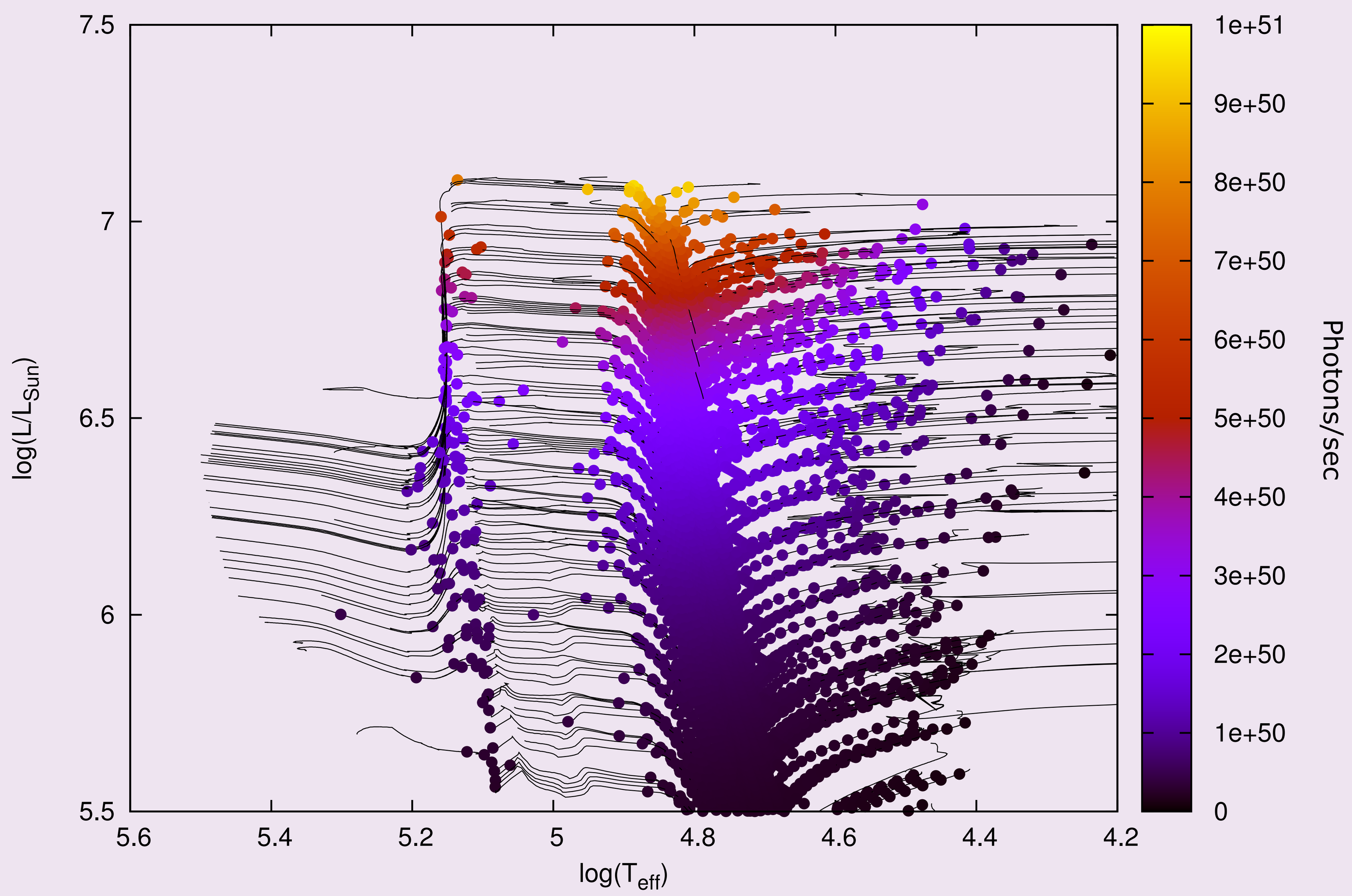
I am currently working on my doctorate in the Stellar Astrophysics Group led by **Prof. Dr. N. Langer**.

## The Grid




The grid contains ~300 evolutionary sequences of single stars in the mass range of 20-300 $M_{\odot}$, with initial rotational velocities between 0-600 km/s. We find a significant fraction of them following a Chemically Homogeneous Evolutionary path (blue points), evolving blueward in the HR diagram and becoming WR stars. Sequences marked with red follow normal evolution initially and become Red Super Giants. Sequences marked with green start their life chemically homogeneous and then they switch to normal evolution.

## Photoionization fluxes




We derived hydrogen ionizing fluxes emitted from our stars assuming Black Body radiation. The coloured points mark every $10^5$ years of the evolution, while the black lines show the evolutionary tracks of all models. The colour coding shows the number of ionizing photons per second emitted form the given model. According to this result, we expect the hottest and most luminous main sequence and Wolf-Rayet stars to ionize the hydrogen in their surroundings.