International Max Planck Research School for Astronomy & Cosmic Physics at the University of Heidelberg

IMPRS

#11

The Alchemy of Tracing the Prevalence of Massive Stars

Jan Rybizki

Centre for Astronomy of Heidelberg University

Supervisor: Andreas Just

Abstract

Using Bayesian inference together with a local Milky Way disk model ([1,2]) we map the effect of a universal initial mass function (IMF) into the space of observables and constrain its parameters using high quality data.

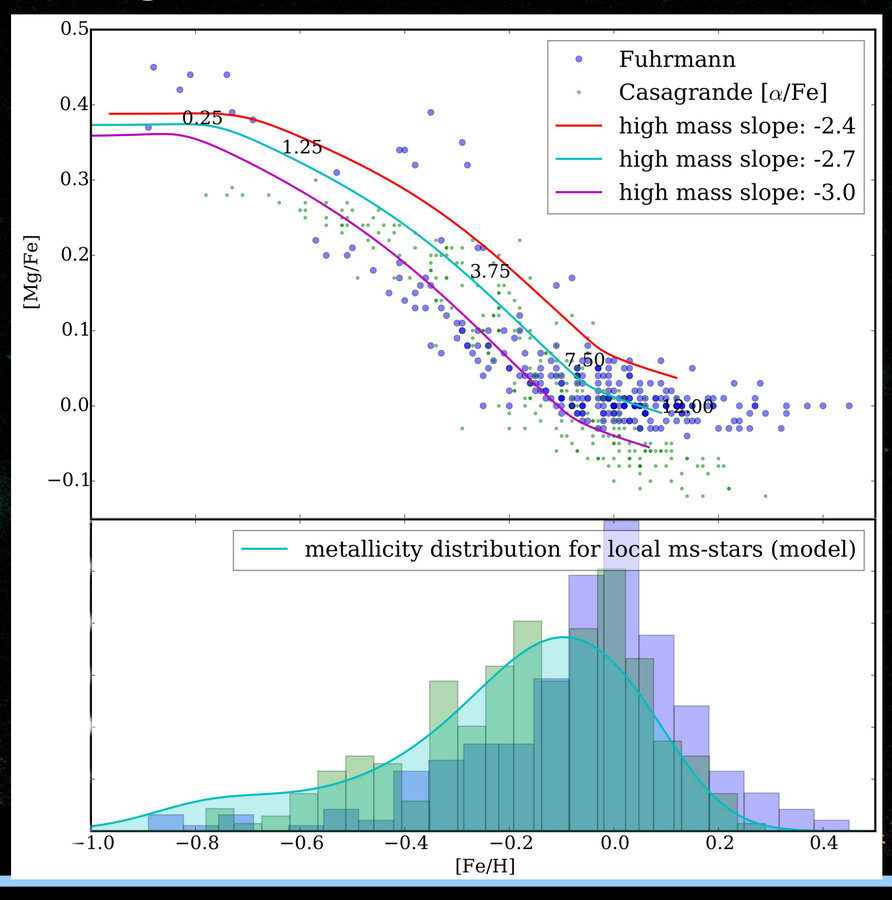
In a prove of concept we exploited Hipparcos starcounts resulting in tight constraints of the IMF up to 8 M_sun ([3]).

Now including a model for chemical enrichment we want to reliably determine the high mass slope of the IMF.

Introduction

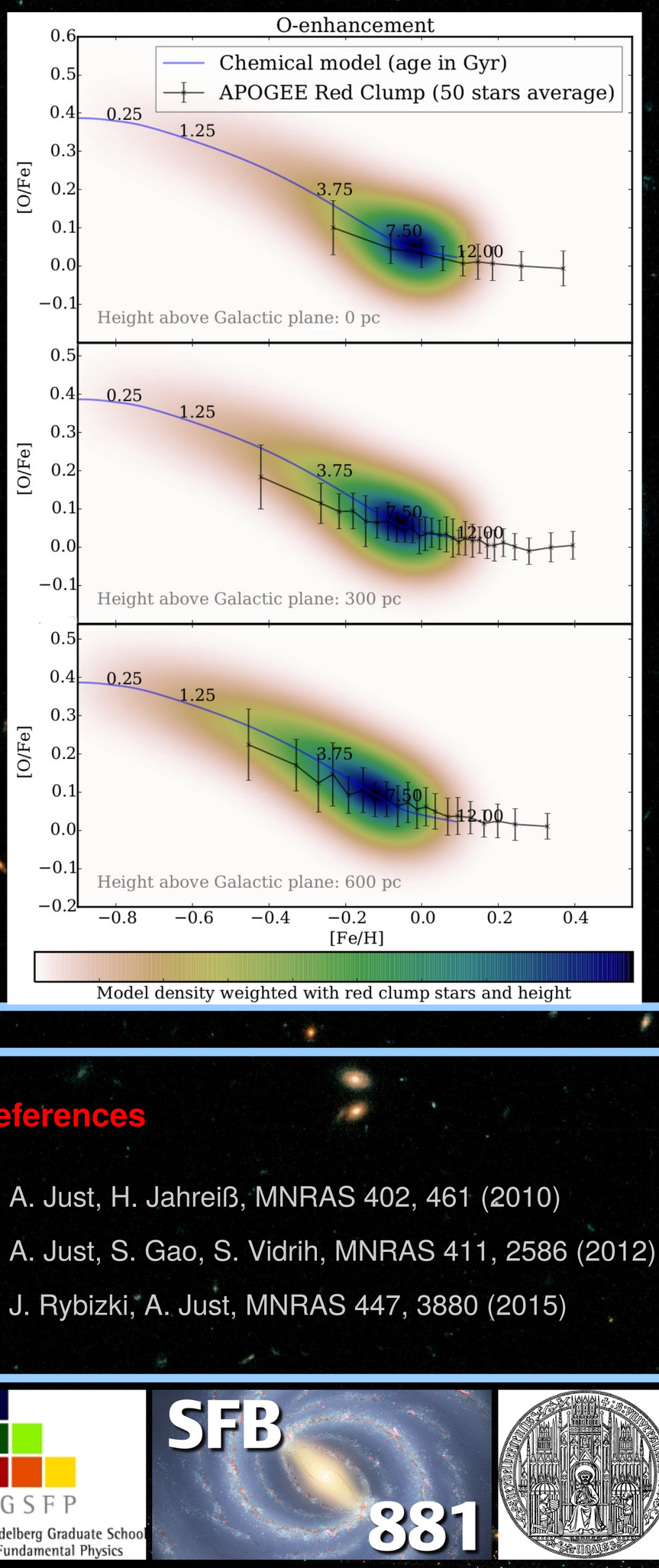
We model the chemical evolution with *Chempy* a versatile enrichment code able to adjust all input parameters while fulfilling selected observational boundary conditions.

The high mass slope of the IMF impacts the resulting abundance distribution.



Results & Discussion

Being able to weight the elemental abundances with the age-distribution of stellar populations (e.g. red clump stars) and height above the Galactic plane helps to enhance the discriminative power of data.



References

[1] A. Just, H. Jahreiß, MNRAS 402, 461 (2010)

[2] A. Just, S. Gao, S. Vidrih, MNRAS 411, 2586 (2012)

[3] J. Rybizki, A. Just, MNRAS 447, 3880 (2015)

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