

**List of available Master projects**  
**Dwarf Galaxies and the Galactic Halo (DGGH) Section**  
**Milky Way and Local Volume (MWLV) Section**

Title: Testing the luminosity function of AGB stars using multi-epoch observations

Supervisor: Prof. Dr. Maria-Rosa Cioni

Abstract: The distribution of the number of asymptotic giant branch (AGB) stars as a function of magnitude is an important diagnostic for their evolution. In particular, it allows us to establish the efficiency of the third-dredge up and mass loss processes by comparing observed distributions with those obtained from stellar evolutionary models. Most AGB stars are long period variables, i.e. they experience periodic variations in magnitude. This project aims to explore the influence of the variability of AGB stars onto their magnitude distribution in order to establish if this has a significant influence on the comparison with stellar evolutionary models. The student will select AGB stars from near-infrared observations of the Magellanic Clouds and produce histograms of magnitude distributions at different epochs. The different distributions will be statistically compared among each other and with mean distributions created from the mean-magnitude of the light-curve variations of AGB stars.

References: Marigo, Girardi, Bressan (1999, A&A 344, 123); Pastorelli et al. (2019; in preparation)

Title: Populations and chemistry of stars in the Milky Way with RAVE and other spectroscopic surveys

Supervisor: Prof. Dr. Matthias Steinmetz

Abstract:

References:

Title: Galactic Archeology with the Pristine survey: the most metal-poor stars in the Milky Way

Supervisors: Dr. Else Starkenburg, PhD student Anke Arentsen

Abstract: The oldest stars in the Milky Way are expected to be extremely metal poor, because the gas out of which they were born in the early Universe had not yet been enriched by many supernova events. These rare stars provide valuable insights into the conditions in the early Universe and the history of the Milky Way. The Pristine survey is very efficient at finding these metal-poor stars in several regions of the Milky Way (the halo, the bulge and in dwarf galaxies) and has been collecting a lot of data over the past few years. There are several possibilities for student projects with the available photometric and spectroscopic data.

References: <https://sites.google.com/view/pristinesurvey/about-pristine>