

Alice Minelli



Title

Unveiling the chemical composition of the Small Magellanic Cloud

Abstract

The Small Magellanic Cloud (SMC) is an excellent laboratory to investigate the chemical enrichment history of a galaxy that has experienced strong gravitational interactions with other systems, since it is in an early stage of a minor merger event with the Large Magellanic Cloud. Despite its proximity (~ 60 kpc) and the possibility to resolve its stellar content, the chemical composition of the SMC is still poorly known.

In order to fill this gap and to accurately reconstruct the chemical evolution of the stellar populations in the SMC, we analysed FLAMES@VLT high-resolution spectra of about 200 red giant stars belonging to the SMC field. Additionally, we analysed stars members of three SMC clusters with different ages (~ 11 , ~ 6 and ~ 1 Gyr) covering the entire range of ages of the SMC clusters system. This dataset allows to reconstruct the role played by the different contributors to the chemical enrichment, i.e. Type II and Ia supernovae, hypernovae, AGB stars.

In particular, most of the stars (both in field and clusters) have solar-scaled $[\alpha/\text{Fe}]$ ratios, indicating that they formed from a gas already polluted by Supernovae Type Ia. Among the field stars we identified a bunch of rare SMC metal-poor stars ($[\text{Fe}/\text{H}] < -2.0$) that allow to study for the first time the early chemical enrichment of the galaxy. Finally, we found the evidence of the presence of a metallicity gradient within the SMC, with metallicity decreasing moving outward.

Alice Minelli

PhD Student in Astrophysics at the University of Bologna
Curriculum Vitae



Personal information

- Name Alice Minelli
- Birth 21/10/1994 , Modena (MO)
- Contact E-mail: alice.minelli4@unibo.it
Telephone: +39 051 20 9 5791
Address: Department of Physics and Astronomy,
via Gobetti 93/2, I-40129, Bologna, Italia

Education

- Actual position Ph.D. student position in Astrophysics at the University of Bologna (2018 – in progress, duration 3 years)
- Degrees Master degree in Astrophysics and Cosmology at the University of Bologna (2016-2018)
Thesis: Chemical and kinematic analysis of RGB stars in the Large Magellanic Cloud
Bachelor degree in Astronomy at the University of Bologna (2013-2016)

Research

- Main scientific interests Chemical characterization of resolved stellar populations in the Milky Way satellites
- Papers An homogeneous comparison between the chemical composition of the Large Magellanic Cloud and the Sagittarius dwarf galaxy – A. Minelli et al., submitted
Chemical analysis of three SMC globular clusters of different age – A. Minelli et al., in preparation
- Contributed talk “A spectroscopic high-resolution comparison between LMC and Sagittarius dwarf galaxy” , ESO workshop, Munich, 2019
- Poster “Chemical and Kinematic study of Large Magellanic Cloud RGB stars” , IAUS 351, Bologna, 2019