

STELLAR CLUSTERS: FROM THE GALACTIC DISK TO THE MAGELLANIC CLOUDS

Open clusters are stellar systems that primarily reside within the galactic thin disk. These structures play a crucial role in confirming the radial gradients of metallicity and abundances that define the disk structure of our Galaxy. Furthermore, they serve as important tools in studying stellar formation and evolution theories. The chemical elements act as tracers of the stellar evolutionary phases, and the abundance analysis allows for the examination of stars that originated from the same molecular cloud and have undergone similar evolutionary processes. The main results from the high-resolution spectroscopic analysis of main sequence, subgiant, and RGB-giant stars across various open clusters are detailed in several studies, including Katime Santrich, Pereira & Drake (2013a); Katime Santrich, Pereira & de Castro (2013b); and Katime Santrich, Kerber, Abuchaim & Gonçalves (2022). Notably, these studies led to the discovery of “Yellow Straggler Stars (YSS)” as reported by Sales Silva, Peña Suárez, Katime Santrich et al. (2014). These stars exhibit unique photometric and spectroscopic characteristics that distinguish them from the other cluster members, such as not fitting any known isochrone despite being part of the cluster, potential binarity, and systematic veiling in their spectral absorption lines. It is hypothesized that these objects might be blue stragglers in transition toward the subgiant phase. Additionally, this presentation highlights the identification of candidates for the first extragalactic YSS observed in the Magellanic Clouds. This discovery is based on photometric observations of stellar clusters conducted as part of the VISCACHA survey project (more details about the survey on the website <http://www.astro.iag.usp.br/~viscacha/>).

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