

Highlight

CLASSICAL PULSATORS AS POPULATION TRACERS: A JOURNEY TO
THE FAR SIDE OF THE MILKY WAY

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Half of our Milky Way galaxy is located in a narrow stripe of the sky along the Galactic Equator, disguised by interstellar dust, which has been hindering efforts to map the far side of the Galaxy with stellar tracers, until now. Deep, time-resolved photometric surveys now enable us to probe these regions using distant pulsating stars.

We have been leveraging near-infrared time-series photometry from the VISTA Variables in the Vía Láctea (VVV) Survey to conduct a deep census of Southern Galactic Cepheids and RR Lyrae stars, accurate standard candles and well-understood population tracers. These valuable beacons enable us to probe the youngest and the oldest stellar populations in the bulge and at the far side of the Galactic disk, toward high-extinction regions which are out of the reach of all other ongoing and future surveys. By complementing the photometry of these objects with kinematical and elemental abundance measurements, we will be in the position to probe the structural and chemodynamical properties of the Milky Way over its complete extension, and infer global properties of the Galaxy such as general symmetry, spiral arm configuration, bulk kinematics, and metallicity distribution.

In my talk, I will present the current status of this collaborative project, and discuss our efforts to tackle the challenges of infrared light-curve classification and distance analysis with a space-varying extinction curve. I will summarize new results based on the deep census of RR Lyrae stars and both classical and type II Cepheids in the 4th Galactic quadrant and toward the inner bulge. I will highlight new insights into the spatial and metallicity distribution of the primordial Galactic bulge and disk populations, the mapping of the space-varying extinction curve toward the inner Galaxy, and probing into distant regions of the thin disk. Finally, I will outline future prospects with the upcoming VVV Extended Survey and the important role of synergies with the OGLE, GLIMPSE, and Gaia surveys.