**Characterizing evolved Galactic stellar population: A challenge for astrometric measurements**

Current radio surveys target stellar maser beacons to investigate different Galactic structures (arms, bulge, and bar) in the Galactic plane. Together with IR photometry, these follow-up radio-astrometric measurements are complementary to Gaia results since the inner plane of the Galaxy is obscured at optical wavelengths. Moreover, by cross-matching samples between radio, IR, and optical surveys important clues on intrinsic stellar properties on intrinsic stellar properties of the targets, characterization of stellar populations in the Galactic plane, and stellar cluster associations can be drawn. However, this only can be done for a small sample (~10%) where the astrometric measurements from Gaia are good enough to directly obtain absolute stellar properties. In this talk, I show how additional astrometric information can be obtained and refined following novel approaches: (1) statistical photometric methods to obtain a distances when negative or bad parallaxes are measured assuming that one knows the population of the target stellar objects, and (2) a proof-of-concept called “Shared Astrometry” that aims to obtain accurate astrometry at high frequencies when no suitable background calibrators are available and where all sources including the astrometric reference sources move significantly between observations.