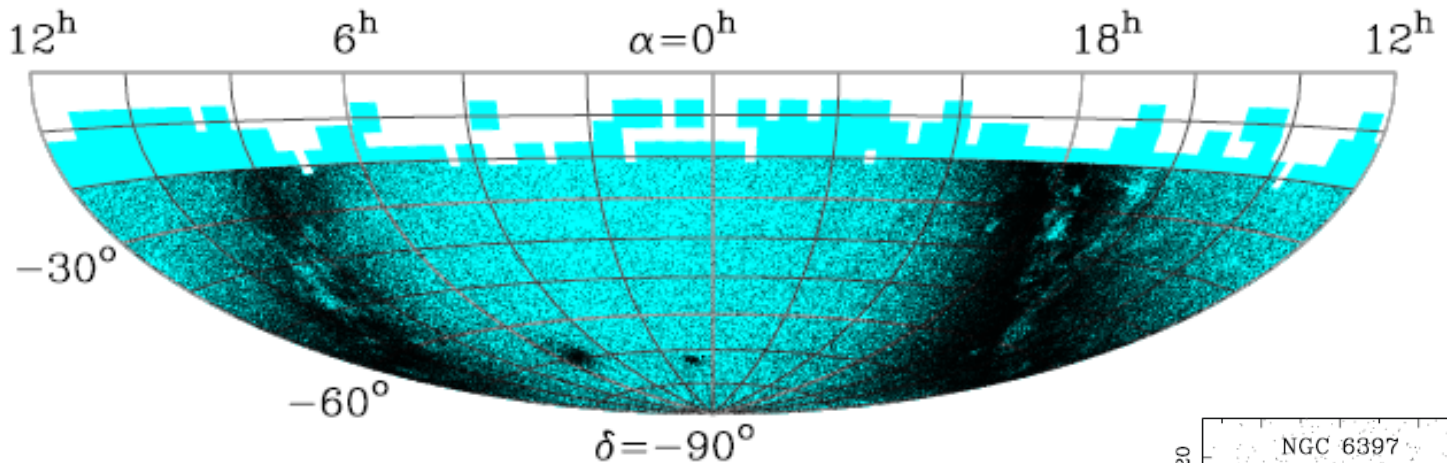
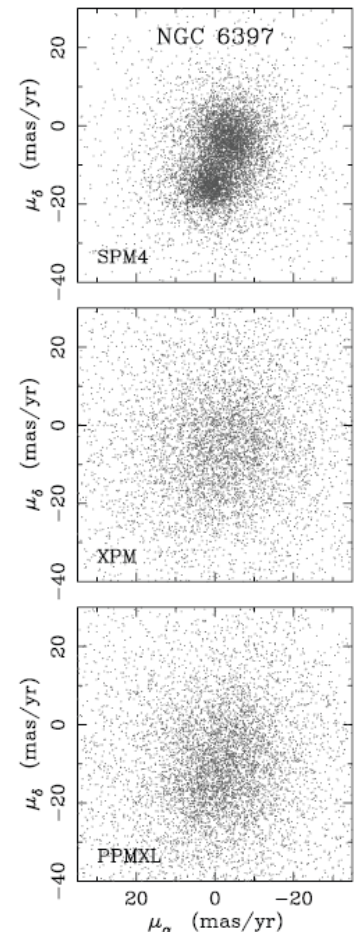


The Southern Proper Motion Program



Accurate positions and proper motions (the angular displacement of a star in the sky over time) are an essential ingredient for obtaining (in combination with distance estimates and radial velocities) full space motions of stars in the Galaxy. This information, when combined with chemical abundances, allows for detailed studies of the nature of the halo and disk systems of the Galaxy, and the environments in which early generation stars formed.

JINA researchers have participated in the assembly of the fourth installment of the Yale/San Juan Southern Proper Motion Catalog, *SPM4*. The *SPM4* contains absolute proper motions, celestial coordinates, and *B, V* photometry for over 103 million stars and galaxies between the south celestial pole and -20 degrees declination. The proper-motion precision, for well-measured stars, is estimated to be $2-3 \text{ mas yr}^{-1}$, depending on the type of second-epoch material. Systematic uncertainties in the absolute proper motions are on the order of 1 mas yr^{-1} .



Comparison of *SPM4*, *XPM*, and *PPMXL* catalogs in the field of NGC 6397. The proper-motion vector point diagrams are of all objects within a $30 \text{ arcmin} \times 30 \text{ arcmin}$ region centered on the cluster. The top panel shows *SPM4* proper motions, the middle panel shows the *XPM* proper motions, and the bottom panel shows *PPMXL* proper motions. The field-star and cluster distributions are readily discernible only in the *SPM4* data.

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