

**Abstract:** The availability of full 6-D phase-space information for stellar tracers of the Milky Way has increased vastly over the past decade, especially in the solar neighborhood. However, further out in the halo, proper motions are either untenable due to large errors or unavailable completely. I will describe ongoing efforts to remedy this aimed at tracers that sample the Milky Way halo at a large range of distances: the inner stellar halo, the Sagittarius Stream and Globular Clusters, and the Magellanic Clouds. I will also describe efforts to expand the number of reference QSOs suitable for space-based astrometry.