STELLAR HALOS AS TRACERS OF DARK MATTER ASSEMBLY AND CHEMICAL ENRICHMENT ON GALAXY SCALES

Abstract

The history and fate of the Universe are determined by the tussle between dark energy and dark matter, two entities whose nature is poorly understood at the present time. On the scale of an individual galaxy, the gravitational potential of its associated dark matter halo determines the kinematics of visible baryons and allows for the chemical recycling that makes it possible for stars and planets to contain the full range of elements in the periodic table. My talk will focus on observational studies of the dynamics and chemical enrichment of stars and star clusters in a few different galactic components and environments including the Milky Way (MW), Andromeda galaxy, other nearby MW analogs, and the Virgo cluster of galaxies. I will present: chemical abundance as a function of gravitational potential among MW/Andromeda dwarf satellite galaxies; trends in halo substructure that provide clues to its assembly history; evidence of dynamical heating of Andromeda’s disk; and the discovery of two populations of Virgo cluster globular clusters.