

PHYSICS AND ASTRONOMY SEMINAR

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"Inferring the Galactic Gravitational Potential"

Abstract

The distribution of dark matter in our Galaxy is an important constraint on theories of dark matter and structure formation, yet currently is very poorly understood. The Gaia astrometric space mission, which launches this winter, will make huge strides in understanding the distribution of mass in our Galaxy by precisely measuring the six-dimensional phase space positions of 150 million stars. In this talk I show how Gaia observations of stars in the tidal streams of the accreted Galactic halo can be used to infer the halo's total gravitational potential, by exploiting the natural clustering of stream stars in action space. Tests with a spherical mock halo show that for a Gaia-like selection function and error model, the number of streams we expect to find in the accreted halo is well above the number needed to determine the two parameters of this toy potential. I will discuss the expansion of the technique to more realistic models of the potential, and the prospects given improvements in data quality from complementary ground-based surveys like LSST and WEAVE.

Friday, December 06, 2013 10:30 a.m. Elliott Building Room 061