PHYSICS AND ASTRONOMY
SEMINAR

Dr. Mike Boylan-Kolchin

University of California Irvine

"Near-Field Cosmology: Big Science with Small Galaxies"

Abstract

Dwarf galaxies are the most metal-poor and dark matter-dominated galactic systems known, and they therefore provide a unique window onto galaxy formation and the nature of dark matter. I will present predictions from N-body simulations based on the standard dark energy plus cold dark matter cosmological model for the abundance and structure of low-mass galaxies around the Local Group, highlighting potentially serious discrepancies between these predictions and observations. I will then discuss how baryonic processes or non-standard dark matter physics may modify this picture, and how the next generation of ground and space-based telescopes, coupled with more advanced numerical simulations, will vastly improve our knowledge. Finally, I will describe how studying the Local Group can guide our understanding of galaxy formation at cosmic dawn, and conversely, how observations of the high-redshift Universe can inform models of nearby galaxies.

Wednesday, March 06, 2013
11:00 a.m.
Elliott Building
Room 161