

SAN DIEGO STATE UNIVERSITY DEPARTMENT OF PHYSICS AND DEPARTMENT OF
ASTRONOMY COLLOQUIUM

Speaker: Dr. Kate Rubin (Harvard-Smithsonian Center for Astrophysics)

Topic: Mapping the Cool Baryons: Toward a Physical Picture for Galaxy
Evolution

Time: 3:00 PM, Friday, February 26, 2016 (refreshments served at 2:45 PM)

Place: Room 215, Physics-Astronomy Building (PA-215)

Abstract:

Current models of galaxy formation require that the buildup of galactic stellar mass proceeds at a rate much slower than the rate at which gas is accreted onto dark matter halos, with only $\sim 6\%$ of the cosmic energy density of baryons ending up in stars by today. QSO absorption line experiments indicate that the environments extending several hundred kiloparsecs from typical galaxies serve as massive reservoirs for the remaining material; however, the mechanisms which prevent the cooling and collapse of this diffuse baryonic component remain poorly understood. I will discuss my efforts to constrain the physics of galaxy formation by developing a set of empirical measurements of the incidence, mass, spatial distribution, and energetics of outflowing and accreting gaseous material around galaxies. Using novel experimental design implemented with programs on the Keck and Very Large Telescopes and with the new SDSS-IV/MaNGA survey, I will present unique constraints on the surface density and size of metal-enriched regions around galaxies, as well as analysis of the spatially-resolved kinematics of cool material along the line of sight to galaxies over the past ~ 8 billion years. Finally, I will discuss the potential of these observational techniques, used in combination with next-generation optical facilities, to revolutionize our understanding of the processes regulating galaxy growth.