

Physics Department Colloquium

“Astrophysical Disks in a LCDM Universe: A key to Fundamental Physics and Galaxy Formation”

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Understanding the formation and evolution of structure in the Universe constitutes one of the fundamental goals of astrophysics. Over the past two decades, the LCDM cosmological model of hierarchical structure formation has emerged as the dominant paradigm in this pursuit owing to its remarkable ability to explain a plethora of observations on large scales and at various cosmic epochs. Supercomputer simulations are the ideal means by which to relate theoretical models with observational data, and advances in algorithms and supercomputer technology have provided the platform for increasingly realistic astrophysical modeling. Using high-resolution numerical simulations set within the LCDM paradigm I will investigate the response of large-scale galactic disks to the hierarchical assembly of structure, the transformation of typical disk galaxies to the most dark matter dominated galaxies in the Universe, and the role of small-scale nuclear disks in the fueling of supermassive black holes (SMBHs) and the formation of SMBH binaries in galaxy mergers. Utilizing these results I will emphasize the importance of astrophysical disks in comparing theory with observations and highlight the predictive power of the LCDM theory on all scales.

Thursday, March 5, 2009

4:00 PM in 102 JFB

Refreshments served, 3:30 in 219 JFB