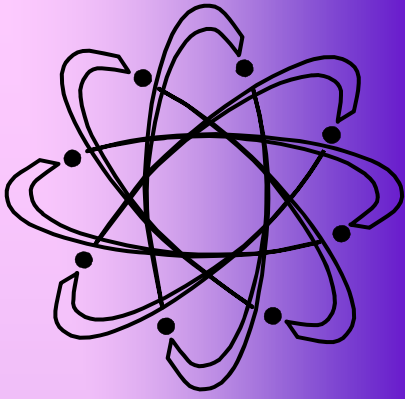


The Department of
Physics



Carnegie Mellon

Special Cosmology Colloquium

Neal Dalal

CITA

University of Toronto

“The Handwaver’s Guide to Dark Matter Halos”

Monday, January 24, 2011

1:00pm

Doherty Hall A301D

Abstract:

Dark matter halos are the endpoints of cosmological structure formation. They play a crucial role in many areas of astrophysics and cosmology. Our understanding of halos is based almost entirely on numerical experiments in N-body simulations, with relatively poor theoretical understanding of what determines halo properties. In my talk, I will try to give a simple way to understand many properties of halos, including their density profiles, their abundance, and their clustering.

Using an extremely simple model, it is possible to match the results of N-body simulations across a wide range of cosmologies, even better than commonly used empirical fitting formulae. Using this approach, we can also predict how halos and their resident galaxies behave in cosmologies that depart from the standard LCDM model, which I will illustrate with some examples.