UCDAVIS PHYSICS

Department of Physics
University of California
One Shields Avenue
Davis, CA 95616

530-752-1500

Cosmology Seminar

DR. Salman Habib

Los Alamos National Laboratory

Title: Percolation and the Large Scale Structure of the Universe

Abstract: The large-scale structure of the Universe, as traced by the distribution of galaxies, is now being revealed by large-volume cosmological surveys. The structure is characterized by galaxies distributed along filaments, the filaments connecting in turn to form a percolating network. In addition to conventional statistical measures such as two-point functions and power spectra, percolation theory provides a useful set of global quantitative measures of cosmological structure. In this talk, as a first introductory example, I will discuss the application of percolation to statistics of cosmic voids. I will then discuss how a combination of percolation-based analyses and N-body simulations of the gravitational instability can provide insights into the formation of the cosmic network. In particular, the properties of the network are seen to originate in the properties of the initial density field ("nature") and how its contrast is then amplified by the nonlinear evolution of the Universe ("nurture").

Thursday November 15, 2007

12:10 - 1:30PM - Room 416 PHY/GEO