



University of Miami, Physics Department Seminar

Date: Friday, Oct 24, 2025
Time: 11:00 am – 12:00 pm
Location: Physics Conference Rm, Knight Physics Building

Machine Learning in Cosmology with Gravitational Lensing

Prof. Bhuvnesh Jain

University of Pennsylvania

Abstract

Evolving dark energy is the third cosmic puzzle that may shake our standard model of cosmology. These puzzles have added new questions to resolve in empirical cosmology. I will describe how we map dark matter from large surveys of galaxies via gravitational lensing. Testing theories of cosmology with maps of galaxies and dark matter is a rich area for ML. I will describe the 'old-fashioned' physics-based approaches and the competing deep learning ones. Extracting information from maps on the curved sky also has challenges in common with climate modeling and other fields — I will give a few examples.