Physics Colloquium

"Mass Measurements of Black Holes in X-Ray Transients: Adventures in Astrostatistics"

Dr. Will M. Farr
Center for Interdisciplinary Research and Exploration in Astrophysics
Northwestern University

Friday November 2, 2012
4:10 – 5:00 pm, EPS108

Abstract: Dealing with the special challenges of statistical analysis and modeling of astronomical data, the field of astrostatistics has grown apace with the data sets produced by astronomical observations. Here I will tell the story of a detailed statistical analysis of the mass function of black holes in X-ray binary systems. Any constraints on the mass function have the potential to impact our understanding of high-mass stellar evolution, the dynamics of supernova explosions, and to enhance our ability to predict the outcome of observations by the upcoming Advanced LIGO gravitational wave detectors. But, reliable analysis of the mass function must grapple with observational biases, the unavailability of detailed theoretical models, and the unreliability of measurements of black-hole masses in these systems. I will discuss how our team addressed these challenges, the constraints we have obtained and their implications, and the broader lessons for astrostatistical investigations than can be drawn from our work.

Host: Nico Yunes

Refreshments 3:45 p.m.
EPS 2nd Floor Atrium