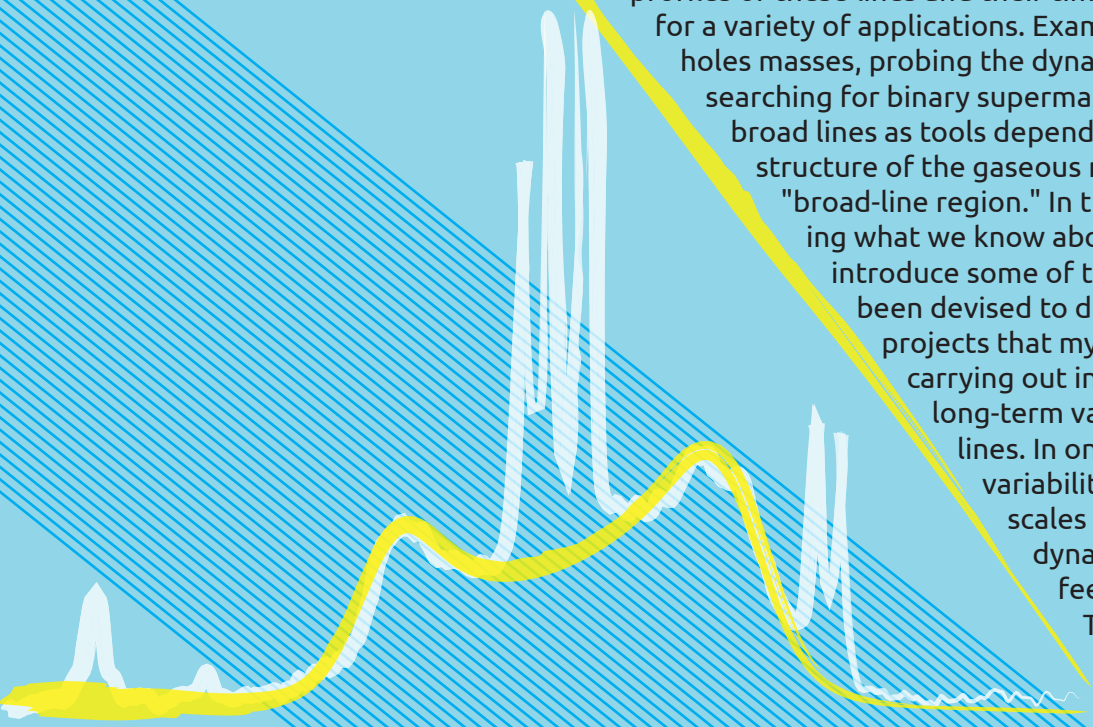
Astrophyiscs Seminar Series

Mike Eracleous

The Pennsylvania State University

Observing the Dynamics of Accretion Disks Around Supermassive Black Holes in Quasars



The broad emission lines found in the spectra of quasars are a hallmark and defining characteristic of this class of astronomical object. They are thought to originate in dense (by astrophysical standards) gas that is in close proximity to the central supermassive black hole. The profiles of these lines and their time variability are now used as tools for a variety of applications. Examples include estimating black holes masses, probing the dynamics of the accretion flow, and searching for binary supermassive black holes. The utility of the broad lines as tools depends on our understanding of the structure of the gaseous medium that emits them, the "broad-line region." In this talk I will begin by summarizing what we know about the broad-line region and introduce some of the physical models that have been devised to describe it. I will then talk about projects that my collaborators and I have been carrying out in which we make use of the long-term variability of the broad emission lines. In one of these projects we exploit the variability of the line profiles on time scales of several years to probe the dynamics of the accretion disk that feeds the supermassive black hole. Through these studies we are arriving at a picture in which the accretion disk is massive and self-gravitating.

Tuesday, 19 Sept • 3:30 PM

Bell Room (103) • Rutherford Physics Building