



PHYSICS AND ASTRONOMY SEMINAR

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“The Co-growth of Galaxy Disks and Black Holes Across Cosmic Time”

Abstract

The early emergence of central supermassive black holes and their correlation with host galaxy properties remains one of the major unsolved problems in astronomy. In the past decade there has been great progress on including black holes, and associated feedback processes, into cosmologically-based models of galaxy formation. Most of these have been based on the principle of Bondi accretion, with the associated feedback carefully tuned to match the observed relation between galaxy bulge mass and black hole mass. I will discuss a new scenario to grow black holes, based on the idea of secular instabilities in galaxy disks that dissipate torque. Using high-resolution zoom hydrodynamical simulations, we show how such torque-limited accretion provides a more natural and straightforward explanation for early black hole growth as well as late-time scaling relations, and discuss how the latest Hubble observations of active black holes support this scenario. If correct, our models provide new insights into the evolution of supermassive black holes and their impact on their host galaxies across cosmic time.

Tuesday, January 13, 2015
2:30 p.m.
Elliott Building
Room 161