



PHYSICS AND ASTRONOMY COLLOQUIUM

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“Dark Matter and Black Holes across Cosmic Time”

Abstract

The standard cosmological model successfully reproduces the properties of the universe on supergalactic scales. However, it is unclear whether it can match the detailed properties of galaxies themselves. In particular, the origin of spheroidal galaxies is currently a point of discord between observation and the standard hierarchical model. For example, the stellar populations properties and sizes of massive galaxies are difficult to reproduce by models. Surprisingly, in the past decade it has become clear that supermassive black holes might be an essential ingredient to solve this puzzle: they are found ubiquitously at the center of spheroidal galaxies and their mass correlates with global properties of the host. Furthermore my work, and that of others, has shown that global properties of spheroidal galaxies also correlate very tightly with those of their dark matter halos. A unified description of dark matter, baryons and black holes seems thus necessary to explain the observed correlations, and could perhaps reconcile the standard model with the conflicting observations. I will present highlights of my observational research program aimed at measuring the evolution over cosmic time of black holes, stars, and dark matter in spheroidal galaxies.

Wednesday, February 01, 2012

3:30 p.m.

Bob Wright Centre

Room A104