

**Carnegie Mellon University
Department of Physics**

McWilliams Center for Cosmology

Colloquium

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**Tuesday, September 1, 2009
4:30 pm
DH A301D**

“THE FIRST GALAXIES AND SEED BLACK HOLES”

Abstract:

Scenarios for the assembly of massive black holes (MBHs) trace their hierarchical build-up far up in the galaxy merger tree. The first active nuclei may have started shining a few hundred megayears after the big bang, permeating the universe with x-ray photons, changing the chemistry of primordial gas, and making the intergalactic medium glow at 21 cm wavelengths. The spin distribution of MBHs, the formation and coalescence of MBH binaries, and the impact of gravitational wave recoil will be discussed. Decaying MBH binaries will eject hypervelocity stars, enhance stellar disruption rates, shape the innermost central parsec of galaxies, and will be detected in significant numbers by the LISA satellite.