

# Physics Department Colloquium

## “On the Mass of Massive Galaxies”

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In addition to their intrinsic astronomical interest, the most massive galaxies in the universe are central to quantitative tests of the Lambda-CDM (dark energy plus cold dark matter) model of physical cosmology on scales large and small. How massive are they, and how is their mass distributed? Such basic and important questions are surprisingly difficult to answer. Strong gravitational lensing -- the dramatic distortion and multiple imaging of distant galaxies and quasars by the gravity of intervening objects -- offers an especially powerful tool for measuring galaxy masses, but it has historically been limited by small and heterogeneous samples of lensing galaxies. I will present results from the Sloan Lens ACS (SLACS) Survey, which has changed this situation decisively by discovering nearly one hundred new galaxy-scale strong lenses through the combination of Sloan Digital Sky Survey spectroscopy with Hubble Space Telescope imaging. We have found that massive elliptical galaxies form a two-parameter family in luminosity space (as has been known for over 20 years) but only a one-parameter family in mass space. I will place these strong-lensing results in the context of open questions and results from other techniques, and offer a vision for future observational and analytical directions.

**Thursday, January 22, 2009**

**4:00 PM in 102 JFB**

**Refreshments served, 3:30 in 219 JFB**