

**McWilliams Cosmology Center
Department of Physics
Carnegie Mellon University**

SEMINAR

Thursday, April 28, 2011 @ 4:30 pm

Doherty Hall A301D

David Weinberg, Ohio State University

“Cosmological Highlights from the Sloan Digital Sky Survey”

I will describe some of the scientific highlights from the Sloan Digital Sky Survey (SDSS), concentrating on those connected to cosmology and galaxy formation. The SDSS is the most ambitious survey of the universe ever undertaken. In its first two phases (SDSS-I and II), the survey imaged 11,500 square degrees and detected more than 350 million objects; it also measured the spectra of 930,000 galaxies, 120,000 quasars, and 460,000 stars to create the largest ever 3-dimensional maps of cosmic structure, and it discovered more than 500 Type Ia supernovae to measure the expansion of the universe over the last 5 billion years. Cosmological achievements from SDSS-I and II include: probing the epoch of reionization with the most distant known quasars; comprehensively characterizing the properties of galaxies and the relations between galaxies and their parent dark matter halos; discovering ubiquitous substructure in the outer Milky Way and more than a dozen new companion satellite galaxies; and, through its precision measurements of structure on very large scales, providing a central pillar of the standard cosmological model based on inflation, cold dark matter, and dark energy.

I will describe the current status and early science results of SDSS-III, the ongoing phase of the SDSS, with special attention to the Baryon Oscillation Spectroscopic Survey (BOSS), which seeks to pin down the cause of accelerating cosmic expansion through percent-level measurements of the expansion history.