

McWilliams Center for Cosmology Colloquium

Dr. Judd Bowman
California Institute of Technology

“The Dawn of 21 cm Cosmology”

Tuesday, February 23, 2010

4:30pm

WEH 7316

How did the homogeneous and energetic universe that immediately followed the Big Bang evolve into the rich populations of giant clusters, galaxies, stars, and planets that we see today? Connecting these disparate times requires a detailed understanding of the evolution of hydrogen in the early universe. I will focus on use of two strategies to characterize interactions between primordial hydrogen and the very first generations of stars, black holes, and galaxies less than 700 million years after the Big Bang. The Murchison Widefield Array (MWA) and the Experiment to Detect the Global EoR Signature (EDGES) exploit different observable properties of the 21 cm hyperfine transition line of neutral hydrogen to probe the cosmological Dark Ages and subsequent epoch of reionization (EoR). Both instruments have recently passed important milestones and will soon open new views of the early universe.

In particular, for the first time ever, EDGES has used observations of the highly redshifted 21 cm line to rule out rapid reionization histories between redshifts 6 and 13. I will report the latest results from EDGES and MWA.

