

McWilliams Center for Cosmology

## Colloquium

Jonathan Pritchard  
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Thursday, November 18, 2010

4:30 pm

Doherty Hall A 301D

### **“Constraining the Dawn of Cosmic Structure and the Epoch of Reionization with the 21 cm Line”**

**Abstract:**

The first billion years of the Universe spans the formation of the first galaxies and black holes. Radiation from these sources drives the diffuse matter between galaxies through a major phase transition from a mostly cold and neutral state to one mostly hot and ionized. This period of reionization lies at the edge of modern astrophysics presenting many theoretical and observational challenges. In this talk, I will discuss the prospects for low frequency observation of the redshifted 21 cm line of neutral hydrogen, which may provide the key to developing a detailed understanding of this period. I will describe the theory underlying two aspects of the 21 cm signal from the period of “cosmic dawn”: the global 21 cm signal and 21 cm fluctuations. There is much to be learnt about the first galaxies and reionization from this technique and many challenges and opportunities ahead for the first observations. Along the way I will touch upon some of the prospects for constraining cosmology with these observations.