

# YCAA Seminar

Tuesday, February 16, 2010

2:00 pm

263 JWG

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## *Cosmology with the Lyman-alpha Forest*

### *Abstract:*

Lyman-alpha forest is the forest of absorption features in the quasar spectra blue-ward of quasar's Lyman-alpha emission. These are caused by neutral hydrogen along the line of sight to the quasar. Since neutral hydrogen traces baryons, which in turn trace the distribution of the dark matter, it is possible to use Lyman-alpha forest as a cosmological tool. Its main advantage is that it is a unique probe of high-redshift universe ( $z=2-3$ ) and that quasar lines of sight, in contrast with galaxies, probe random and hence typical parts of the universe, where fluctuations are mildly non-linear and where complicated gas dynamics does not come into play. On the other hand, Lyman-alpha forest observations come with a barrage of their own systematics issues, some of which I will discuss in the talk. BOSS experiment is expected to measure spectra of about 160,000 quasars and I will discuss various pieces of fundamental physics that can be probed with it: dark-energy through baryonic acoustic oscillations, neutrino masses and primordial non-Gaussianities.