

# JOINT TUFTS/MIT COSMOLOGY SEMINAR

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## *Primordial Power Spectrum pre- and post-BICEP*

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An inflationary gravitational wave background consistent with BICEP2 is difficult to reconcile with a simple power-law spectrum of primordial scalar perturbations. Tensor modes contribute to the temperature anisotropies at low multipoles, and this effect - together with a prior on the form of scalar perturbations - was the source of previous bounds on the tensor-to-scalar ratio. In this talk I will present a model independent reconstruction of the primordial power spectrum with Planck data alone as well as in combination with BICEP2. Using Bayesian evidence I will show that Planck data alone favors a simple power-law power spectrum at intermediate to small scales and does not give preference to features on large scales. However, including the recent results from BICEP2, we find weak evidence for a running of the spectral index and strong evidence for a "broken" spectrum. Taken at face-value, the BICEP2 results require two new inflationary parameters in order to describe both the broken scale invariance in the perturbation spectrum and the observed tensor-to-scalar ratio. Finally, I will discuss the constraints on the standard cosmological parameters with different prior assumptions on the primordial power spectrum.

Tuesday, April 8, 2014, 2:30 pm  
Robinson Hall, Room 250  
Tufts University

Refreshments at 2:00 in Knipp Library, Room 251