

Columbia University

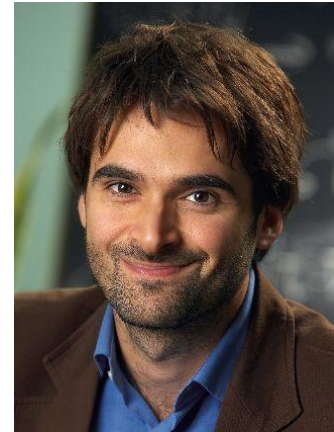
Department of Physics Colloquium



"SYMMETRIES OF THE VERY EARLY UNIVERSE"

Our universe enjoys a lot of symmetries. On the largest scales, the universe is homogeneous and isotropic, consistent with a spatially-flat Friedmann-Robertson-Walker space-time. The density inhomogeneities in the early universe, which later give rise to galaxies and the large scale structure, are the simplest imaginable: their statistics are approximately scale invariant and well-described by a gaussian random field. In this talk, I will describe three broad classes of early universe theories that can account for these observations: single-field inflation, multi-field inflation and the recently-proposed pseudo-conformal universe. I will show that each class is associated with distinct symmetries, which imply subtle constraints on the form of the primordial density correlation functions. These constraints will be tested by ongoing and forthcoming observations of non-Gaussianities in the cosmic microwave background and the large scale structure.

Justin Khoury,
University of Pennsylvania



Monday, October 22, 2012 : 428 Pupin Hall / 4:10 PM