

PHYSICS DEPARTMENT COLLOQUIUM

“Inflationary Cosmology: from Theory to Observation and Back”

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The Hot Big Bang is a remarkably successful picture of the universe, as evidenced by the remarkable precision data of the past decade. However, some problems are unresolved. To explain the large-scale homogeneity, isotropy, and oldness of the universe requires an early inflationary period in which the universe grows superluminally. A particularly attractive feature of inflation is the generation of density perturbations that serve as seeds for galaxy formation. These same perturbations make explicit predictions for the Cosmic Microwave Background anisotropies. Data from the WMAP satellite released on March 17, 2006 rule out a large set of inflationary models as well as confirm the possibilities of others. In this talk, I will review the basic idea of inflation, discuss the theoretical status of various models, and show how current and future data will tell us in detail which model is right.

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