



Séminaire du Laboratoire de l'Accélérateur Linéaire

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IAS

Mardi 25 Février 2014 à 11 :00

Probing fundamental physics with the Cosmic Microwave Background and Large Scale Structures

Despite the remarkable agreement between present data and the standard cosmological Λ CDM model, we are still far from an exhaustive understanding of our Universe. Obtaining a theoretical framework to understand the initial conditions for structure formation and determining the nature of dark matter and dark energy are indeed among the biggest puzzles and challenges in modern physics. In this talk I will present how the Cosmic Microwave Background (CMB) and the Large Scale Structures (LSS) can be used for precision tests to prove and challenge the standard cosmological picture. The talk is divided in two parts. In the first one I will focus on CMB non-Gaussianity, I will explain why it is useful, I will show how it can be used to have insights not only into the physics of the very early Universe but also into its late time evolution, probing both inflationary physics and dark energy. I will show how, with the Planck satellite data, we constrained the CMB non-Gaussianity with an unprecedented precision and what is the theoretical interpretation driven from this analysis. In the second part, I will talk about the nature of the primordial perturbations and how to investigate their properties with the CMB and LSS surveys. In particular I will show the impact of mixed adiabatic and isocurvature/entropy initial conditions on the measurements of the Baryon Acoustic Oscillations (BAO) from surveys like BOSS and Euclid. Finally I will presents forecasts on how combining CMB data from Planck and from an Euclid-type LSS survey can improve the constraints of the cosmological parameters in models beyond the standard Λ CDM picture.

Salle 101 du LAL - Bât. 200, Orsay

Thé et café seront servis 1/4 h avant le séminaire