Jeudi 6 février 2025 à 11h (IAS, bâtiment 121, salle 1-2-3)

First cosmological results with the Dark Energy Spectroscopic Instrument

Pauline Zarrouk (LPNHE)

DESI is the first new generation galaxy survey to take data with the goal to shed light on the mechanism that drives the acceleration of the cosmic expansion. Is this accelerated expansion due to a mysterious dark energy component or is our theory of gravity based on General Relativity incomplete at very large scales?

Last year, the DESI collaboration published its first results using a sample of almost 6 million galaxy spectroscopic redshifts that were collected during the first year of DESI survey (Data Release 1, DR1). We first performed an analysis that exploits the Baryon Acoustic Oscillations, a feature in the galaxy distribution that can be used as a standard ruler to measure cosmic distances and retrace the history of the expansion of the Universe. The results we published last April gave new insights on the nature of dark energy. Last November, we published the results of a second analysis where we analysed the full broadband shape of the galaxy two-point clustering to constrain not only the expansion history of the Universe as the April analysis did but also to constrain the theory of gravity at cosmic scales.

In this seminar, first I will first the DESI survey and data, then I will explain these two analysis techniques and eventually I will present the cosmological implications of our results regarding the nature of dark energy and gravity.