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Seminar of the theory group of APC

Mardi 5 Novembre 2019, 14 :00
APC, 646A - Mondrian
Domaines : gr-qc

Titre : *No-Go theorems for ekpyrosis from string theory, and the swampland*

Orateur : **Kunihito Uzawa**

Résumé : *In this talk, we present whether the new ekpyrotic scenario can be embedded into ten-dimensional supergravity. We use that the scalar potential obtained from flux compactifications of type II supergravity with sources has a universal scaling with respect to the dilaton and the volume mode. Similar to the investigation of inflationary models, we find very strong constraints ruling out ekpyrosis from analyzing the fast-roll conditions. We conclude that flux compactifications tend to provide potentials that are neither too flat and positive (inflation) nor too steep and negative (ekpyrosis). We also discuss the swampland conjecture, which has recently been attracting attention in string theory and gravity theory, relates to the slow-roll condition of inflation. First, we will briefly explain the reason why we focus on the swampland conjecture to investigate the dynamics of inflation. Next, we discuss the behavior of the scalar field describing the evolution of the inflationary scenario from the viewpoint of the swampland conjecture. Finally, we present the implications of energy conditions on cosmological compactification solutions of the higher-dimensional Einstein field equations, and show the relation between the slow-roll condition in the inflationary scenario and the swampland criterion.*