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Theory confronts Observations: Cosmology in the era of the Swampland

Monday 25 May 2020 14:50 (25 minutes)

It is well-known that accelerating spacetimes form the basis of our understanding of early and late-time cosmology. On the other hand, there has been a pile of mounting evidence, mainly based on numerous results from String Theory (but not limited to them), that de Sitter space is difficult to embed in a quantum theory of gravity. Thus, these theoretical constraints that any consistent effective field theory must satisfy in order to have a UV-completion – the so-called "Swampland conjectures" – form a new challenge for phenomenologically viable model-building in cosmology. In this talk, I shall discuss some aspects of these conjectures, evidence in support of them and how to reconcile them with astronomical observations with a special focus on inflation. The importance of non-perturbative quantum corrections in constructing quasi de-Sitter backgrounds shall also be demonstrated.

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