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String Theory in Greater Paris

Rencontres Théoriciennes

“Supergravité, théorie des cordes et théorie M”

Jeudi 14 Avril 2016, 11:45

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Geometrical destabilization of heavy scalar fields during inflation

We show the existence of a general mechanism by which heavy scalar fields can be destabilized during inflation. It relies on the fact that the effective mass of fluctuations orthogonal to the inflationary direction contains a contribution proportional to the curvature tensor of the field space metric, and that it can render the entropic fluctuations tachyonic. We describe a simple and rather universal setup in which apparently benign higher-order operators trigger this instability. This phenomenon can prematurely end inflation and have important observational consequences, sometimes excluding models that would otherwise perfectly fit the data. More generally, it modifies the interpretation of cosmological constraints in terms of fundamental physics.

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