



Contribution ID: 66

Type: **not specified**

The Chaotic Regime of D-Term Inflation

Wednesday 24 September 2014 15:20 (20 minutes)

In this talk, I discuss how a period of ‘chaotic inflation’ with a sizeable tensor-to-scalar ratio naturally arises from the decay of a false vacuum of GUT-scale energy. We consider D-term inflation for small couplings of the inflaton to matter fields. Standard hybrid inflation then ends at a critical value of the inflaton field that exceeds the Planck mass. During the subsequent waterfall transition the inflaton continues its slow-roll motion, whereas the waterfall field rapidly grows by quantum fluctuations. Beyond the decoherence time, the waterfall field becomes classical and approaches a time-dependent minimum, which is determined by the value of the inflaton field and the self-interaction of the waterfall field. During this final stage of inflation, the effective inflaton potential is essentially quadratic, which leads to the standard predictions of chaotic inflation.

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Session Classification: Cosmology & Astroparticle Physics B