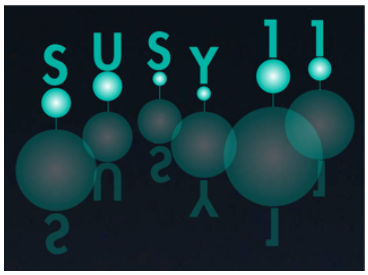

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Catastrophic Inflation

Wednesday, 31 August 2011 14:20 (20 minutes)

We study inflection point inflation using Singularity Theory, which relates degenerate critical points of functions to their local behavior. This approach illuminates universal features of small-field models and gives analytic control over parametrized families of scalar potentials near inflationary solutions. The behavior of the scalar potential is tied to the number of physical input parameters, which determines a set of universality classes. Within these classes, we obtain universal scaling relations for density perturbations and the scale of inflation. In specific models, we show that the scale of supersymmetry breaking also possesses scaling behavior. We illustrate this general structure with a specific example: the Racetrack Inflation model in type IIB string theory, with the inflaton being the real part of the K\"ahler modulus, and the input parameters being flux dependent quantities that appear in the 4D, N=1 superpotential.

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