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Hybrid inflation and waterfall field in string theory from D7-branes

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In this talk, I will present an explicit string realisation of a cosmological inflationary scenario within the framework of type IIB flux compactifications in the presence of three magnetised D7-brane stacks. Inflation takes place around a metastable de Sitter vacuum. The scalar potential of the inflaton, identified with the volume modulus, exhibits a very shallow minimum. Inflation ends due to the presence of "waterfall" fields that drive the evolution of the Universe from a nearby saddle point towards a global minimum with tuneable vacuum energy describing the present state of our Universe. Such implementation of hybrid inflation, explained in detail in a toroidal orbifold case, is generic to models where the inflaton is identified with a Kähler modulus and does not necessarily restrict to our particular setup.

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