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Challenges for Large-Field Inflation and Moduli Stabilization

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We analyze the interplay between Kahler moduli stabilization and chaotic inflation in supergravity. While heavy moduli decouple from inflation in the supersymmetric limit, supersymmetry breaking generically introduces non-decoupling effects. These lead to inflation driven by a bilinear soft mass term. This scenario needs no stabilizer field, but the stability of moduli during inflation imposes a large supersymmetry breaking scale, m_{3/2} » H, and a careful choice of initial conditions. This is illustrated in three prominent examples of moduli stabilization: KKLT stabilization, Kahler Uplifting, and the Large Volume Scenario. Remarkably, all models have a universal effective inflaton potential which is flattened compared to quadratic inflation. Hence, they share universal predictions for the CMB observables, in particular a lower bound on the tensor-to-scalar ratio, r > 0.05.

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