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Dynamically Induced Planck Scale and Inflation

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Theories where the Planck scale is dynamically generated from dimensionless interactions provide predictive inflationary potentials and super-Planckian field variations. We first study the minimal single-field realisation in the low-energy effective field theory limit, finding the predictions $n_s \approx 0.96$ for the spectral index and $r \approx 0.13$ for the tensor-to-scalar ratio, which can be reduced down to ≈ 0.04 in presence of large couplings. Next we consider agravity as a dimensionless quantum gravity theory finding a multi-field inflation that converges towards an attractor trajectory that predicts $n_s \approx 0.96$ and $0.003<r<0.13$, interpolating between the quadratic and Starobinsky inflation. These theories relate the smallness of the weak scale to the smallness of inflationary perturbations: both arise naturally because of small couplings, implying a reheating temperature of 10^{7-9} GeV. A measurement of r by Keck/Bicep3 would give us information on quantum gravity in the dimensionless scenario.

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