

# Cosmic inflation without inflaton

## INFLATIONARY PREDICTIONS

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# ABSTRACT

We argue that the presence of an inflationary epoch is a natural, almost unavoidable, consequence of the existence of a sensible effective action involving an infinite tower of higher-curvature corrections to the Einstein-Hilbert action with the following features:

- i) Its vacuum spectrum solely consists of a graviton and is ghost-free [Bueno & Cano arXiv:1607.06463].
- ii) It has Schwarzschild-like black hole solutions [Bueno & Cano arXiv:1610.08019].
- iii) Its cosmology is well-posed as an initial value problem [Arciniega et al arXiv:1810.08166, 1812.11187].
- iv) It can provide a **late-time cosmology** arbitrarily close to  $\Lambda$ CDM while, at the same time, giving an **inflationary period** in the early universe with a **graceful exit**. [Arciniega et al arXiv:1810.08166, 1812.11187]
- v) Inflationary predictions are **within the constraints** obtained by Planck [Arciniega et al arXiv:2001.11094].

# GEOMETRIC INFLATION

## Generalized Friedmann equations

$$3F(H) = 8\pi G\rho + \Lambda$$

$$-\frac{\dot{H}}{H} F'(H) = 8\pi G(\rho + P)$$

$$\text{where } F(H) \equiv H^2 + L^{-2} \sum_{n=3}^{\infty} (-1)^n \lambda_n (LH)^{2n},$$

$$\text{and } F'(H) \equiv dF(H)/dH.$$

