



Canadian Association
of Physicists

Association canadienne
des physiciens et physiciennes

Contribution ID: 2669

Type: **Oral (Non-Student) / Orale (non-étudiant(e))**

Geometric Inflation

Tuesday, June 4, 2019 2:30 PM (15 minutes)

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. No additional fields besides the metric are required. We show that a family of such corrections giving rise to a well-posed cosmological evolution exists and automatically replaces the radiation-dominated early-universe Big Bang by a singularity-free period of exponential growth of the scale factor, which is gracefully connected with standard late-time Λ CDM cosmology. The class of higher-curvature theories giving rise to sensible cosmological evolution share additional remarkable properties such as the existence of Schwarzschild-like non-hairy black holes, or the fact that, just like for Einstein gravity, the only degrees of freedom propagated on the vacuum are those of the standard graviton.

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Session Classification: T3-9 Cosmology (DTP) | Cosmologie (DPT)

Track Classification: Theoretical Physics / Physique théorique (DTP-DPT)