

String Theory and the First Half of the Universe

Thursday, 27 June 2024 14:30 (15 minutes)

We perform a detailed study of stringy moduli-driven cosmologies between the end of inflation and the commencement of the Hot Big Bang, including both the background and cosmological perturbations: a period that can cover half the lifetime of the universe on a logarithmic scale. Compared to the standard cosmology, stringy cosmologies motivate extended kination, tracker and moduli-dominated epochs involving significantly trans-Planckian field excursions. Conventional effective field theory is unable to control Planck-suppressed operators and so such epochs require a stringy completion for a consistent analysis. Perturbation growth in these stringy cosmologies is substantially enhanced compared to conventional cosmological histories. The trans-Planckian field evolution results in radical changes to Standard Model couplings during this history and we outline potential applications to baryogenesis, dark matter and gravitational wave production.

Presenter: APERS, Fien

Session Classification: Parallel session