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Constraining the inflationary field content

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Understanding the laws of inflation can shed light on the processes that govern physics at very high energy scales, beyond current experimental limits. In particular, the characterisation and detection of primordial gravitational waves produced during inflation can be an excellent test for the particle content of the very early universe. We consider an Effective Field Theory of inflation where tensor perturbations are sourced already at linear order. We show how this set-up supports a sufficient production of primordial gravitational waves to make the signal detectable at interferometer scales. We complement theoretical consistency checks on the model with stringent observational bounds on its parameter space stemming from CMB measurements, LIGO and Big Bang Nucleosynthesis bounds, as well as constraints from Primordial Black Holes production and UltraCompact MiniHalos.

Author: IACCONI, Laura (ICG, University of Portsmouth)

Presenter: IACCONI, Laura (ICG, University of Portsmouth)

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