

Gravitational Geometry and Dynamics Group Seminar

Wed., Feb. 21st, 2024, at 11h00.

Room: 11.2.21 and Zoom ID: 989 6252 0928

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From Hubble to Bubble - gravitational waves from phase transitions after inflation

The prospect of a stochastic gravitational wave (GW) background from the primordial universe offers a promising new window for cosmology and fundamental physics. Studying the GW signals from cosmological phase transitions can illuminate aspects of Beyond the Standard Model (BSM) physics and allow us to probe the early universe via a new perspective. In this study (2309.08530), we investigated minimal scalar BSM extensions, with respect to the evolution of the scalar potential at the end of inflation. More specifically, we focused on the transition from the typical potential-dominated de Sitter epoch to the kinetic dominated period dubbed kination. In this setting, a strong first-order phase transition can take place because of the scalar field's decreasing potential barrier due to its non-minimally coupling to gravity. Therefore, a characteristic GW spectrum can be produced from the collision of true-vacuum bubbles. With this prescription, we propose a new triggering mechanism for BSM phase transitions that could produce potentially observable GW signatures with the future detectors.