International Joint Workshop on the Standard Model and Beyond 2024 & 3rd Gordon Godfrey Workshop on Astroparticle Physics

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Type: Invited Talk

Consequences of phase transitions occurred during inflation

Thursday 12 December 2024 11:00 (30 minutes)

In slow-roll inflationary models, the inflaton can undergo excursions on the order of the Planck scale, leading to significant changes in the properties of fields coupled to the inflaton, referred to as spectator fields. These changes may result in transitions between weakly and strongly interacting regimes, or even alterations in mass squared within the spectator field sector during inflation. Such dynamics can induce phase transitions, which have profound implications for the early Universe. In this talk, I will explore the phenomenological consequences of these phase transitions, focusing on the production of gravitational waves, curvature perturbations, non-Gaussianities, dark matter, and baryon number. I will also demonstrate how gravitational waves generated by scalar perturbations induced by phase transitions may potentially explain the alleged gravitational wave signals observed in recent pulsar timing array studies.

Presenter: AN, Haipeng

Session Classification: Plenary