

Whispers from the Dark Universe - Particles & Fields in the Gravitational Wave Era

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WHISPERS FROM THE DARK UNIVERSE - PARTICLES & FIELDS IN THE GRAVITATIONAL WAVE ERA

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Stochastic Gravitational Waves and Higgs Stability via Non-Minimal Curvature Couplings

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A non-minimal interaction between the Standard-Model Higgs and spacetime curvature offers a fascinating connection between the physics of post-inflationary reheating and the parameters of the Standard Model. Such an interaction helps stabilising the Higgs at high energies, avoiding the problem of vacuum stability during inflation. It also leads to the explosive tachyonic production of Higgs particles during a post-inflationary phase of kinetic-energy domination due to a change in sign of the Ricci scalar. In this talk, I will discuss the stochastic gravitational wave background produced in a so-called Hubble-induced phase transition which can be investigated via semi-analytical computations and fully-fledged lattice simulations. By exploring a wide range of model parameters, it is possible to reconnect the characteristics of the gravitational-wave signal to the scale of the phase transition, the strength of the non-minimal interaction and the running of the Higgs self-coupling, thus opening a new window into the Higgs effective potential at high scales.

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