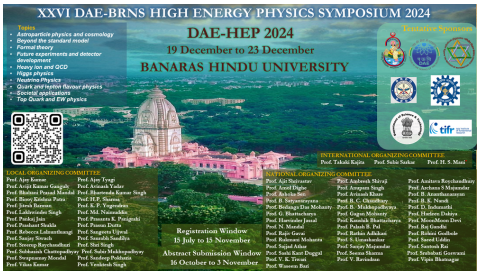

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Phase Transition-Driven Leptogenesis via a Dynamically Evolving Vacuum

A phase transition in the early Universe, at a critical temperature T_*, induces a temperature dependent mass for right handed neutrinos (RHNs) that eventually stabilizes to a constant value through the Higgs vacuum expectation value (vev) after electroweak symmetry breaking (EWSB). This dynamical variation in the mass of RHNs with temperature enables us to achieve RHN mass below the electroweak scale ($\sim$ 100 GeV) at zero temperature while generating a sufficient amount of lepton asymmetry near T_*, which, through the sphaleron process, can account for the observed baryon asymmetry of the Universe (BAU). Therefore, such a low mass of RHNs at zero temperature enhances its detection probability. Notably, this framework also has the potential to predict a primordial lepton asymmetry generated after EWSB, as hinted by measurements of helium abundance, shedding light on a potential link to the early phase of leptogenesis.

Field of contribution

Phenomenology

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