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Type: **Talk**

Strong first-order electroweak phase transition in selected extended scalar sector models

Sunday, November 27, 2022 11:30 AM (15 minutes)

To explain the observed baryon asymmetry of the universe (BAU) in an electroweak baryogenesis (EWBG) scenario, beyond the standard model (BSM) models are required to fulfill the necessary Sakharov conditions, i.e. they need to provide sufficient departure from thermal equilibrium by enabling a strong first-order electroweak phase transition (SFOEWPT), as well as provide a source of additional CP violation.

Using the C++ code BSMPT, we investigate the allowed parameter space of BSM models for providing an SFOEWPT by minimizing the one-loop daisy-resummed finite temperature effective potential and taking into account all relevant theoretical and experimental constraints.

This talk focuses on two recent directions of our work: First, the study of the interplay between an SFOEWPT and Higgs pair production in a 2HDM-EFT. Second, the promising model 'CP in the Dark' which provides a dark sector with a dark matter (DM) candidate and additional explicit CP violation in the dark sector. For 'CP in the Dark', we find valid SFOEWPT points that offer additional spontaneous CP violation at finite temperature and lie within the reach of XENON1T and future invisible Higgs decay searches for DM.

Category

Particle / Astroparticle / Cosmology (Theory)

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