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Probing Leptogenesis with the Cosmological Collider

Wednesday, November 9, 2022 7:00 PM (1h 20m)

In this talk I will first review the recent development and opportunities addressing the profound puzzle of matter-antimatter asymmetry in our Universe, as a general motivation. Then I will introduce a cosmological probe for a compelling solution to the puzzle, leptogenesis, which is generally challenging to directly test due to the very high energy scales involved. In particular, we propose a new probe for leptogenesis with cosmological collider physics. With the example of a cosmological Higgs collider, we demonstrate that during inflation leptogenesis models can produce detectable primordial non-Gaussianity with distinctive oscillatory patterns that encode information about the lepton-number violating couplings, the Majorana right-hand neutrino masses, and the CP phases, which are essential to leptogenesis. The detection prospect with upcoming astrophysical observations will also be discussed.

Presenter: CUI, Yanou (University of California, Riverside)