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Freeze-in Cogenesis of Asymmetric Dark Matter

Thursday 16 May 2024 15:00 (15 minutes)

Most scenarios of Majorana Leptogenesis require on-shell production of heavy Majorana neutrinos, N whose CP-violating decays give rise to a lepton asymmetry. This lepton asymmetry is then converted into the observed baryon asymmetry by sphalerons. In this talk, I will discuss the possibility of simultaneously generating dark and Standard Model lepton asymmetries when the universe reheats to a temperature $T_{\text{RH}} \ll m_N$. Since the universe does not reach sufficiently large temperatures to produce N on-shell, the dark and visible asymmetries are frozen-in via N mediated scattering processes. I discuss dark sector thermalization, lepton number violation and transfer, and how CP can be violated by these scattering process. In particular, I point out how the interplay between wash-out processes and thermalization between the dark and visible sectors allows for the asymmetric dark matter abundance to be suppressed relative to the lepton asymmetry. This suppression gives rise to dark matter masses that can be much larger than the usual GeV-scale found most models of asymmetric dark matter.

Mini Symposia (Invited Talks Only)

Plenary (Invited talks only)

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