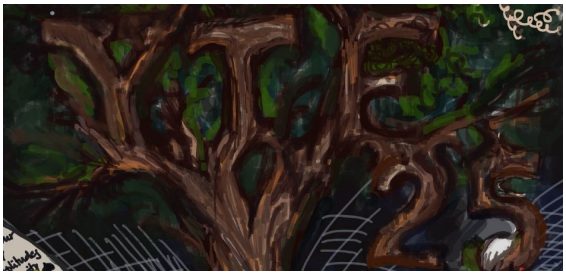

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Linking Leptogenesis and Asymmetric Dark Matter

Thursday 18 December 2025 09:10 (30 minutes)

We investigate a minimal extension of the Leptogenesis framework that simultaneously explains the observed baryon asymmetry and dark matter (DM) abundance through the decay of a heavy Majorana neutrino. In this scenario, CP violation arises from complex Yukawa couplings, enabling the generation of asymmetries in both the Standard Model (SM) and DM sectors. We explore two regimes: (i) wash-in, where an initial dark asymmetry is transferred to SM leptons by $2 \leftrightarrow 2$ scattering processes; and (ii) co-genesis, featuring a hierarchical coupling structure that allows enhanced CP violation while supporting a low-scale seesaw mechanism at order $\mathcal{O}(2)$ TeV. This setup not only links light neutrino masses to the Majorana mass term but also suggests that lepton-number violation may occur at experimentally accessible energy scales. In the co-genesis scenario, we show spin-independent cross sections for DM heavier than 10 GeV that can be tested in current direct detection experiments and motivate the exploration of cross sections inside the neutrino fog for lighter DM masses.

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