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Cosmological Production of ROMP Dark Matter

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Rapidly Oscillating Massive Particles (ROMPs) arise in quantum systems with non-diagonal interaction Hamiltonians. This misalignment between flavor and mass eigenstates leads to oscillations between flavor states, such as those between electron and muon neutrinos in the Standard Model, or between active and sterile neutrinos in Beyond the Standard Model frameworks to name just a few examples. In this talk, I will discuss the general framework for particle production of dark matter via mixing, showing how oscillations, scatterings, thermal masses, and resonances all play a role to give ROMPs a rich cosmology.

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