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The cosmic lepton asymmetry and neutrino flavor transformation

Sunday, 25 June 2017 14:00 (15 minutes)

A cosmic lepton asymmetry much larger than its baryonic counterpart is a prerequisite for the resonant production of sterile neutrino dark matter and is associated with a number of baryogenesis mechanisms. Incidentally, a lepton asymmetry can also dramatically affect the flavor transformation of the active neutrinos in the early universe. I will explain how a lepton asymmetry renders the problem of neutrino flavor evolution into a subtle, nonlinear one, and I will present results on the various regimes of flavor transformation that emerge. Many of these flavor phenomena occur prior to or during neutrino decoupling and therefore may leave signatures in the primordial nuclide abundances. I will report briefly on an ongoing program to gauge the impact of this neutrino physics on cosmological observables.

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