



Tuesday, May 26, 4:15pm | PAB 4-708 | Zoom: 517 486 4983

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## Maximal parameter space of sterile neutrino dark matter with lepton asymmetries

We delineate the maximal parameter space of sterile neutrino dark matter in the presence of lepton flavor asymmetries. We focus on large flavor asymmetries with vanishing total lepton asymmetry, which are washed out by neutrino oscillations at MeV temperatures and hence are consistent with BBN and CMB constraints. We derive a semi-classical Boltzmann equation for sterile neutrinos applicable in this regime and validate it against quantum kinetic equations. For sterile neutrino masses up to 60 keV, the viable range of mixing angles extends by up to two orders of magnitude, with broad prospects for tests in forthcoming X-ray, CMB, and structure formation observations. We will also discuss some related topics: the origin of lepton flavor asymmetries and baryon asymmetry, and so on.