

Shaikh Saad: Beyond Neutrino Mass: Observable $n-\bar{n}$ Oscillations in UV Complete Seesaw Models

Wednesday 29 October 2025 10:00 (35 minutes)

Next-generation experiments like DUNE and NNBAR will greatly enhance sensitivity to neutron–antineutron oscillations, a direct probe of baryon number violation ($\Delta B = 2$) beyond the Standard Model. This talk discusses such oscillations in unified frameworks that also explain fermion and neutrino masses via seesaw mechanisms. Two scenarios will be discussed: (1) Type II seesaw with two color-sextet scalars, realizable in $SO(10)$ /Pati–Salam models, and (2) Type III seesaw with a sextet scalar and color-octet fermion, naturally embedded in $SU(5)$. In both cases, the same dynamics linking fermion masses induces baryon violation, tying oscillations to flavor structure. Upcoming searches can probe new colored states up to 10^{11} GeV—far beyond collider reach—making $n-\bar{n}$ oscillations a rare low-energy window into grand unification and ultra-heavy new physics.