



NEW PROSPECTS FOR PROCESSES THAT BREAK BARYON NUMBER BY TWO UNITS AND THEIR IMPLICATIONS

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The Typically searches for processes that break baryon number have been those for neutron-antineutron oscillations, which would break baryon number \mathbf{B} by two units, or for nucleon decays in which $\Delta\mathbf{B}=1$. Recently we have suggested that $\Delta\mathbf{B}=2$ processes could also be mediated through scattering, *i.e.*, through $n \rightarrow n\bar{n}$ "conversion." In this talk I will discuss the broad motivation for such searches, considering particularly their links to the physics of Majorana neutrinos. That the neutrino is its own antiparticle, *i.e.*, that it is Majorana, can be established through the observation of neutrinoless double beta decay, which breaks lepton number \mathbf{L} by two units, though its mechanism need not be that of light Majorana neutrino exchange between two decaying nucleons. Indeed, the would-be observation of baryon number violation relates to other, short-range mechanisms of neutrinoless beta decay, in which the needed new physics also emerges at much lower energy scales than that associated with a light Majorana neutrino.

Tuesday, October 2nd, 2018

4:00 pm

Roger W. Finlay Conference Room

Coffee and Cookies at 3:50 pm