

Is neutrino its own antiparticle?

Monday 4 February 2019 17:50 (30 minutes)

The mass and nature of neutrinos play an important role in theories beyond the standard model. It is now well established that neutrinos have a non-zero mass, but whether the neutrino and anti-neutrino are the same (Majorana particle) or distinct (Dirac particle) is still an open question. At present, neutrinoless double beta decay (NDBD or $0\nu\beta\beta$), is perhaps the only experiment which can provide an answer to this key question. The normal double beta decay ($2\nu\beta\beta$) process has been experimentally observed in 13 nuclei so far with a half-life in the range $\sim 10^{18}$ to 10^{24} yr. The $0\nu\beta\beta$ decay violates conservation of lepton number and has implication in understanding the matter-antimatter asymmetry in the universe. Further, the nuclear β decay and double beta decay can provide the information on absolute effective mass of the neutrinos. Given the significance of the NDBD, there is a widespread interest worldwide employing a variety of novel techniques. This talk will give a brief overview of ongoing as well as proposed NDBD experiments, with an emphasis on challenges involved in these experiments. This talk will highlight various R&D aspects of the TIN:TIN (The India-based Tin Detector) to search for $0\nu\beta\beta$ in ^{124}Sn .

Primary author: Prof. VANDANA NANAL (TIFR)

Presenter: Prof. VANDANA NANAL (TIFR)

Session Classification: Plenary Session VI