

Physics Colloquium

Tuesday, November 19, 2019, 3:30PM in SC 10

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The Search for Neutrinoless Double Beta Decay

Detection of neutrinoless double beta decay is the only known experimentally viable way to test for the possible Majorana nature of the neutrino. Observation of this decay, which may have a half-life in excess of 10^{27} years, would have existential implications: illuminating a possible explanation for the dominance of matter over antimatter in the Universe, making a definitive connection between standard model particles and ultra-high-scale physics, and demonstrating conclusively that lepton number is not a conserved quantity in nature. I will discuss the ongoing quest to detect neutrinoless double beta decay, with a focus on the NEXT program. NEXT plans to use high pressure xenon gas, eventually augmented with single molecule fluorescent imaging barium ion sensors, to extend experimental sensitivity to neutrinoless double beta decay into unprecedented new regimes.

Refreshments at 3:00PM in SC 103