NPA Seminar

Wright Laboratory

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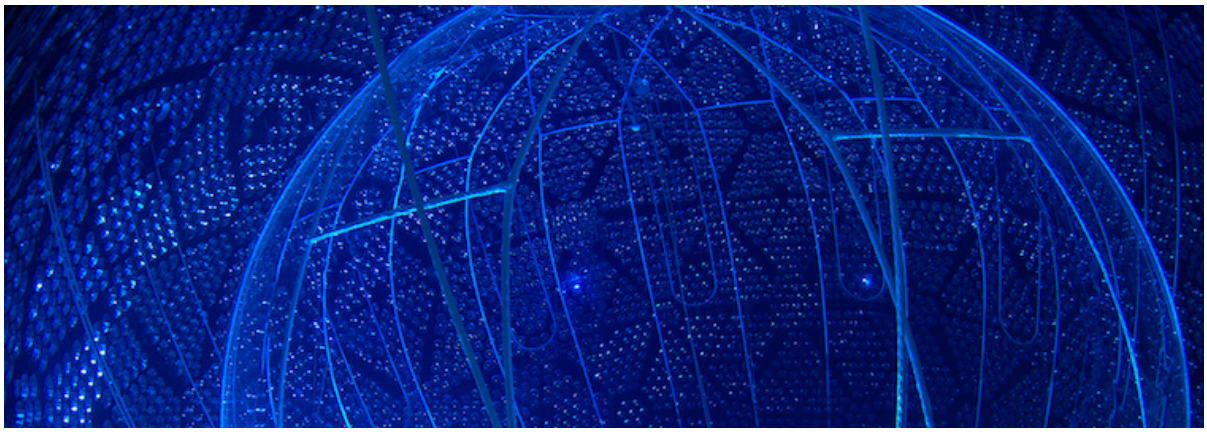
April 6, 2023 at 1:00 pm in WL-216

Neutrinoless Double Beta Decay and the SNO+ Experiment



One of the biggest questions in fundamental particle physics is whether neutrinos are Dirac fermions, with distinct anti-particles, or Majorana fermions, for which the particles and anti-particles are identical. The best available probe of the neutrino nature is neutrinoless double beta decay ($0\nu\beta\beta$), a hypothetical process that require massive Majorana neutrinos. This discovery of this lepton number violating process would therefore reveal the neutrino nature and provide a window into physics beyond the Standard Model.

SNO+ is a kilo-tonne scale low background neutrino detector with the primary goal of searching for $0\nu\beta\beta$ in tellurium-130. The experiment's target volume is currently filled with liquid scintillator, providing the scope for background characterisation as well as measurement of reactor, geo, and low-energy solar neutrinos. The scintillator will be loaded with natural tellurium in order to search for $0\nu\beta\beta$. In this seminar, I will give an overview of the SNO+ experiment and explain the strategies SNO+ will employ in its $0\nu\beta\beta$ search.

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