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Nucleon Decay and Neutrino Detectors

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## NuDoubt++: Combining Hybrid and Opaque Scintillation Technology in the Search for Positive Double Weak Decays

Thursday, October 2, 2025 5:00 PM (25 minutes)

Double beta plus decay is a rare nuclear disintegration process. Difficulties in its measurement arise from suppressed decay probabilities, experimentally challenging decay signatures and low natural abundances of suitable candidate nuclei.

In this context, we present NuDoubt++, a new detector concept to overcome these challenges. It is based on the first-time combination of hybrid and opaque scintillation detector technology paired with novel light read-out techniques. This approach is particularly suitable detecting positron (beta plus) signatures. We expect to measure two-neutrino double beta plus decay modes in less than two years of operation. Moreover, we are able to probe neutrinoless double beta plus decays at several orders of magnitude improved significance compared to current experimental limits.

In this presentation, we will detail our detector concept and highlight our current R&D progress.

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