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## The RES-NOVA observatory

*Thursday, June 26, 2025 2:15 PM (30 minutes)*

The RES-NOVA project detects cosmic neutrinos via coherent elastic neutrino-nucleus scattering (CEvNS) using archaeological Pb-containing PbWO<sub>4</sub> cryogenic detectors. RES-NOVA plans to conduct a direct detection campaign while waiting for neutrinos of astrophysical origin. The natural abundance of Pb-207 offers sensitivity to spin-dependent dark matter interactions. Additionally, Effective Field Operators offer a comprehensive way to interpret experimental data for the search of the elusive dark matter particles. Most of these operators feature spin proportionality and, hence, knowledge of the nuclear spin structure is key for accurate model evaluation. Thanks to one existing calculation of the Pb-207 spin structure allowed RES-NOVA to accurately compute sensitivity predictions to spin dependent DM particles interactions in the light of the SUSY neutralino dark matter candidate.

The target material contains tungsten, an interesting candidate to search for double electron capture in W-180 and W-186, a key process to search for exotic properties of neutrinos. A precise evaluation of the nuclear matrix elements is crucial to translate experimental data to the life time of these isotopes.

In this contribution the experimental reach of RES-NOVA will be outlined with emphasis on how the knowledge of key nuclear structures impacts the precision of the planned results.

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