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ReActor neutrino Liquid xenon Coherent Scattering (RELICS) experiment

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The neutrino-nucleus coherent scattering (CEvNS), as a low-energy channel of neutrino neutral current, was predicted right after the discovery of W, Z bosons. Not until its detection in 2017 using the high-energy neutrino flux from a neutron spallation source, CEvNS had been evading detection due to its very low energy deposition. CEvNS has the highest cross-section among all interaction channels for MeV neutrinos which come from nuclear reactions, making it the most promising way of remote monitoring and detection of nuclear reactors. The biggest challenges are how to lower the energy threshold to keV and sub-keV, and how to mitigate/identify the cosmogenic background in a sea-level detector. Liquid xenon time projection chamber (TPC), because of its excellent performance in the direct search of dark matter particles, is a promising detector technique for the reactor CEvNS search. In this talk, I will introduce the RELICS experiment which aims at reactor CEvNS detection for the first time using liquid xenon TPC.

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