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TALK: Detection of cosmogenic (B)SM signals with nuclear inelastic scattering

Monday, July 1, 2024 10:00 AM (45 minutes)

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I will discuss the detection of sub-GeV-range cosmogenic signals at large-volume neutrino detectors such as DUNE, SK/HY, and JUNO, utilizing nuclear inelastic scattering channels featuring nuclear deexcitation gamma-ray lines. I will first briefly discuss the detection of neutrino signals and point out the potential of observing the 13-MeV oxygen line at SK. I will then propose a new approach to search for light dark matter (DM) in the range of keV-GeV in the context of cosmic-ray boosted dark matter. I will show that using a hadrophilic dark-gauge-boson-portal model as a benchmark, the nuclear inelastic channels generally provide better sensitivity than the elastic scattering for a large region of light DM parameter space.

Presenter: KIM, Doojin (Texas A&M University)