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Unleashing the Power of EFT in Neutrino–Nucleus Scattering

Tuesday 14 May 2024 16:00 (15 minutes)

Neutrino physics is advancing into a precision era with the construction of new experiments, particularly in the few GeV energy range. Within this energy range, neutrinos exhibit diverse interactions with nucleons and nuclei. In this talk I will delve in particular into neutrino–nucleus quasi-elastic cross sections, taking into account both standard and, for the first time, non-standard interactions, all within the framework of effective field theory (EFT). The main uncertainties in these cross sections stem from uncertainties in the nucleon-level form factors, and from the approximations necessary to solve the nuclear many-body problem. I will explain how these uncertainties influence the potential of neutrino experiments to probe new physics introduced by left-handed, right-handed, scalar, pseudoscalar, and tensor interactions. For some of these interactions the cross section is enhanced, making long-baseline experiments an excellent place to search for them.

Mini Symposia (Invited Talks Only)

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