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Lattice QCD and Nuclear Physics for BSM searches

Monday, 23 July 2018 10:00 (30 minutes)

Low-energy tests of fundamental symmetries are extremely sensitive probes of physics beyond the Standard Model (SM), reaching scales that are comparable, if not higher, than directly accessible at the energy frontier. The interpretation of low-energy precision experiments and their connection with models of BSM physics relies on controlling the theoretical uncertainties induced by the non-perturbative nature of QCD at low energy and of the nuclear interactions.

In this talk I will discuss how the interplay of Lattice QCD and nuclear Effective Field Theories can lead to improved predictions for low-energy experiments, with controlled uncertainties.
I will review recent progress in the calculation of the nucleon electric dipole moment (EDM) and of time-reversal-violating pion-nucleon couplings, and the implications for nuclear EDM experiments.
I will then discuss open problems in the theory of neutrinoless double beta decay, and the important role that lattice QCD calculations in the two-nucleon sector can play to resolve these issues.

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