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Progress on the nucleon EDM in lattice QCD

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EDM of the nucleon, whether observed or further constrained, can be traced back to various CP-violating quark and gluon effective interactions. In order to constrain these effective interactions and, subsequently, the extensions of the Standard Model, nonperturbative calculations of nucleon structure are necessary. Low-energy theories and nucleon models provide ballpark estimates for the nEDM sensitivity to CP violation at the quark/gluon level, while precise and model-independent relations between nEDM and various sources of CP violation are expected from QCD calculations on a lattice. Lattice QCD has reached a respectable level of statistical and systematic precision for hadron spectrum and simple nucleon structure observables with physical quark masses, and on the verge of producing reliable results for nucleon EDM induced by lowest-order quark-gluon operators. In this talk, I will briefly overview the current status of these calculations as well as show some recent preliminary results.

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