

Abstract for an Invited Paper
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Dissertation Award in Nuclear Physics Lecture: T violation in nuclear systems. An effective approach

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The observation of the electric dipole moment (EDM) of the neutron, proton or deuteron in the next generation of experiments will be a clear signal of new physics, originating at scales comparable to those probed at the LHC. I will discuss how the formalism of Effective Field Theories, in particular Chiral Perturbation Theory, can be a powerful tool to follow the clues from EDM experiments back to the dominant mechanism(s) of time-reversal (T) violation at high energy. I will consider the lowest-dimension P- and T-violating operators that can be added to the QCD Lagrangian, the dimension four QCD theta term and several dimension six operators. I will construct the low-energy interactions between pions, nucleons and photons stemming from each fundamental source and discuss the implications for the EDMs of light nuclei. I will show how the different properties under chiral symmetry of the microscopic sources result in qualitative different relations between the EDMs of one, two and three nucleon systems.