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PGCM calculations with chiral EFT interactions

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The Projected Generator Coordinate Method (PGCM) is a powerful and versatile many-body method that has been used for decades to study low-energy nuclear structure. In particular, the PGCM is particularly well suited to describe collective nuclear phenomena such as deformation or pairing. Also, a great strength of the method is the proper treatment of quantum numbers associated with the symmetries of the Hamiltonian that permits the unambiguous evaluation of the principal observables of interest in nuclear spectroscopy (spin and parity, electric quadrupole and magnetic dipole moments, reduced transition probabilities, ...). In the past, PGCM calculations have been mostly performed using phenomenological representations of the nuclear Hamiltonian. In recent years, however, we also developed numerical tools to perform advanced PGCM calculations based on microscopic Hamiltonians derived from chiral effective field theory. In this presentation, I will discuss the progress to anchor the PGCM in an ab initio philosophy and show recent results concerning nuclear structure and related areas.

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