Objectives

- Predict properties of ground and excited states of light nuclei with robust theoretical error estimates.
- Test consistent LENPIChiral effective field theory (EFT) interactions with 2- and 3-nucleon forces.
-Extend and test a Bayesian statistical model that learns from the order-by-order EFT convergence pattern to account for correlated excitations.
- First test of novel chiral nucleon-nucleon potentials with consistent three-nucleon forces.
- Demonstrates understanding of theoretical uncertainties due to chiral EFT expansion.
- Accounting for correlations produces agreement with experimental excitation energies (see figure).
- Exceptions in $^{12}$C and $^{12}$B indicate different theoretical correlations in the nuclear structure.

Impact

Accomplishments