- Nuclear structure such as low-lying level schemes and transition probabilities are key inputs to reaction theory
- Current nuclear theories are too limited
  - Ab initio methods do not scale well (NCSM, GFMC) or are not precise enough yet (CC, IMSRG)
  - Shell model is very accurate and very precise but too local: predictive power is constrained
  - Current implementations of nuclear density functional theory (DFT) do not provide quantum numbers and are imprecise

We need to build theoretical capabilities for spectroscopic-quality theories of nuclear properties across the entire mass table in support of FRIB experimental programs

- Density functional theory (DFT) provides a global framework to do so but current implementation is too limited
  - Energy functionals must be Hamiltonian-based and anchored on chiral EFT potentials
  - Complete MR-EDF framework must be implemented: projection and configuration mixing
  - Theoretical uncertainties must be quantified
- Progress requires
  - Investing in codes that leverage HPC facilities and ML/AI methods
  - Educating next generation of nuclear theorists