

Lawrence Livermore National Laboratory

**SciDAC Reaction Theory
Year-5-End plans**

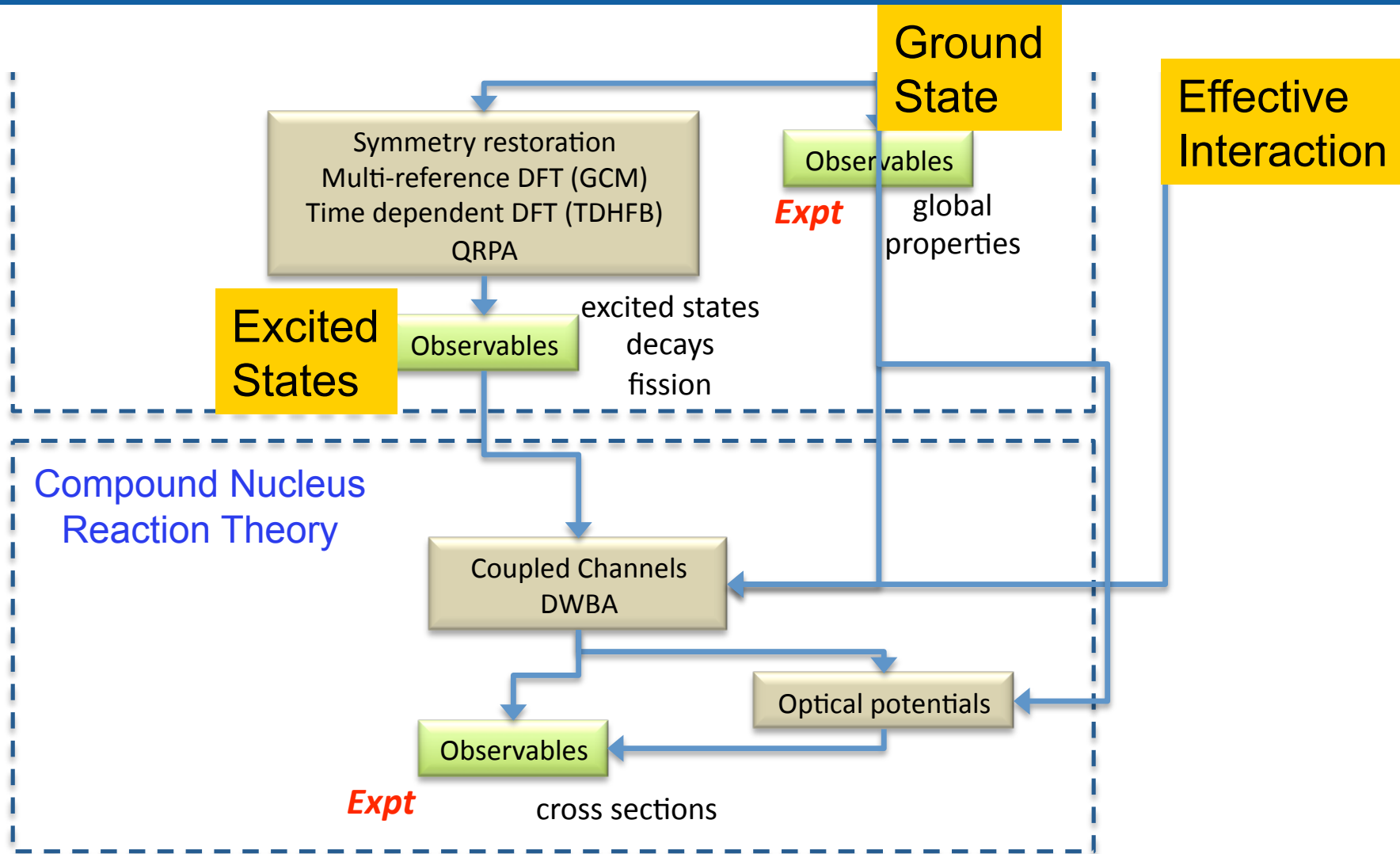


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Part of the UNEDF Strategy



Planned Year-5-End Deliverables

Light-ion Reactions

- Investigate reactions in light nuclei using NCSM with RGM. Some of:
 - Benchmark n - ^8He , and n - ^9Li scattering.
 - Investigate $^3\text{H}+^4\text{He}$ scattering and capture reactions.
 - Use two-, three-, and four-body transition densities for $A=3,4$ nuclei.
 - Development of three-body transition density calculation for $A>4$.
 - Include NNN interaction for $n+A$ and $p+A$ systems

LLNL nucleon-nucleus calculations:

- Determine deuteron optical potentials, including deuteron breakup
- Folding of density-dependent, spin-orbit and charge-exchange forces
- Effects of Skyrminian effective masses in scattering
- First nucleon-nucleus calculations with deformed QRPA transition densities.
- Test new UNEDF functionals
- Support MSU student on optical-potential L -dependences & non-localities in direct reaction calculations.

Arbanas:

- Examine energy-dependence of eigensolutions in the expansion for the KKM theory

