

The UNEDF project

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History of the project

Acronyms

SciDAC: Scientific Discovery through Advanced Computing

UNEDF: Universal Nuclear Energy Density Functional

History

2001 SciDAC program started

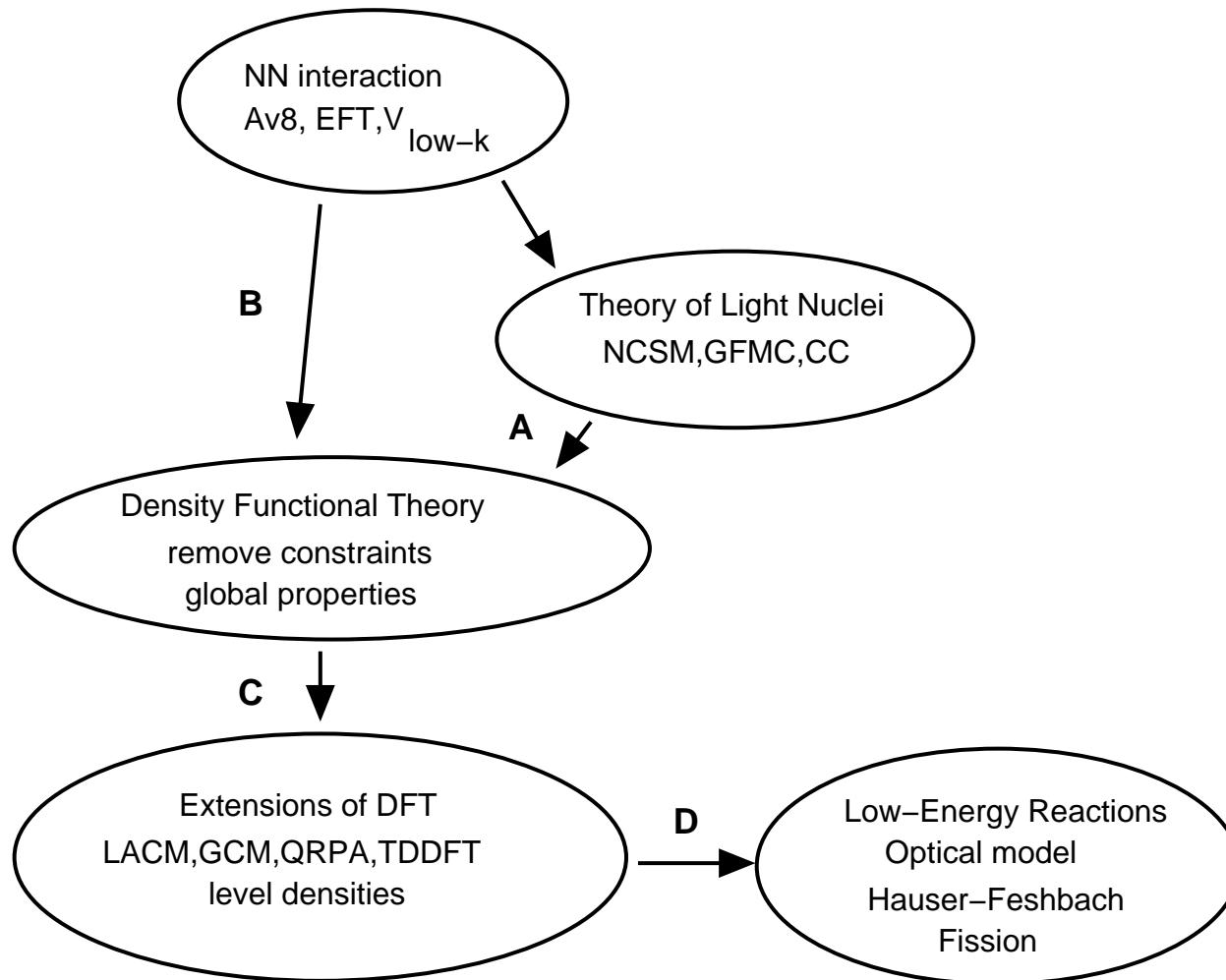
2005 call for new SciDAC proposals

2006 January: NSLER proposal submitted

2006 October: UNEDF proposal accepted

2006 December: nominal starting date

Scientific strategy



First-year activities (1)

Verification of *ab initio* methods

- No-core Shell Model (Vary+)
- Green's function Monte Carlo (Pieper+)
- Coupled Cluster (Dean+)

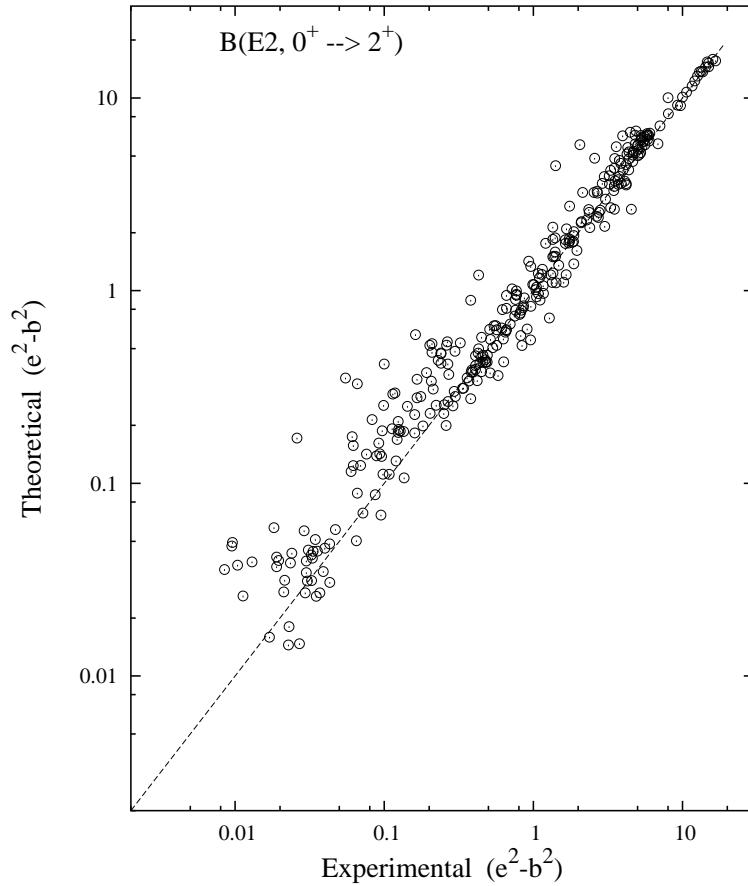
Compare representations for mean-field computation

- 3-D harmonic oscillator (Schunck)
- 3-D mesh (space $\longleftrightarrow_{FFT}$ momentum)
- wavelets (Fann)

Benchmark existing extensions of DFT

- example: CHFB/5DCM for 2+ states

CHFB/5DCM Performance



First-year activities (2)

Mass table including odd nuclei (Dobaczewski+)

Reaction theory warmup (Thompson+)

- Survey of derived optical potentials

An LDA functional from EFT (Furnstahl+)

Future

Codes for DFT + extensions

Unrestricted DFT for mass tables; inclusion of correlations

DFT-based level densities

Fission dynamics

Physics emphasis

