

Some open questions in nuclear fission

We have gained a **qualitative understanding** of the fission process, and explained a large ensemble of fission data (e.g., large-amplitude collective nuclear rearrangement, double-well fission barrier, fission isomers, macroscopic-microscopic model, ...)

A quantitative description of fission remains elusive:

- yields and characteristics (excitation energy, spin, deformation) of fission fragments;
- fission cross section calculations, fission barriers
- multi-modal fission; branching ratios
- light-charged particles accompanying fission
- dissipation between saddle and scission points

Hopes:

- fully self-consistent microscopic calculations, with temperature dependence
- more complete and precise experiments (e.g., ELISE at FAIR, GSI; Time-Projection Chamber, ...)
- modern computers can level many past difficulties (e.g., multi-dimensional calculations of fission barriers)
- ...