Satoshi Chiba Lab

Development of high-precision nuclear data and its applications

Laboratory for Advance Nuclear Energy
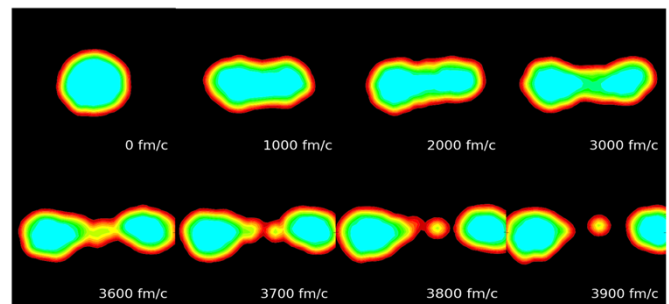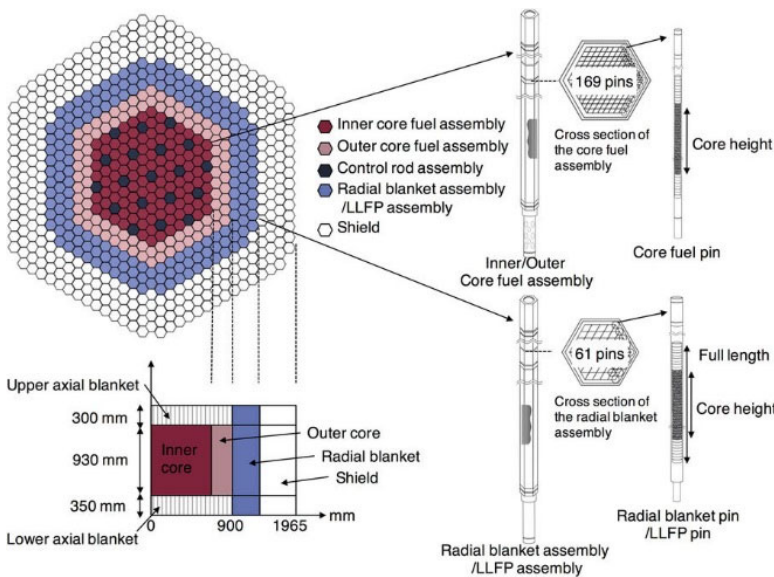
http://www.nr.titech.ac.jp/~chiba/

- Nuclear Data
- Nuclear Fission
- Nuclear Astrophysics
- Nuclear Transmutation

We study nuclear reactions as a fundamental process underlying nuclear energy. Neutron-induced reaction is the source of energy in nuclear reactors, while it serves as origin of elements such as Uranium and Thorium in the cosmos. Understanding of nuclear reactions is, therefore, basis for safe usage of nuclear energy as well as comprehending nature itself. In our laboratory, you can learn the whole process of nuclear data evaluation from the nuclear fission to its applications.
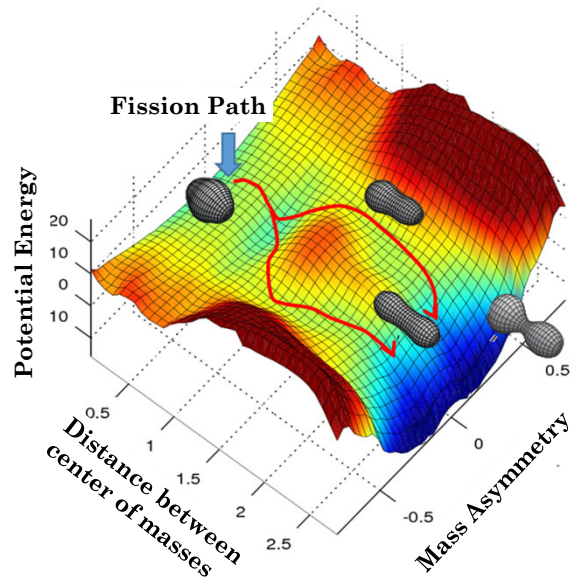
Nuclear shapes on potential energy

Nuclear fission can be described by the time–evolution of a nuclear shape from spherical compound nucleus to separated two fission fragments on the above potential energy surface.

Core layout of the fast spectrum reactor for LLFP transmutation; Reprinting of Scientific Reports 7 : 13961 doi: 10.1038/s41598-017-14319-7 (2017).

Simulation of ^{256}No fission using a microscopic reaction model

A Complete understanding of nuclear fission mechanism is still a big challenge. We have studied the fundamental mechanism of nuclear fissions and fusions, mainly based on theoretical nuclear physics and computational scientific approaches. In the example shown above, an α particle arises in the region in between 2 fission fragments as a ternary particle.