

# Nuclear Fission

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Nuclear Fission was discovered more than 70 years ago. It is a process with many facets. While the main features of fission are nowadays rather well understood there still remain many puzzles being tackled in research going on. Needless to stress that exploiting the process for civil and non-civil uses has had a tremendous impact on our society and continues to be a point of concern.

The course will survey nuclear fission phenomena guided by models from theory but with the emphasis put on the description of experiments and the physical interpretation of the results. The focus will be put on low energy fission exploited in nuclear power reactors.

## Main topics

1. Discovery of fission and its interpretation in the Liquid Drop Model
2. Experimental techniques
3. Fission barriers and shape isomers
4. Fission cross sections. Fissile and fertile nuclei.
5. Fission and nuclear models
6. Spontaneous fission
7. Fission close to the barrier and the fission lifetimes
8. Mass and charge distributions of fission fragments
9. Neutron and gamma emission by the fragments
10. Fission at the limits of phase space: cold fission
11. Fission of very heavy and superheavy nuclei
12. Ternary fission and cluster radioactivity
13. Dissipation and fluctuation in the fission process
14. Elements of Power Reactor operation and the energy release in fission

## Time

February 2012: Monday 04, 11 and 18 from 14:00 to 16:00 o'clock  
Tuesday 05, 12 and 19 from 10:00 to 12:00 o'clock

Auditorium Grünenwald – IPHC bâtiment 25