



WIR SCHAFFEN WISSEN – HEUTE FÜR MORGEN

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Proposal for a new lecture on

“Nuclear interaction: from reactors to stars”

Conseil de section, EPFL, December 7, 2021



Why “nuclear interaction” ?

- Nuclear data (or interaction) is a general term referring to probability of physical interaction between atomic particles (e.g. cross sections, emitted spectra, angular/energy distributions, decay data)
- They are the essential ingredients for
 - Design/operation of nuclear power plants
 - Management of nuclear waste
 - Production of medical radioisotopes
 - Astrophysical quantities
- There is currently no course on nuclear data at the EPFL/ETH Masters (Physics, or engineering).
- A broad introduction to the “nuclear data life cycle” is therefore proposed

Overview of the course (14 weeks), 4 credits

1. Nuclear data needs	2 lectures: 2 x (2h + 2h)
a) Energy	
b) Medical	
c) Astrophysics	
2. Theoretical background	2 lectures: 2 x (2h + 2h)
a) Neutron cross sections	
b) Emitted particles, spectra	
c) Fission yields	
d) Charged-particle induced reactions	
3. Measurement facilities	2 lectures: 2 x (2h + 2h)
a) Accelerators	
b) Reactors	
4. Evaluation	3 lectures: 3 x (2h + 2h)
a) International network	
b) Methods and Tools	
c) Libraries	
5. Application	5 lectures: 5 x (2h + 2h)
a) Processing	
b) Energy, waste	
c) Reaction rates in stars	
d) Radio-isotopes for medical applications	

Type of examination: written

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