

Nuclear and Particle Physics

Module No.: MN-P-SP-Nuc, MN-P-PN-Nuc, MN-P-WaMa

Version: 12.02.2014 AZ

Course: Nuclear Astrophysics

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| Category | Type | Language | Teaching Hours | CP | Semester |
|--------------------|---------|----------|----------------|----|----------|
| Specialized Course | Lecture | English | 2 | 3 | SuSe |

Requirements for participation:

Basic Knowledge in Nuclear Physics

Type of module examinations:

One oral examination at the end of the module

Duration of the course:

1 semester

Aims of the course:

Introduction into basic aspects of experimental and theoretical Nuclear Astrophysics.

Contents of the course:

- Life and death of a star
- Abundance of the elements and isotopes
- Reaction rates on earth and in stars
- Nuclear hydrogen burning: pp chains and CNO cycle
- Nucleosynthesis up to $A \sim 60$
- Synthesis of heavy nuclei: s-, r-, and p-process
- Other processes of stellar nucleosynthesis
- Laboratory experiments

Recommended literature:

C. Iliadis: "Nuclear Physics of stars"

C.E.Rolfs and W.S. Rodney: "Cauldrons in the Cosmos"

D. Arnett: "Supernovae and Nucleosynthesis"