Module: Elective Advanced Lectures: Modern Astrophysics

Module No.: astro850

Course: Nucleosynthesis

Course No.: astro858

Category	Type	Language	Teaching hours	CP	Semester
Elective	Lecture with exercises	English	3+1	6	ST

Requirements for Participation:

Preparation:
Introduction to Astronomy, Stars and Stellar Evolution

Form of Testing and Examination:
Written or oral examination

Length of Course:
1 semester

Aims of the Course:
Obtain an overview of the different nucleosynthesis processes in the universe, an understanding of how they work, and where they work.

Contents of the Course:
Basic: Thermonuclear reactions
Big Bang nucleosynthesis
Overview of stellar evolution
Hydrostatic Nucleosynthesis I: Hydrogen burning
Hydrostatic Nucleosynthesis II: Helium burning and beyond
Hydrostatic Nucleosynthesis III: The s-process
Hydrostatic Nucleosynthesis IV: s-process components
Explosive Nucleosynthesis I: Core-collapse supernovae
Explosive Nucleosynthesis II: r-process and p-process
Explosive Nucleosynthesis III: Thermonuclear supernovae
Cosmic ray nucleosynthesis
Chemical Evolution of galaxies

Recommended Literature:
Lecture script
C.E.Rolfs, W.S.Rodney: Cauldrons in the Cosmos (ISBN 0-226-45033-3), not compulsary
D.D. Clayton: Physics of Stellar Evolution and Nucleosynthesis (ISBN 0-226-10953-4), not compulsary