Nucleosynthesis - astro858

Degree - M.Sc. in Astrophysics (PO von 2014)

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