

**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 compulsory

D.D. Clayton: Physics of Stellar Evolution and Nucleosynthesis (ISBN 0-226-10953-4), not compulsory