

Secondary Area of Specialization

Astrophysics

Module No.: MN-P-PN-Astro

status quo 08.05.2012

	HPW	estimated effort (h)	credit points
Lecture Course	4		
Problem Class	1		
Total	5	240	8

Contents

Core Course Astrophysics II (4+1 hpw):

Based on the introductory course "Astrophysics I" in the Bachelor program this course deepens the understanding in selected topical areas of relevance. These are:

- Interstellar medium: molecular clouds, HII regions, photon dominated regions, shock waves, radiation processes, radiative transfer, astrochemistry
- Star formation (low mass and high mass), planetary system formation
- Galaxies: galactic structure, morphology, dynamics, chemical evolution, nuclei of active galaxies
- Large scale structure of the universe: intergalactic distance ladder, galaxy clusters, dark matter, gravitational lenses, experimental cosmology

Literature

Binney and Merrifield, Galactic Astronomy (Princeton University Press)

Binney and Tremaine, Galactic Dynamics (Princeton University Press)

Carroll and Ostlie, An Introduction to Modern Astrophysics (Addison-Wesley)

Schneider, Einführung in die extragalaktische Astronomie & Kosmologie (Springer, Berlin)

Shu, The Physics of Astrophysics I & II (University Science Books, Mill Valley)

Tielens, The Physics and Chemistry of the Interstellar Medium (Cambridge University Press)

Unsöld and Baschek, Der neue Kosmos (Springer, Berlin)

Weigert and Wendker, Astronomie und Astrophysik (VCH Verlag)

Organization

The module consists of a lecture course, supplemented by a problem class (4+1 hpw in total).

Examinations

The module is passed by passing an oral examination covering the topics of the course attended by the student. To be admitted to the exam, students must actively participate in the problem sessions (including the solution of homework problems).

The grade given for the module is equal to the grade of the oral examination.

Aims

The student will gain the ability to apply fundamental concepts of physics to describe astrophysical phenomena. and will obtain an overview of the experimental foundations of our knowledge about the cosmos. The course will enable him to understand the fundamental principles of the universe and its history.

Prerequisites for Participation

None

Prerequisites

Basic knowledge in astrophysics at the level of the bachelor courses in physics

Frequency

Astrophysics II is offered in the summer term.

Soft Skills

None

Use in Other Courses of Study

As elective subject in other M.Sc. programs

Coordinators

A. Eckart, P. Schilke, J. Stutzki