Astrophysics II (MA) - Astrophysics II

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

Module	**Elective Advanced Lectures: Modern Astrophysics**
Module No.	astro850

Course	**Astrophysics II (MA)**
Course No.	Astrophysics II

Category	**Type**	**Language**	**Teaching hours**	**CP**	**Semester**
Elective	Lecture with exercises	English	4+1	8	WT

Requirements for Participation:

Preparation: Astrophysics I

Form of Testing and Examination: written test

Length of Course: 1 semester

Aims of the Course: 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 courses will enable him to understand the fundamental principles of the universe and its history. The courses also give an introduction to topics of active research in astrophysics and thus prepares the students towards their own research activity within the master thesis.

Contents of the Course:

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

Recommended Literature:

Binney and Merryfield, Galactic Astronomy (Princeton University Press)

Binney and Tremaine, Galactic Dynamics (Princeton University Press)

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

Schneider, Einfhrung 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)