

Module Name Advanced Astrophysics
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Type of Module Basic Module			Module Code BM-AdvAstro			
Identification Number MN-CS-AdvAstro	Workload 270 Hours	Credit Points 9 CP	Term 1. Semester	Offered Every WiSe	Start Winter Term Only	Duration 1 Semester
1	Course Types a) Lecture b) Problem Class		Contact Time 60 h 30 h	Private Study 90 h 90 h		Planned Group Size Students
2	Module Objectives and Skills to be Acquired The students 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 them 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 prepare the students towards their own research activity within the master thesis.					
3	Module Content Based on the introductory course 'Astrophysics' 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					
4	Teaching Methods Lectures and exercises					
5	Prerequisites (for the Module) Formally: none Regarding the content: Astrophysics I					
6	Type of Examination Written test and one oral examination at the end of the module					
7	Credits Awarded The module is passed by passing a written exam. The grade given for the module is equal to the grade of the written exam.					
8	Compatibility with other Curricula The module is part of the Master of Science in Physics.					
9	Proportion of Final Grade 9/114					

10	Module Coordinator Andreas Eckart, Lucas Labadie, Peter Schilke, Jürgen Stutzki
11	Further Information Teaching language: English 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, 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)