

Level: master				
Course title: Nuclear and Particle Astrophysics				
Status: obligatory				
ECTS: 9				
Requirements:				
Learning objectives Nucleosynthesis and particle astrophysics investigate the origin of chemical elements in the universe due to different processes at play: big bang nucleosynthesis, stellar nucleosynthesis, cosmic-ray nucleosynthesis. The goal of this course is to teach the students about the processes that have contributed and still contribute to the synthesis of chemical elements, as well as to teach them about the methods used in scientific research which allow us to, based on measured abundances, make conclusions about nucleo-synthetic processes.				
Learning outcomes After the successful completion of the course "Nucleosynthesis and particle astrophysics" the students will have learned about the theory behind the fundamental processes involved in nucleosynthesis of chemical elements as well as about the methods that are used to test these theories, and thus will be trained to, based on measured abundances, make conclusions about the origin of chemical elements and processes at play.				
Syllabus <i>Theory</i> Overview of thermonuclear reactions and rates; measuring chemical abundances; big-bang nucleosynthesis and the origin of light elements; cosmic abundances - observations and problems; introduction to stellar evolution and synthesis of chemical elements; neutron capture processes; cosmic-ray nucleosynthesis; introduction to galactic chemical evolution. <i>Exercises</i> In the goal of active learning, a lot of attention will be given to practical work both during lectures and in the form of homework assignments and term paper. Students will be encouraged to by using real data make conclusions about origin of elements and chemical evolution, as well as to solve problems during lectures that will later help them successfully complete homework assignments and a written exam. <i>Term Paper</i> The purpose of a term paper is for a student to gain a deeper insight into one specific topic of his choosing. The student will on his own have to search the literature which will help him write a short overview of the topic where main concepts and relevant conclusions will be given. Another important part of the Term Paper Assignment will be the making of and delivering a short in-class presentation of the topic. The goal of this is for students to improve their presenting skill as well as to familiarize all students with all chosen topic.				
Weekly teaching load				Other:
Lectures:4	Exercises:2	Other forms of teaching:1	Student research:	