Level: master

Course title: Astrochemistry

Status: elective

ECTS: 9

Requirements: none

Learning objectives

Astrochemistry is a young interdisciplinary field dedicated mainly to chemistry of the interstellar medium but also to the chemistry of some astronomical objects. The goal of this course is to teach the students about the key mechanisms and chemical reactions that dominate in the extreme conditions in space, compared to those on the Earth.

Learning outcomes

After completion of the course, students will be trained to apply their knowledge and methods from the field of chemistry to conditions typical of space and different astronomical objects in order to study those environments.

Syllabus

Theoretical instruction

Fundamentals of chemical kinetics and dynamics – reaction coefficients and their measurements, reactions of first, second and third order, reversible reactions, complex reactions, unimolecular, bimolecular and trimolecular reactions; chain reactions; Bimolecular collisions in interstellar medium and chemical reactions; Chemical processes of the interstellar medium, meteorites, comets and planets.

Practical instruction

With the goal of in-depth understanding of the content covered in classes, a great deal of attention will be given to practical work where students will be encouraged to process the relevant spectra, which will enable them to learn about the important physical and chemical characteristics of different environments, as well as to solve problems in class, which will help prepare them for homework problems and a written exam.

Term paper

The goal of assigning a term paper is to provide students with a deeper introduction to a specific topic chosen by them. Students will have to independently search the literature and afterwards write a short description of the topic with the task of presenting the key points and their understanding of the topic. An important part of the term paper assignment will be making and delivering an in-class presentation of the topic in order to help improve their presentation skills and share the knowledge about a certain topic with fellow students.

Weekly teaching load				Other:
Lectures: 3	Exercises: 1	Other forms of teaching: 1	Student research:	