FEF3360 Complex Plasmas 8.0 credits

Komplexa plasmor

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Grading scale

G

Education cycle

Third cycle

Specific prerequisites

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After completed course the students should be able to

- appreciate difference between multicomponent and complex (dusty) plasmas
- distinguish different regimes of dust (small body)- plasma interaction

· describe and explain the approaches used in the description of those regimes

discuss applications and interdisciplinary aspects of complex plasmas

Course contents

Charging of particles in complex plasmas. Electrostatic potential around a particle and interaction between particles. Momentum exchange and forces in complex plasmas. Waves and instabilities in complex plasmas. Kinetic theory of complex plasmas. Phase transitions in strongly coupled complex plasmas. Interdisciplinary aspects of complex plasmas. Dust in fusion devices. Dust in space plasmas.

Disposition

Discussion meetings.

Course literature

Complex (Dusty) Plasmas: Current status, open issues, perspectives

V.E. Fortov, A.V. Ivlev, S. A. Khrapak, A.G. Khrapak, G.E. Morfill

Physics Reports, Vol. 421, Nos.1-2, December 2005

Elementary Physics of Complex Plasmas

V.N. Tsytovich, G.E. Morfill, S.V. Vladimirov and H.M. Thomas

(Lect. Notes Phys. 731, Springer, Berlin Heidelberg 2008)

Selected journal papers

Examination

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

Seminar presentations and final oral exam.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.