SK2905 Superconductivity and other Quantum Liquids 7.5 credits

Supraledning och andra kvantvätskor

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

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

Establishment

The course syllabus is valid from Fall 2022 according to the school principal's decision: S-2022-0561 Decision date: 2022-04-13

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Engineering Physics

Specific prerequisites

English B / English 6

Completed course S11146 Vector analysis and S11155 Theoretical physics.

Language of instruction

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

Intended learning outcomes

After finished course the student should be able to:

- apply basic theory and concepts of superconductivity
- analyze and evaluate superconducting applications
- apply basic concepts for other quantum fluids

Course contents

Physical properties of superconductors, London theory, vortices in type-II superconductors, vortex dynamics, Bean's model, Josephson transitions, quantum interference, SQUID, Ginzburg-Landau theory, BCS theory, applications of superconductivity, introduction to other types of quantum fluids (superfluid helium and Bose.Einstein condensate).

Examination

- IMU1 - Hand-in-problems with final oral exam, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- PRO1 - Project, 3.0 credits, grading scale: A, B, C, D, E, FX, F

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.

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.