

Introduction to neutron scattering (E/A) - Neutron Scatt.

Degree - M.Sc. in Physics (PO von 2014)

<i>Module</i>	Elective Advanced Lectures: BCGS Courses
<i>Module No.</i>	physics70d

<i>Course</i>	Introduction to neutron scattering (E/A)
<i>Course No.</i>	Neutron Scatt.

Category	Type	Teaching			Semester
		Language	hours	CP	
Elective	Lecture	English	2	3	ST

Requirements for Participation:

Preparation: Basic knowledge in condensed matter physics

Form of Testing and Examination: Oral examination

Length of Course: 1 semester

Aims of the Course: Understanding of the basic concepts and techniques of elastic and inelastic neutron scattering experiments.

Contents of the Course:

The lecture introduces to the techniques of elastic and inelastic neutron scattering that can be used to determine the crystal or magnetic structure as well as the dispersion of nuclear or magnetic excitations. Topics covered are

Crystal structures and reciprocal space

Neutron powder diffraction

Single-crystal diffraction

Structure refinements

Inelastic neutron scattering

Phonon dispersion

Magnetic excitations

Examples of current research (high-temperature superconductors, manganates with colossal magnetoresistivity, multiferroics)

Polarized neutron scattering

Recommended Literature:

Skriptum (available during the course)

S. W. Lovesey, Theory of Neutron Scattering from Condensed Matter, Oxford (1981)

G. E. Bacon, Neutron Diffraction, Oxford (1979)

Shirane, Shapiro and, Tranquada, Neutr. Scattering with a triple-axis spectrometer, Cambridge (2002)
Izyumov, Ozerov, Magnetic Neutron Diffraction Plenum (1970)
Marshall and Lovesey, Theory of thermal neutron scattering, Oxford (1971)
Squires, Introduction to the theory of Thermal Neutron scattering, Cambridge (1978)