Condensed Matter Physics

Module No.: MN-P-SP-CondMat, MN-P-PN-CondMat, MN-P-WaMa Version: 07.02.2014 SG

Course: Magnetism

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Category	Type	Language	Teaching Hours	CP	Semester
Specialized Course	Lecture	English	2	3	SuSe

Requirements for participation:
Basic knowledge of condensed matter physics

Type of module examinations:
One oral examination at the end of the module

Duration of the course:
1 semester

Aims of the course:
Understanding of magnetism in condensed matter systems

Contents of the course:
The lecture introduces to the magnetism in condensed matter systems. Starting from basic concepts of the magnetic properties of free atoms it is aimed to illustrate the extremely rich field of collective magnetism that arises from the mutual interaction of an extremely large number of interacting particles.

Topics covered are

- magnetism of free atoms
- magnetism of ions in the crystal electric field
- magnetic interactions and ordering phenomena
- magnetic ground states and excitations
- itinerant magnetism
- magnetic frustration and low dimensionality
- magnetic order vs. competing ordering phenomena

Recommended literature:

Scriptum (available during the course)
S. Blundell: Magnetism in Condensed Matter
Ashcroft/Mermin: Solid State Physics
Ch. Kittel: Introduction to Solid State Physics
R.M. White: Quantum Theory of Magnetism
P. Fazekas: Lecture Notes on Electron Correlation & Magnetism
D. Khomskii: Basic Aspects of the Quantum Theory of Solids