THE ORIGIN OF MAGNETISM – FROM QUANTUM NUMBERS TO MAGNETIZATION DYNAMICS

seminar

November 13, 2019 | 4:00 pm Lecture Hall MPI | B.1.11

Abstract

Novel magnetic memory technologies like Racetrack Memory are based on fundamental theories which physicists developed more than a hundred year ago. In this tutorial, we will canvass the these principles of magnetism, its origin and dynamics and various spin-related phenomena. We will talk about quantum numbers, electron orbitals and spin orbit interactions. We will look into ferromagnetism in solids and discuss the Heisenberg exchange interaction, the magnetostatic energy, anisotropy energies and the Dzyaloshinskii Moriya interaction. Finally, also basic principles of band structure and various kinds of Hall effects will be discussed.

In almost all PhD defences in the field of magnetism or spin-related phenomena, fundamental questions about these topics are asked. This tutorial shall be a preparation. Every participant is encouraged to ask any questions. Post-docs are cordially invited to help with their expertise. The tutorial is split into two parts where the first is an introduction which shall lead to vivid discussion with maybe open questions which can be answered in the second part. Additionally, after the first part there will be a homework. This is going to be discussed in the second part in which we deepen our knowledge about more advanced topics.

> **Speaker Robin Bläsing** blaesing@mpi-halle.mpg.de MPI of Microstructure Physics

IMPRS STNTC





MARTIN-LUTHER UNIVERSITÄT HALLE-WITTENBERG



HOW TO GET THERE

Meeting point at the main entrance of building B.

Max Planck Institute of Microstructure Physics Weinberg 2 | 06120 Halle (Saale) | Germany



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UPCOMING EVENTS

November 20, 2019 | 4:00 pm | Lecture Hall MPI | B.1.11

The origin of magnetism - from quantum numbers to magnetization dynamics (Part 2)

Robin Bläsing, MPI of Microstructure Physics

December 4, 2019 | 4:00 pm | Lecture Hall MPI | B.1.11

Tunable pure spin supercurrents and the demonstration of a superconducting spinwave device

Dr. Kun-Rok Jeon, MPI of Microstructure Physics

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