IMPRS TUTORIAL NOV. 20, 2019 • 4:00 pm • Lecture Hall • MPI B.1.11

SPEAKER Robin Bläsing • MPI of Microstructure Physics

The origin of Magnetism – from quantum numbers to magnetization dynamics [Part 2]

ABSTRACT • Racetrack Memory has the potential to replace existing memory devices by allowing high packing density and fast access times while being non-volatile due to saving the information in a magnetic layer.

Its architecture relies on the movement of the magnetic bits, represented by domain walls, by electrical currents. In order to understand the mechanism of domain wall motion, this part of the tutorial focuses on the dynamics of magnetic moments in a nanowire. Starting from the Landau–Lifshitz–Gilbert equation, the equations of motion of domain walls will derived using the Lagrange formalism in a one-dimensional model.

The mathematical results will be visualized by illustrating the torques acting on the magnetization created by the relevant energy terms and spin-transfer torques. Subsequently, the model is extended to antiferromagnetically coupled systems in which the exchange coupling torque plays a major role.

Finally, the threshold current density will be discussed which is a limiting factor for applications like Racetrack Memory.

In contrast to Part I, Part II will be a presentation with only a short discussion afterwards.

MAX PLANCK INSTITUTE
OF MICROSTRUCTURE PHYSICS
Weinberg 2 • 06120 Halle (Saale) • Germany

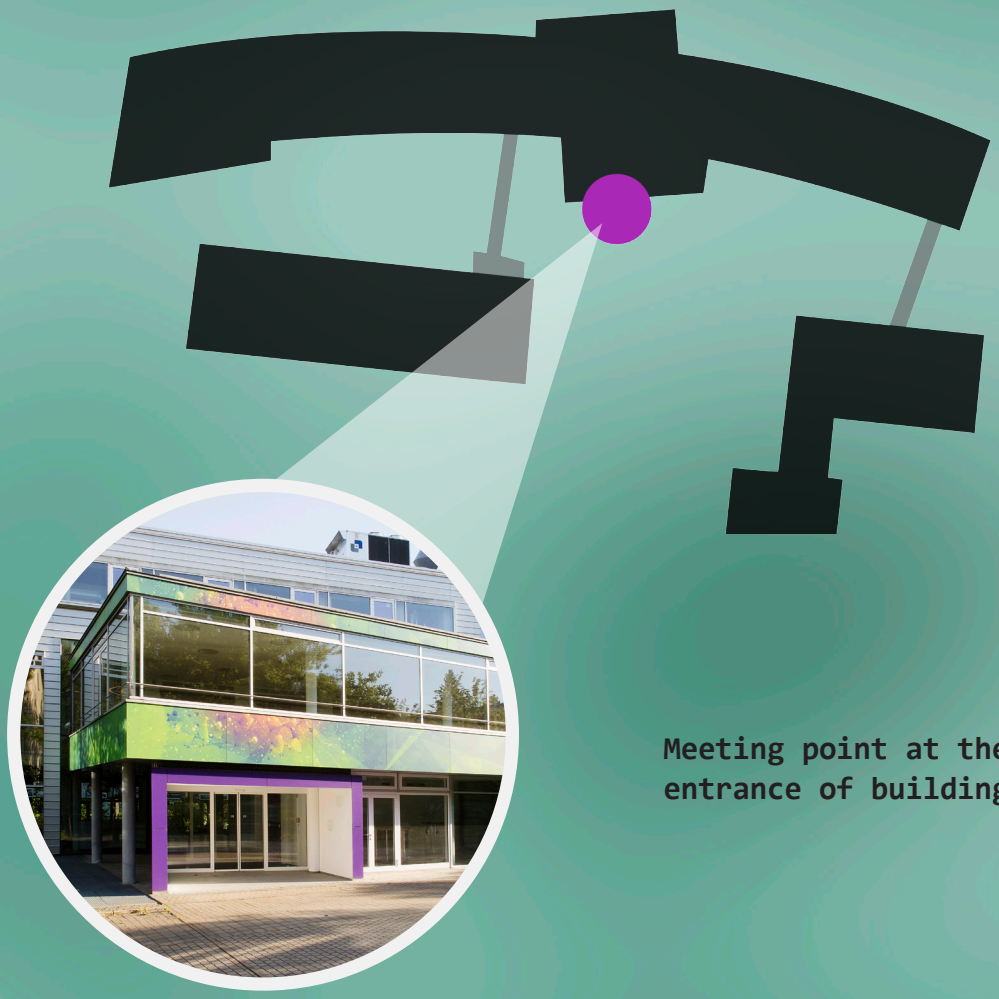
IMPRS STNS

MARTIN-LUTHER UNIVERSITÄT HALLE-WITTENBERG

Fraunhofer IMWS

HOW TO GET THERE

Lecture Hall • MPI B.1.11



Meeting point at the main entrance of building B.

MAX PLANCK INSTITUTE
OF MICROSTRUCTURE PHYSICS
Weinberg 2 • 06120 Halle (Saale) • Germany

IMPRS STNS

MARTIN-LUTHER UNIVERSITÄT HALLE-WITTENBERG

Fraunhofer IMWS

DEC. 4, 2019 • 4:00 pm

Tunable pure spin supercurrents and the demonstration of a superconducting spin-wave device

KUN-ROK JEON • MPI of Microstructure Physics

DEC. 12, 2019 • 11:00 am

Problems of room temperature superconductivity and metallic hydrogen

MIKHAIL EREMETS • MPI for Chemistry, Mainz

MAX PLANCK INSTITUTE
OF MICROSTRUCTURE PHYSICS
Weinberg 2 • 06120 Halle (Saale) • Germany

IMPRS STNS

MARTIN-LUTHER UNIVERSITÄT HALLE-WITTENBERG

Fraunhofer IMWS