

Walther-Meißner-Institut

Bayerische Akademie der Wissenschaften



Mh

SS 2025

Walther-Meißner-Seminar

Seminar Room 143

Date: Tuesday, 13 May 2025, 10:15 h

Speaker: Dongwook Go Peter Grünberg Institut, Forschungszentrum Jülich Institut für Physik, Johannes Gutenberg Universität Mainz

Title: Orbitronics: Crucial role of orbital angular momentum in non-equilibrium

Abstract:

In magnetism research, understanding angular momentum transfer is essential for the development of novel spin-orbitronic devices, where angular momentum carried by quasiparticles is transferred to other degrees of freedom to electrically control magnetic order. While angular momentum is fundamentally encoded in both spin and orbital components, the role of orbital angular momentum has long been underappreciated. Although typically quenched in conventional magnetic materials in the ground state, its crucial role in non-equilibrium processes, in which the orbital angular momentum becomes 'de-quenched', has been predicted in theory and confirmed in experiment. This realization has given rise to the emerging field of **orbitronics**.

This seminar aims to serve two main purposes: first, to provide a bird's-eye view of the key ideas and major developments in orbitronics; and second, to explain the essential physics behind the generation, transport, and transfer of orbital angular momentum in non-equilibrium. I will also highlight current challenges in the field and discuss promising directions to address them.

gez: M.Althammer (Host)

