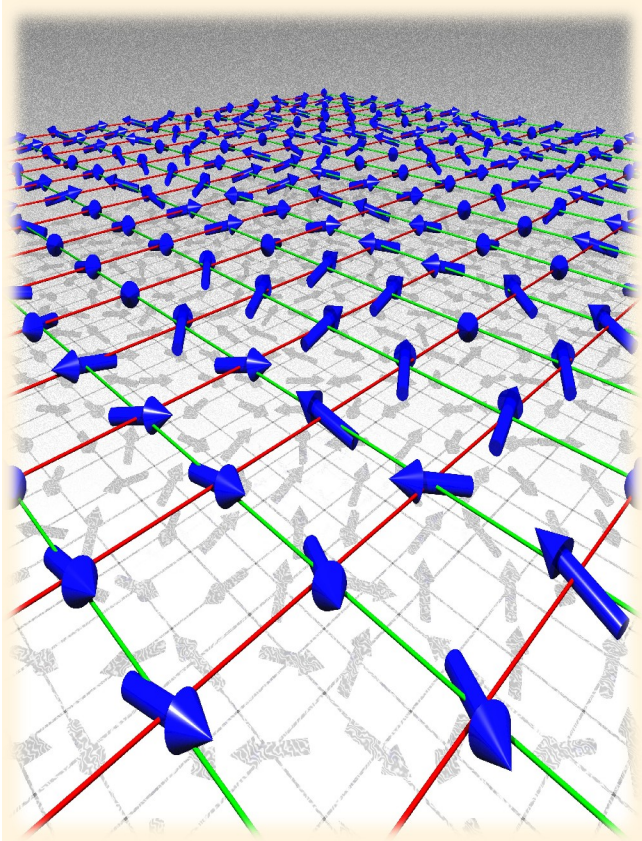


Introduction to Computer Simulations in Condensed Matter Systems

PD Dr. Thomas Gruhn, Dr. Martin Weigel



Syllabus

This lecture series will provide an overview on computational methods for studying properties of condensed matter systems. We will start out with the discussion of standard simulation techniques for the investigation of statistical and dynamical aspects of classical many-body-systems, such as magnetic materials or simple fluids, to then progress to numerical methods and simulation techniques for quantum-mechanical systems. As time permits, discussion of the basic concepts will be accompanied by case studies. The following key approaches are going to be covered:

- Relevant aspects of statistical mechanics
- Classical approaches:
 - The Monte Carlo method
 - Molecular Dynamics simulations
- Quantum mechanical approaches:
 - Density Functional Theory and Hartree-Fock method
 - Car-Parrinello Molecular Dynamics
 - Quantum Monte Carlo

Scope and Requirements

The course addresses newcomers considering to enter the simulation field as well as more experienced students and researchers that would like to get an overview on standard methods of modeling condensed matter systems.

We assume that attendees are familiar with classical mechanics, thermodynamics and quantum mechanics as taught in the standard theory lectures.

When: Wednesday, 2:00pm

Where: Minkowski Room, Staudinger Weg 7, Room 05-119

Kickoff Meeting: Wednesday, 14th of April, 2:00pm, Minkowski Room

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