



Einladung zum Vortrag

Computational Spintronics – From Discrete to Continuous and Back

anlässlich des Habilitationsverfahrens
für das Fach “ Computergestützte Physik ”

von

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Ort: Lise-Meitner-Hörsaal
9. Boltzmannngasse 5, 1. Stock

Abstract:

Since the enormous success of the giant magnetoresistance (GMR) effect for sensor applications, a lot of research has been conducted in order to exploit spintronics effects for technological applications of all kinds. Due to the rapid increase in computational resources, numerical simulations have become an indispensable tool for the development of such devices. Simulations not only allow the development of novel concepts without the need of expensive and time consuming experiments. They further give valuable in-depth insights into physical processes which are not easily accessible through experiments.

This talk will give a brief introduction to micromagnetics, a continuous model for magnetization processes, and its extensions for spintronics. I will discuss the challenges of the numerical solution of this multiscale model which introduces a number of global and local interactions and talk about choices of numerical algorithms in order to tackle these challenges. Furthermore, I will give a brief introduction to some real-world spintronics devices and prove the value of computational spintronics by discussing some findings from my recent investigations.