



EINLADUNG zum IFP-SEMINAR

Spin waves for novel information systems

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Host: Andrei Pimenov

Termin: Mittwoch, 24. Jänner 2024, 16:00 Uhr

Ort: TU Wien, Freihausgebäude

Wiedner Hauptstraße 8-10, 1040 Wien

Seminarraum DC rot 07 (roter Bereich, 7. OG)

Vor dem Vortrag gibt es ab 15:30 Kaffee und Kekse

Abstract:

A disturbance in the local magnetic order of a solid body can propagate in a magnetic material in the form of a spin wave. The quanta of spin waves are referred to as magnons. A wide variety of linear and nonlinear spin-wave phenomena attract interest in both fundamental and applied research. Among the key advantages offered by magnons for data processing are the scalability down to atomic dimensions, the compatibility with existing complementary metal-oxide-semiconductor (CMOS) and spintronic technologies, the operations in the frequency range from several GHz to hundreds of THz, the possibility to process data in the wide temperature range from ultra-low temperatures to room temperature, and the access to pronounced nonlinear phenomena. In my talk, after a general introduction to spin waves, I will address three research directions in which the spin waves and magnons offer particularly high potential: (1) magnon-based processing of Boolean data, (2) the potential of nanoscale spin-wave devices for 5G communication systems, and (3) the first steps towards quantum magnonics at mK temperatures.