MPI für Festkörperforschung
Stuttgart
Abteilung TAKAGI

Institut für Funktionelle Materie
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Universität Stuttgart

Seminar - Abteilung Takagi

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"Tunneling Probe of 2D and Moiré Magnetism"

Abstract:
The discoveries of ferromagnetism in single atomic layers have opened a new avenue for two-dimensional (2D) materials research. Not only do they raise fundamental questions regarding the requirements for long-range magnetic order in low-dimensional systems, but they also provide a new platform for the development of spintronic devices. In this talk, I will present a series of studies on the layered ferromagnetic insulator, CrI_3, both in the atomically thin limit and in twisted homostructures. By incorporating natural 2D CrI_3 as tunnel barriers between graphene electrodes, we are able to achieve extremely large tunnel magnetoresistance and directly observe its spin wave, or magnon, excitation spectrum, from which we can then obtain a simple microscopic Hamiltonian for the monolayer spin system. For twisted CrI_3, we observe evidence for two types of moiré magnetic textures that give rise to nonvolatile tunneling magnetoresistance states switchable by magnetic field.

Tuesday, 7. May 2024 **13:30 a.m.** **4 D 2**

(S. Paulsen, -1501)