TECHNISCHE UNIVERSITÄT WIEN
Vienna University of Technology

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IAP-SEMINAR

ANNOUNCEMENT

Date: **Tuesday, 5.5.2015**
Time: **16:00 p.m.**
Location: **Technische Universität Wien, Institut für Angewandte Physik, E134**
yellow tower „B“, 5th floor, Seminarraum 134A (room number DB05L03)
1040 Wien, Wiedner Hauptstraße 8-10

Lecturer: **Krisztián Palotás**
Budapest University of Technology and Economics, Department of Theoretical Physics, Budapest/Hungary

Subject: **Complex magnetic structures at surfaces and their imaging with STM from first principles**

Abstract: During Recent advances in spin-polarized scanning tunneling microscopy (STM) experiments allow the determination of complex (non-collinear) surface magnetic structures in real space, like spin-spirals, skyrmions. Motivated by these advancements, there is a strong need for theoretical understanding of the observed magnetic structures. In the first part of the talk I present recent theoretical results on a diversity of complex magnetic structures in thin magnetic films at surfaces obtained by a combination of ab initio and spin dynamics calculations. Understanding STM image contrast is of crucial importance in surface science and related technologies. In the second part of the talk I present different tip effects on the STM contrast for a number of technologically relevant surfaces resulting from a combination of first principles calculations and 3D-WKB tunneling theory. Examples include a prototype frustrated hexagonal antiferromagnet, Cr monolayer on Ag(111) and highly oriented pyrolytic graphite. By comparing STM topographic data between experiment and large scale simulations, we can determine particular tip orientations that are most/least likely present in the STM experiment. Finally, I present an extension of Chen's derivative rule for STM simulations including tip-orbital interference effects, and demonstrate the importance of interference effects on the STM contrast for two surface structures: N-doped graphene and a magnetic Mn_2H complex on the Ag(111) surface.

All interested colleagues are welcome to this seminar lecture
(45 minutes presentation followed by discussion).

J. Redinger e.h.
(Seminar-Chairperson)

H. Störi e.h.
(LVA-Leiter)