



TECHNISCHE  
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# IAP-SEMINAR

## ANNOUNCEMENT

- Date:** Tuesday, 26.5.2015  
**Time:** 16:00 p.m.  
**Location:** Technische Universität Wien, Institut für Angewandte Physik, E134  
yellow tower „B“, 5<sup>th</sup> floor, Seminarraum 134A (room number DB05L03)  
1040 Wien, Wiedner Hauptstraße 8-10
- Lecturer:** Dr. Peter Jacobson  
Max-Planck-Institute for Solid State Research, Stuttgart/Germany
- Subject:** Fingerprints of Magnetism in Transport and Force Measurements  
by STM/AFM
- Abstract:** In order to engineer the magnetism of quantum devices, it is necessary to quantify how the structural and chemical environment of the junction influences the spin. Metrics such as coordination number or symmetry provide a simple method to quantify the local environment, but neglect the many-body interactions of an impurity spin when coupled to contacts. We have utilized the highly corrugated hexagonal boron nitride (h-BN) monolayer to mediate the coupling between a cobalt spin in CoH<sub>x</sub> (x=1,2) complexes and the metal contact. While the hydrogen atoms control the total effective spin, the corrugation is found to smoothly tune the Kondo exchange interaction between the spin and the underlying metal. Using scanning tunneling microscopy and spectroscopy together with numerical simulations, we quantitatively demonstrate how the Kondo exchange interaction mimics chemical tailoring and changes the magnetic anisotropy.
- These results are complemented by recent atomic force microscopy measurements on Co spin centers using metallic and hydrogen-functionalized tips. Simultaneous measurements of the tunneling current and forces reveal that as the functionalized tip bonds to CoH, the complex switches from a spin-1 species with magnetic anisotropy to a spin-1/2 complex displaying the Kondo effect.

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

G. Parkinson e.h.  
(Seminar-Chairperson)

H. Störi e.h.  
(LVA-Leiter)