TECHNISCHE UNIVERSITÄT WIEN
Vienna University of Technology

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IAP-SEMINAR

ANNOUNCEMENT

Date: **Tuesday, 10.11.2015**
Time: **16:00 p.m.**
Location: **Technische Universität Wien, Institut für Angewandte Physik, E134**
yellow tower „B“, 5th floor, Sem.R. DB gelb 05 B (room number DB05L03)
1040 Wien, Wiedner Hauptstraße 8-10

Lecturer: **Prof. Dr. Harald Brune**
Institute of Condensed Matter Physics (ICMP), Ecole Polytechnique Féderale de Lausanne (EPFL), Lausanne/Switzerland

Subject: **The Path Towards Single Atom Magnets**

Abstract: Making magnets smaller increases thermal fluctuations of the magnetization direction, magnetization reversal by tunneling, or by scattering with conduction electrons. A magnet is defined as having magnetic bistability (remanence and coercitivity) requiring the spin relaxation time T1 to be larger than the observation time. We briefly review the state of the art in molecular magnets and of clusters assembled at surfaces. We then turn to the ultimate question: Can a single atom be a magnet in a sense that it exhibits remanence, or at least a significant opening of the magnetization curve at higher fields? Since the initial report of large magnetic anisotropy energies for single surface adsorbed atoms of 3*d* elements, many groups reported similarly large values, with Co on MgO(100) being the current record. Nevertheless, these atoms are all perfectly paramagnetic. Recently published spin-polarized STM results report remanence for single Ho atoms on Pt(111). However, using X-ray magnetic circular dichroism, we find for that system a magnetic ground state that is not compatible with long spin coherence times. In addition, a spin-polarized STM study sheds doubt on the interpretation of the data reported ref. as magnetic bistability. Therefore the published literature does not yet report on a single atom that is a stable magnet. We show several possible candidates where indeed a single atom may very well exhibit remanent magnetization.

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

U. Diebold e.h.
(Seminar-Chairperson)

H. Störi e.h.
(LVA-Leiter)