TECHNISCHE UNIVERSITÄT WIEN
Vienna University of Technology

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IAP-SEMINAR

ANNOUNCEMENT

Date: **Tuesday, 30.6.2015**
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: **Dipl.-Ing. Walid Hetaba**
TU Wien, Universitäre Service Einrichtung für Transmissions-Elektronenmikroskopie (USTEM) und Fritz-Haber-Institut der Max-Planck-Gesellschaft, Berlin/D

Subject: **The influence of coherence effects on inelastic electron scattering**

Abstract: Electron energy loss spectrometry (EELS) in the transmission electron microscope (TEM) is used to investigate not only the chemical composition of a sample but also the electronic structure. Furthermore, interference effects in the TEM give rise to a number of powerful techniques.
Combined with electron channelling (energy losses by channelled electrons, ELCE), investigations can be performed in a site-specific manner. This was applied to Rutile in order to investigate the bonding situation and the atomic orbitals. Another powerful technique presented in this talk is energy-loss magnetic chiral dichroism (EMCD), which allows the investigation of the sample's magnetic properties. It was used to perform in-situ measurements on Heusler-alloys, which show a magneto-caloric effect related to a structural transformation. Furthermore, the change in magnetic moments due to the Verwey transition in magnetite was investigated.
For both techniques, ELCE and EMCD, dynamical diffraction strongly influences the measured signal, making simulations necessary for interpretation.
The reported advanced EELS techniques provide insight into the mechanisms of magnetic phase transitions as well as the bonding situation on a nm-scale.

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

H. Störi e.h.
(LVA-Leiter)