TECHNISCHE UNIVERSITÄT WIEN
Vienna University of Technology

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IAP-SEMINAR

EINLADUNG

Termin: **Dienstag, 12.6.2012 um 16:00 Uhr**
Ort: **Technische Universität Wien,**
Institut für Angewandte Physik,
Seminarraum 134A, Turm B (gelbe Leitfarbe), 5. OG
1040 Wien, Wiedner Hauptstraße 8-10

Vortragender: **Prof. C.F. McConville**
Department of Physics, University of Warwick, Coventry CV4 7AL UK

Thema: **Surface Science of Oxide Semiconductors**

Kurzfassung

Oxide semiconductors have become of great interest lately with enormous opportunities for new uses that will potentially improve existing materials and device applications. The fact that some of these materials, such indium tin oxide (ITO), have been around for some time and, in a relatively low quality form have seen significant industrial use as transparent conductors, has perhaps contributed to the belated recognition of the possibilities as semiconductors in their own right. Here, the surface and bulk electronic properties of epitaxially grown high-quality oxide semiconductors (In_2O_3, CdO, and ZnO) will be discussed and the effects of modifying these surfaces by adsorption and surface treatment. Optical, electronic and structural properties of these semiconducting oxide films will be presented. The valence band density of states and the surface electronic properties of these oxide semiconductors have been studied using high-resolution angle-resolve photoemission spectroscopy (ARPES) and compared with theoretical band structure calculations. A common property of these oxide semiconductors is found to be the presence of a surface electron accumulation layer, in marked contrast to the electron depletion generally observed at the surfaces of conventional semiconductor materials. Additionally, hydrogen is found to be a donor and any native defects have a propensity to be donors in already *n*-type material. The origins of this phenomenon will be discussed in terms of the band structure and intrinsic properties of these materials.

Alle interessierten Kolleginnen und Kollegen sind zu diesem Seminar
(45 min mit anschließender gemeinsamer Diskussion) herzlich eingeladen.

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

H. Störi e.h.
(LVA-Leiter)