



TECHNISCHE  
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# IAP-SEMINAR

## EINLADUNG

Termin: **Dienstag, 27.4.2010 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: **Dipl.-Ing. Andreas Buchsbaum**  
TU Wien, IAP

Thema: **Structural and magnetic properties of Fe and Co clusters  
on Alumina on Ni<sub>3</sub>Al(111)**

### Kurzfassung

Growing nanoparticles with well-defined size, shape and structure is an essential prerequisite to understand their magnetic properties. Templates are not only a means to grow regularly arranged clusters but also provide the opportunity to grow well-defined clusters with a narrow size distribution by simple evaporation, taking advantage of the fact that the capture zones of equidistant clusters have equal area.

In particular, I will demonstrate the applicability of an ultrathin alumina film on Ni<sub>3</sub>Al(111) as a template for growing Pd, Fe and Co clusters with a 4.1-nm lattice and a tuneable size between 1 and ≈1000 atoms. The structure of the ≈5 Å thick oxide film exhibits holes at the corner of the ( $\sqrt{67} \times \sqrt{67}$ )R12.2° unit cell reaching down to the metal substrate. Pd atoms trapped in these corner holes create metallic nucleation sites where the clusters can nucleate and form a well-ordered hexagonal arrangement on the oxide nanomesh. We have applied different methods like scanning tunneling microscopy (STM), surface x-ray diffraction (SXRD), grazing-incidence small-angle x-ray scattering (GISAXS) and x-ray magnetic circular dichroism (XMCD) to determine the morphology, crystallographic and magnetic properties of the clusters.

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

*P. Varga e.h.  
(Seminar-Chairperson)*

*H. Störi e.h.  
(LVA-Leiter)*

