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UniCat Lecture

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Lecturer: **Dr. Marc Heggen**, Ernst Ruska-Centre for Microscopy and Spectroscopy with Electrons, Forschungszentrum Juelich GmbH, Juelich, Germany

Title: **Dislocations in the Complex Metallic Alloy T-Al-Mn-Pd**

Abstract: The deformation mechanisms of complex metallic alloys – crystalline solids containing up to thousands of atoms per unit cell – are widely unknown. Due to the large lattice parameters of these materials, conventional dislocation mechanisms are prone to failure.

We investigated the complex metallic alloy T-Al-Mn-Pd with 156 atoms per unit cell using aberration-corrected high-resolution transmission electron microscopy [1]. A novel and highly complex deformation mechanism was found which is based on the movement of a dislocation core mediating strain and separate escort defects. Upon deformation, the escort defects move along with the dislocation core and locally transform the material structure. This mechanism implies the coordinated movement of hundreds of atoms per elementary step. Although the mechanism is very complex, it can be described by a simple jigsaw-puzzle-like rearrangement of basic structural subunits.

[1] M. Heggen, L. Houben, M. Feuerbacher, Nature Materials 9 (2010) 332 – 336.

Date: **Wednesday, 24 November 2010**

Time: **3:00 pm - around 6:00 pm**

Location: **TU Berlin, Institute of Chemistry, Building TC, Straße des 17. Juni 124, 10623 Berlin, Room TC 14**

Organiser: Prof. Dr. Peter Strasser (TUB)

Guests are cordially invited to attend!

Prof. Dr. Matthias Driess, Chair of the Cluster of Excellence UniCat