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Unifying Concepts in Catalysis

UniCat Colloquium

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Lecturer: **Prof. Dr. M. Claude Henry**, Centre National de la Recherche Scientifique (CNRS), Campus de Luminy, Université Aix-Marseille, France

Title: **Regular Arrays of metallic clusters on ultrathin alumina films: a new type of planar model catalysts**

Abstract: The catalytic activity of supported metallic nanoparticles depends on their size, their morphology but also on their spatial distribution and eventually on the nature of the support. By epitaxial growth on oxide single crystals it is possible to control the density and the size of the particles but with a finite size dispersion which is at the best 25% of the mean size. A well defined shape, close to the equilibrium shape, can be obtained by high temperature growth.

We will show that nanostructured ultrathin films of alumina obtained by high temperature oxidation of a Ni_3Al (111) substrate represents a perfect template to grow regular arrays of metallic clusters. By successive condensation of Pd and Au, regular arrays of bimetallic clusters are obtained for which the size and the chemical composition are independently controlled. The long range order of these arrays of clusters has been studied by GISAXS. The stability of the organization of Pd and PdAu nanoclusters arrays has been studied by STM.

Finally the reactivity of Pd clusters arrays towards CO has been studied by a molecular beam technique. We will see that the regular organization of the nanoparticles allows to study quantitatively the reverse spillover of the CO from the alumina to the Pd clusters and then it opens the way to study accurately size effects on heterogeneous catalysts.

Date: **Wednesday, 04 November 2009**

Time: **5:15 pm - around 6:45 pm**

Location: **TU Berlin**
Institute of Chemistry, Building C
Straße des 17. Juni 115, 10623 Berlin
room C 243

Organiser: Prof. Dr. Ludger Wöste (FUB)

Coffee and tea will be served thirty minutes prior to the lecture start.
Guests are cordially invited to attend!

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