REPORT on the

56th IUVSTA workshop on

Template mediated growth of nanostructures

November 3, 2008 – November 6, 2008

Stadtschlaining, Austria

Organisors:

Florian Mittendorfer (Univ. Vienna)
Georg Kresse (Univ. Vienna)
Peter Varga (TU Vienna)

Scientific Committee:

Erminald Bertel (Univ. Innsbruck)
Falko Netzer (Univ. Graz)
Raimund Podloucky (Univ. Vienna)
Josef Redinger (TU Vienna)
Peter Zeppenfeld (Univ. Linz)

Summary

Nanoscience is an emerging field of physics and chemistry that has attracted an enormous amount of attention in the recent years. It is focused on the novel properties of structures with dimension of only a few nanometers, so-called nanostructures, offering unique electronic applications. Nevertheless, one of the major problems that has to be overcome for a successful technological application is finding a reliable method for the creation of the nanostructures. Although the common approaches follow a top-down approach for the creation (lithography etc.), more recent attempts focus on creating the nanostructures in a bottom-up approach, that is by the self-assembly of the constituents on surface. Consequently the search for suitable templates is of uttermost importance.

The workshop *Template mediated growth of nanostructures* has been focused on several aspects of this topic. The following topics have been discussed :

- The creation and the properties of 2-dimensional nanomeshes (BN, graphene)
- Nanostructured oxide surfaces
- Templates for the growth of nanoclusters and nanostripes
- Growth of low-dimensional metallic and oxidic nanostructures
- Assembly of magnetic nanostructures
- Optical properties of nanostrucutres
- Self-assembly of organic molecules

Justification of costs

The financial support from IUVSTA has allowed to invite nine high-profile speakers to the workshop, and thus offered an important contribution to the success of the workshop. Consequently, the IUVSTA support has been used to cover the travel expenses, and partially the costs of accommodation, of the invited speakers.

IUVSTA Funding received	6431.78 E (10.000 CHF)
Travel refund (9 inv.speakers)	-4666.89 E
Accomodation*	-1786.00 E
TOTAL……..	-6434.00 E

*only part covered by the IUVSTA funding

Final scientific program

Monday, 03. 11. 2008

07:30 – 08:30	BREAKFAST
08:45 – 09:00	Welcome
09:00 – 10:00	**Greber** (invited): Boron nitride nanomesh: a robust template for molecule and cluster arrays
10:00 – 10:30	**Dong** : Formation of boron nitride nanomesh on Rh(111)
10:30 – 11:00	COFFEE
11:00 – 12:00	**Chambers** (invited): Statistical Analysis of dopant distribution and segregation issues in transition metal oxide nanoparticles and epitactical films
12:00 – 12:30	**Camacho** : Optical anisotropies of metal clusters supported on insulating birefringent substrates
12:30 – 14:00	LUNCH
14:00 – 15:00	**Michaelidis** (invited): Towards an understanding of ice nucleation on the nanoscale
15:00 – 15:30	**Cordin** : Phase separation in the system Br/Pt(110)
15:30 – 16:00	**Amman** : Surface-resonance Fermi surfaces in Pt(110) and its adsorbate systems
16:00 – 16:30	COFFEE
16:30 – 17:00	**Schmid** : Pulsed Laser deposition: nucleation and initial growth on the atomic scale
17:00 – 17:30	**Hammer** : Growth of atomic-size metal chains with tuneable width
17:30 – 18:00	**Li** : Low-dimensional Mn oxide nanostructures on flat and stepped Pd(100) surfaces
18:00 – 18:30	**Seriani** : Palladium in selective hydrogenation catalysis
18:30 – 19:30	DINNER

Tuesday, 04. 11. 2008

07:30 – 08:30	BREAKFAST
08:30 – 09:30	**Pacchioni** (invited): Nanostructured oxide films as tuneable supports for metal clusters and nanoparticels
09:30 – 10:00	**Weirum** : Growth of ZnO on Pd(111)
10:00 – 10:30	**Merte** : Characterization of moiré-structured FeO(111) thin films by STM
10:30 – 11:00	COFFEE
11:00 – 12:00	**Goniakowski** (invited): Polarity in oxide ultrathin films
12:00 – 12:30	**Stöhr** : Ab inito phase digram of oxygen adsorption on W(110)
12:30 – 14:00	LUNCH
14:00 – 14:30	**Franz** : Kinetic Monte Carlo simulations of desorption spectra
14:30 – 15:00	**Kratzer** : Kinetics of Zn adsorption/desorption on Pd(111)
15:00 – 15:30	**Stadlmayr** : Growth, stability and structure of Zn/Pd(111)
15:30 – 16:00	**Schennach** : Theoretical aspects of Pd-Zn systems
16:00 – 16:30	COFFEE
16:30 – 17:30	**Bode** (invited): The surprising world of self-assembled magnetic nanostructures explored by spin-polarized STM
17:30 – 18:00	**Teichert** : Self-organized semiconductor surfaces as templates for nanomagnet arrays
18:00 – 18:30	**Buchsbaum** :Structural and magnetic properties of Fe and Co clusters on Alumina/Ni_3Al(111)
18:30 – 19:30	DINNER
19:30 – 21:00	Project meeting of NSOS

Wednesday, 05. 11. 2008

07:30 – 08:30	BREAKFAST
08:30 – 09:30	**Michely** (invited): Cluster lattices on a graphene moire
09:30 – 10:00	**Sun** : Growth and desorption kinetics of sexithiophene on Ag(110): an in-situ fast reflectance difference spectroscopy study
10:00 – 10:30	**Ruffieux** : Template-mediated self-assembly of supramolecular nanostructures
10:30 – 11:00	COFFEE
11:00 – 11:30	**Gumbsch** : Single-atom spectroscopy: Co adatoms on Cu(110) and Cu(110)2x1-O surfaces
11:30 – 12:30	**Brune** (invited): Successful and Unsuccessful Creation of Magnetic Superlattices
12:30 – 14:00	LUNCH
14:00 – 15:00	**Schäfer** (invited): Self-organized one-dimensional atom chains on semiconductor templates
15:00 – 15:30	**Rönspies** : Metallic nanostructures: Combining nanolithography of atomic-sized nanowires with self-organization of Pb on Si(557)
15:30 – 16:00	**Allegretti** : Surface chemistry on clean and oxidised 1-D Ni-Rh nanostructures
16:00 – 16:30	COFFEE
16:30 – 17:00	**Wagner** : Cu-O: template and/or surfactant?
17:00 – 17:30	**Demirici** : CO adsorption states on the Ni-Cu surface alloy
17:30 – 18:00	**Vogtenhuber** : Structural investigations of the N/Cu(110) template
18:00 – 18:30	**Hohage** : Correlation between magnetic properties and morphology of Ni grown on adsorbate modified Cu(110) substrates
18:30 – 19:30	DINNER

Thursday, 06. 11. 2008

07:30 – 08:30	BREAKFAST

09:00 Shuttle to Vienna Airport

List of participants

Allegretti	Francesco	Univ. Graz
Amman	Peter	Univ. Innsbruck
Bachmann	Magdalene	Univ. Innsbruck
Bertel	Erminald	Univ. Innsbruck
Bode	Matthias	Argonne NL,USA
Braun	Christian	Univ. Innsbruck
Brune	Harald	EPFL, Lausanne
Buchsbaum	Andreas	TU Wien
Camacho	Manuel Flores	Univ. Linz
Chambers	Scott	PNNL, USA
Cordin	Michael	Univ. Innsbruck
Demirci	Erkan	TU Graz
Dong	Guocai	Univ. Leiden, NL
Dubout	Quentin	EPFL, Lausanne
Franchini	Cesare	Univ. Wien
Franz	Thomas	Univ. Wien
Goniakowski	Jacek	INSP Paris
Greber	Thomas	Univ. Zürich
Gubo	Matthias	Univ. Erlangen
Gumbsch	Andreas	Univ. Graz
Hammer	Lutz	Univ. Erlangen
Hejduk	Pawel	PAS, Krakow
Hohage	Michael	Univ. Linz
Kratzer	Markus	TU Graz
Kresse	Georg	Univ. Wien
Li	Fanghua	Univ. Graz
Memmel	Norbert	Univ. Innsbruck
Menzel	Alexander	Univ. Innsbruck
Merte	Lindsay	iNANO, DK
Michaelides	Angelos	UCL London
Michely	Thomas	Univ. Köln
Mittendorfer	Florian	Univ. Wien
Netzer	Falko	Univ. Graz
Pacchioni	Gianfranco	Univ. Milano
Parteder	Georg	Univ. Graz
Podloucky	Raimund	Univ. Wien
Ramsey	Michael	Univ. Graz
Redinger	Josef	Univ. Wien
Rönspies	Jan	Univ. Hannover
Ruffieux	Pascal	EMPA, CH
Schäfer	Jörg	Univ. Würzburg
Schennach	Robert	TU Graz
Schmid	Michael	TU Wien
Seriani	Nicola	Univ. Wien
Sha	Sameena	TU Wien
Spiridis	Nika	PAS, Krakow
Stadlmayr	Werner	Univ. Innsbruck
Stöhr	Markus	Univ. Wien
Stroppa	Alessandro	Univ. Wien
Sun	Lidong	Univ. Linz
Surnev	Svetlozar	Univ. Graz
Teichert	Christian	Univ. Leoben
Varga	Peter	TU Wien
Vogtenhuber	Doris	Univ. Wien
Wagner	Magarete	Univ. Graz
Wagner	Thorsten	Univ. Linz
Wang	Xin	TU Wien
Weirum	Gunther	Univ. Graz
Zabloudil	Jan	Univ. Wien
Zeppenfeld	Peter	Univ. Linz