

SC #9: " International summer school on physics at nanoscale ", to be held at Devet Skal, Czech Republic, June 16-21, 2008. Proposing Division: SSD, supported by NSD and EMPD
Web-Site: <http://www.fzu.cz/~iss/>

A report on this school has been submitted by Antonin Fejfar via e-mail on July 11th, 2008:

Summary of the 9th IUVSTA summer school on Physics at Nanoscale, 16th to 21st June 2008, Devet Skal, Czech Republic

The school brought together 136 people (17 speakers, 94 participants and 25 company representatives) from 20 countries (Australia, Austria, Belorussia, Belgium, Czech Republic, China, France, Germany, India, Iran, Israel, Italy, Japan, Lithuania, Russia, Slovakia, The Netherlands, Ukraine, United Kingdom, USA). 19 industrial companies presented their products or profiles at the school. The participants presented their research during the poster session with 39 posters.

School programme was devoted in particular to the fields of

1. Nanostructures, surface and thin films
2. Nanooptics and photonics
3. Nanoelectronics and spintronics
4. Nanostructured solar cells

The school speakers gave the following lectures:

Y. KANEMITSU, Institute for Chemical Research, Kyoto University, Japan:
*Nanophotonics *

J. GÃ“MEZ RIVAS, FOM Institute AMOLF, c/o Philips Research, Eindhoven, The Netherlands:
Semiconductor *nanowires,*
Light emission close to metals

L. RANNO, Dept. Nanosciences, Institut NÃ©el, CNRS/UJF, Grenoble, France:
Nanomagnetism and spintronics

J. WUNDERLICH, Hitachi Cambridge Laboratory, Cambridge, UK:
Voltage controlled spintronics effects based on spin-orbit interaction

K. LIPS, Helmholtz Institute Berlin, Germany:
Qubits in silicon

A. SHAH, Institute of Microtechnology, University of NeuchÃ©tel, Switzerland:
Thin-film silicon solar cells:
*1) General overview, *
2) Efficiency limits and production issues

A. ZABAN, Institute for Nanotechnology and Advanced Materials, Bar-Ilan University, Israel:
*Dye sensitized solar cells for low cost multi-bandgap photovoltaics *

T. SCHMIDT, University of Sydney, Australia:

Nanostructures for next-generation solar cells

*1) **Quantum theory of matter on the Ångström-scale**: **molecules, particle in a box, quantum dots and solids *

*2) **Defeating the Shockley-Queisser limit

R. A. JANSSEN, Eindhoven University of Technology, The Netherlands:

Organic solar cells

D. VUILLAUME, Institute for Electronics, Microelectronics & Nanotechnology CNRS, University of Science and Technology of Lille, France:

Electronic properties of organic nanostructures & molecular-scale devices

K. ENSSLIN, ETH Zürich, Switzerland*: *

1) Coulomb blockade in quantum dots

*2) **Quantum physics with quantum dots*

S. MAIER, Imperial College, London, UK:

Plasmonics and plasmonic metamaterials

B. ALTSHULER, Columbia University, New York, USA:

*Optics of electrons **in graphene*

G. KRESSE, University of Vienna, Austria:

*1) **Many electron calculations using density functional theory: successes, failures, and future developments*

2) Ab initio modeling of nanostructures

P. VARGA, Vienna University of Technology, Austria:

Surface nanostructures

Each speaker gave two lectures of 45 minutes each, with the first introductory part followed by more advanced topics scheduled usually half a day or a day later to provide time for the audience to digest the information and/or to provide feedback to the speaker.

In addition to the invited speakers above we have also organized a focused session with two shorter lectures by the representatives of the leading Czech research laboratories:

J. HOMOLA, Institute for Photonics and Electronics ASCR, Prague:

Biosensors with surface plasmons

B. REZEK, Institute of Physics ASCR, Prague*: *

Functionalized diamond nanostructures

The participants presented their research during the poster session with 39 posters.

The best posters were awarded prizes as follows:

1. J. Čermák, A. Kromka, B. Rezek: Localised charging of oxidised

Nano-crystalline diamond surfaces by AFM tip

2. K. Kazlauskas, P. Vitta, A. Ą½zkauskas, A. Dementjev, V. Gulbinas, L. Valkānas, N. Ostapenko, S. Suto â€ Temperature independent exciton relaxation in poly(di-n-hexylsilane) confined in nanoporous silica
3. L. Ąustr, L. Lovicar, O. Tomanec, R. Kalousek, P. Dub, T. Ąikola: Excitation and Detection of Surface Plasmon Polaritons

The traditional industry evening took part on Wednesday with participation of the following companies:

Chromspec (www.chromspec.cz)

*FEI** Czech Republic** (www.fei.cz)***

H-Test (www.htest.cz)

HVM Plasma (www.hvm.cz)

Q-Cells (www.qcells.de)

Labimex (www.labimex.cz)

Manfred Baumann Science Services

Oerlikon Solar (www.oerlikon.com/solar)

Omicron Nanotechnology (www.omicron.de)

On Semiconductor (www.onsemi.com)

Optaglio (www.optaglio.cz)

Pfeiffer Vacuum Austria (www.pfeiffer-vacuum.net)

Pragolab (www.pragolab.cz)

RMI (www.rmi.cz)

SHM (www.shm-cz.cz)

Spolchemie (www.spolchemie.cz)

Optik Instruments (www.brukeroptics.cz)

Tescan (www.tescan.cz)

UniExport Instruments (www.uniexport.co.cz)

The company evening takes place as an exhibition where the company present their products of profiles at the stands. Participation of the companies is important also for linking the participants with the industry. This was also subject of the panel discussion on Thursday evening which focused on the topic â€How to start a high-tech companyâ€, which was moderated by Prof. A. Shah (Neuchatel University). The panel was composed of J. Klāma (CEO of Tescan Ltd., producer of SEMs) and J. Vyskoā il (CEO of HVM Plasma Ltd., producing equipment for nanostructured hard coatings).

The school organization relied also on the Czech Vacuum Society and Czech Physical Society and last, but not least, a group of the academic research institutes and universities listed at the school web page www.fzu.cz/~iss <<http://www.fzu.cz/%7Eiss>>.

CD-ROM proceedings of the school is now being prepared, containing the presentations from the school, posters, list of contacts to the lecturers, participants and participating industry etc. Reduced version of the proceedings will be also available at the summer school web page (www.fzu.cz/~iss).

END OF REPORT