Nanotechnology: Potential and Challenges

2nd Summer School of the German-Japanese University Network HeKKSaGOn
Karlsruhe Institute of Technology, September 1-10, 2014

Heidelberg University, Kyoto University, Karlsruhe Institute of Technology,
Tohoku University Sendai, University of Göttingen, Osaka University

Date: September 1-10, 2014
Venue: Karlsruhe Institute of Technology
      Campus South
      Karlsruhe, Engelbert-Arnold-Str. 2
      Building 11.30, Senatssaal (3rd floor)

Scientific coordinator: Prof. Dr. Wolfgang Wenzel, Institute of Nanotechnology
Organizational support: Dr. Irene Huber, Elena Pfeifer, KIT International Affairs

PROGRAM

Sunday, August 31
Arrival of participants
Check-in at Leonardo Hotel Karlsruhe

Monday, September 1
08:30-09:00 Transfer from Leonardo Hotel Karlsruhe to KIT Campus South, Building 11.30
(only on the first conference day)
09:00-10:00 Poster set up & registration
10:00-10:30 Prof. Dr. Volker Saile, Head of Division V, Karlsruhe Institute of Technology
           Welcome and opening speech
10:30-11:00 Prof. Dr. Horst Hahn, Institute of Nanotechnology, Karlsruhe Institute of Technology
           Welcome and opening speech
11:00-11:40 Prof. Dr. Keiichi Kodaira, Japan Society for the Promotion of Science (JSPS)
           Greeting message from the Japanese Consulate in Munich
           Introduction to the International Programs of JSPS
11:40-12:00 Group Photo
12:00-13:00 Lunch buffet, Senatssaal Foyer (Build. 11.30)
13:00-13:45  Simone Pfieger, Economic Development Department, City Karlsruhe  
*International Impulses for a Smarter City*

13:45-14:30  Prof. Dr. Horst Hahn, Institute of Nanotechnology, Karlsruhe Institute of Technology  
*Academic Keynote*

14:30-14:45  Coffee break

14:45-16:15  Session 1 – Nanophotonics  
Prof. Dr. Akihiro Kusumi, Kyoto University  
*Tracking single fluorescent molecules at work in living cells: Revealing organizing principles of the plasma membrane for signal transduction*

Dr. Wolfram Pernice, Karlsruhe Institute of Technology  
*Nanophotonics meets Nanomechanics – light force devices on a chip*

16:15-18:00  Welcome reception, Senatssaal Foyer (Build. 11.30)

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**Tuesday, September 2**

09:00-09:45  Anna Ahrens, Japanese-German Business Association  
*Nanotechnology in Japan and Germany*

09:45-10:30  Dr. Rainer Mueller, Germany Trade and Invest  
*Initiative Nano in Germany*

10:30-10:45  Coffee break

10:45-12:00  PhD Presentations + Discussion (Block 1)

12:00-13:00  Lunch break, KIT canteen (Line 6)

13:00-14:30  Session 2 – Nanoparticles  
Prof. Dr. Yasuo Nozue, Osaka University  
*Electrons in Periodic Nanospace; Superatom Crystals*

Prof. Dr. Guido Clever, University of Göttingen  
*Functional Self-Assembled Nanocages*

14:30-14:45  Coffee break

14:45-16:00  Brainstorming Session – Nanoparticles

16:00-18:00  Poster Session

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**Wednesday, September 3**

09:00-10:30  Session 3 – Nanoelectronics  
Prof. Dr. Wolfgang Wenzel, Karlsruhe Institute of Technology  
*Multiscale modelling of nanoscale materials and electronic transport*

Prof. Dr. Mario Ruben, Karlsruhe Institute of Technology  
*Supramolecular Quantum Spintronics*
10:30-10:45  Coffee break
10:45-12:00  PhD Presentations + Discussion (Block 2)
12:00-13:00  Lunch break, KIT canteen (Line 6)
13:00-14:15  Alexander Legant, Nanoscribe Company GmbH
              *3D laser lithography and applications in R&D*
14:15-14:30  Coffee break
14:30-15:00  Transfer to KIT Campus North
15:00-16:30  Guided tour at KIT Campus North, visit of selected experimental facilities:
              ANKA (Synchrotron Radiation Facility) and KATRIN (Karlsruhe Tritium Neutrino experiment)
16:30-18:00  Visit to Nanoscribe Company GmbH, KIT-Hightech-Incubator

**Thursday, September 4**

09:00-10:30  **Session 4 – Surfaces**
             **Prof. Dr. Winfried Teizer**, Tohoku University Sendai and Texas A&M University, USA
             *Molecular Motors on Functionalized Surfaces*
             **Prof. Dr. Wulf Wulfhekel**, Karlsruhe Institute of Technology
             *Single-molecule spintronics with STM*
10:30-10:45  Coffee break
10:45-12:00  PhD Presentations + Discussion (Block 3)
12:00-13:00  Lunch break, KIT canteen (Line 6)
13:00-14:30  **Session 5 – Nanocarbon**
             **Prof. Dr. Katsumi Tanigaki**, Tohoku University Sendai
             *Interfaces between carbon materials and inorganic materials: fundamentals and applications*
             **Prof. Dr. Ralph Krupke**, Karlsruhe Institute of Technology
             *Optoelectronics with Molecular Nanostructures*
14:30-14:45  Coffee break
14:45-16:30  PhD Presentations + Discussion (Block 4)
16:30-18:00  **Brainstorming Session – Nanocarbon**

**Friday, September 5**

09:00-10:30  **Session 6 – Nanophotonics**
             **Dr. Thomas Burg**, University of Göttingen
             *Microdevices for nanoparticle analysis, biophysics, and microscopy*
             **Prof. Dr. Carsten Rockstuhl**, Karlsruhe Institute of Technology
             *Amorphous Nanophotonics*
10:30-10:45  Coffee break
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| 10:45-12:00   | **Session 7 – Nanomagnets/Surfaces**  
  *Prof. Dr. Rüdiger Klingeler*, Heidelberg University  
  *Functional magnetic nanomaterials*  
  *Prof. Dr. Taro Hitosugi*, Tohoku University Sendai  
  *Investigation of perovskite oxides using STM* |
| 12:00-13:00   | Lunch break, KIT canteen (Line 6)                                                 |
| 13:00-14:30   | PhD Presentations + Discussion (Block 5)                                          |
| 14:30-14:45   | Coffee break                                                                     |
| 14:45-15:30   | **Dr. Amer Baniodeh**, Karlsruhe Institute of Technology  
  *3d/4f Coordination Clusters as Single Molecule Magnets* |
| 15:30-17:00   | **Brainstorming Session: Nanoelectronics**                                      |

**Saturday, September 6**

*Cultural excursion to Heidelberg (see website and attachment)*

**Sunday, September 7**

*Karlsruhe Sightseeing Tour from 11 a.m. to 1 p.m. (see website and attachment)*

**Monday, September 8**

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| 09:00-10:30   | **Session 8 – Surfaces**  
  *Prof. Dr. Motofumi Suzuki*, Kyoto University  
  *Evolution of Nanomorphologies Induced by Glancing Angle Deposition*  
  *Prof. Dr. Reiner Dahint*, Heidelberg University  
  *Core/shell nanoparticle sensors for the label-free detection of protein/peptide interactions in array format* |
| 10:30-10:45   | Coffee break                                                                     |
| 10:45-12:00   | PhD Presentations + Discussion (Block 6)                                          |
| 12:00-13:00   | Lunch break, KIT canteen (Line 6)                                                 |
| 13:00-13:30   | **Dr. Michael Marz**, Karlsruhe Institute of Technology  
  *Quantum size effects in Pb islands on Si(111) studied with KPFM* |
| 13:30-14:30   | PhD Presentations + Discussion (Block 7)                                          |
| 14:30-14:45   | Coffee break                                                                     |
| 14:45-16:15   | **Dr. Holger Finken**, German Academic Exchange Office (DAAD)  
  *DAAD Funding Opportunities for Academic Cooperation* |
| 16:15-18:00   | **Brainstorming Session: Nanophotonics**                                         |
Tuesday, September 9

09:00-10:30  **Session 9 – Nanoelectronics**  
Dr. Alexander Colsmann, Karlsruhe Institute of Technology  
*Advanced device architectures for printable organic semiconductor devices*  
Prof. Dr. Hideaki Kasai, Osaka University  
*Surface as a Foundation to Realizing Designer Materials*

10:30-10:45  Coffee break

10:45-12:00  Dr. Wendel Wohlleben, BASF SE, GMC - Material Physics  
*Big challenges love small dimensions: Nanotechnology products and research*

12:00-13:00  Lunch break, KIT canteen (Line 6)

13:00-14:30  **Session 10 – Surfaces**  
Assist. Prof. Dr. Shinya Yoshida, Tohoku University Sendai  
*MEMS (Micro Electro Mechanical Systems) technology*  
Prof. Dr. Christof Wöll, Karlsruhe Institute of Technology  
*Epitaxial Growth of Nanoporous, Three-Dimensional Functional Frameworks: A Novel Approach for the Fabrication of Nanoparticle-Quasicrystals*

14:30-14:45  Coffee break

14:45-16:15  PhD Presentations + Discussion (Block 8)

16:15-18:00  Brainstorming Session: Surfaces

18:00-20:00  Farewell Dinner  
Heinrich Hertz House for Guest Lecturers (Engesserstrasse 3)

Wednesday, September 10

09:00-10:30  **Session 11 – Surfaces**  
Prof. Dr. Michael Zharnikov, Heidelberg University  
*Current challenges in molecular electronics: molecular switches and charge transfer dynamics*  
Prof. Dr. Satoshi Hamaguchi, Osaka University  
*Plasma-surface interaction for advanced semiconductor processing*

10:30-10:45  Coffee break

10:45-12:00  Discussion & Prizes

Departure of participants

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