

The 8th Japan-France Workshop on Nanomaterials

June 15-17th, 2009

Sponsored by

National Institute for Materials Science (NIMS), Japan

International Center for Materials Nanoarchitectonics (MANA), Japan

Centre National de la Recherche Scientifique (CNRS), France

Program

Monday, June 15th, 2009

- 9:00 – 9:15 Opening address
 Prof. **Teruo KISHI**, NIMS president
 Prof. **Jean ETOURNEAU**, ICMCB-CNRS
- 9:15 – 9:40 Overview of Japanese/French nanomaterials research
 Prof. **Yoshio BANDO**, MANA chief operating officer
 Prof. **Marc DRILLON**, IPCMS-CNRS
 followed by group photo

SESSION 1

- 9:40 – 10:00 Nanoionics: A new frontier of solid state ionics
 Prof. **Shu YAMAGUCHI**, University of Tokyo
- 10:00 – 10:20 Spin transfer microwave emission in MgO based magnetic tunnel junctions: From uniform precession to magnetic vortex dynamics
 Dr. **Vincent CROS**, CNRS/THALES
- 10:20 – 10:40 Recent progress in transparent amorphous oxide semiconductors (TAOS) and their thin film transistor application: Can TAOS replace for silicon?
 Prof. **Hideo HOSONO**, Tokyo Institute of Technology
- 10:40 – 10:50 Discussion
- 10:50 – 11:00 Coffee break

SESSION 2

- 11:00 – 11:20 Pico-material characterization by aberration corrected electron imaging
 Prof. **Kunio TAKAYANAGI**, Tokyo Institute of Technology
- 11:20 – 11:40 BEEM investigation of some spintronics heterostructures
 Prof. **Pascal TURBAN**, University of Rennes I
- 11:40 – 12:00 Boron nitride and carbon nanotube mechanics and electronics as revealed by *in-situ* TEM
 Dr. **Dmitri GOLBERG**, MANA-NIMS
- 12:00 – 12:10 Discussion
- 12:10 – 13:20 Lunch

SESSION 3

- 13:20 – 13:40 Synthesis of new layered anion-exchangeable hydroxides
 Prof. **Takayoshi SASAKI**, MANA-NIMS
- 13:40 – 14:00 Nanostructured Si-based materials for 3rd generation photovoltaic solar cells
 Prof. **Alain FAVE**, INSA/LYON

- 14:00 – 14:20 Electrochemical fabrication of one-dimensional nanomaterials for lithium-ion microbatteries
Prof. **Thierry DJENIZIAN**, University of Provence
- 14:20 – 14:30 Discussion
- 14:30 – 14:40 Coffee break

SESSION 4

- 14:40 – 15:00 Solid-state nano-protonics
Prof. **Hiroshi KITAGAWA**, Kyushu University
- 15:00 – 15:20 Liquid crystal polymeromes and their bursting
Dr. **Min-hui LI**, CNRS/Paris
- 15:20 – 15:40 Nanostructured functional liquid-crystalline materials
Prof. **Takashi KATO**, University of Tokyo
- 15:40 – 15:50 Discussion
- 15:50 – 16:00 Coffee break

SESSION 5

- 16:00 – 16:20 Precision polymer synthesis for future polymer materials
Prof. **Mitsuo SAWAMOTO**, Kyoto University
- 16:20 – 16:40 Ion conducting solid electrolytes based on nanostructured polymers
Prof. **Denis BERTIN**, University of Provence
- 16:40 – 16:50 Discussion
- 16:50 – 17:10 Folding and assembly of organic nanomolecules
Prof. **Ivan HUC**, University of Bordeaux
- 17:10 – 17:30 Toward the development of responsive dynamic combinatorial nano-systems
Prof. **Nicolas GIUSEPPONE**, University Louis Pasteur of Strasbourg
- 17:30 – 17:40 Discussion
- 19:00 – 21:00 Banquet

Tuesday, June 16th, 2009

SESSION 6

- 9:00 – 9:20 Functionalizing Silicon Carbide & Graphene Surfaces with Organic Molecules
Dr. **Andrew MAYNE**, CNRS/ORSAY
- 9:20 – 9:40 Molecule-quantum logic gates and theory of atomic scale interconnects for the MANA project
Prof. **Xavier BOUJU**, CNRS/TOULOUSE

- 9:40 – 10:00 Molecular switches and single-molecule contacts explored by a scanning tunnelling microscope
Prof. **Jörg KRÖGER**, University of Kiel/Germany
- 10:00 – 10:10 Discussion
- 10:10 – 10:20 Coffee break

SESSION 7

- 10:20 – 10:40 Highly ordered interfacial arrangements of atom and molecules for electrochemical and photoelectrochemical energy conversion
Prof. **Kohei UOSAKI**, Hokkaido University
- 10:40 – 11:00 Designed nanostructures for catalytic applications
Prof. **Regina PALKOVITS**, MPI/Germany
- 11:00 – 11:20 Experiment integrated multi-level computational chemistry: Present states and future prospects
Prof. **Akira MIYAMOTO**, Tohoku University
- 11:20 – 11:30 Discussion
- 11:30 – 11:50 Low-energy multicharged-ion nanobeams
Prof. **Amine CASSIMI**, CIMAP-CIRIL
- 11:50 – 12:10 New organic lasers based on self doubling emission
Prof. **Alain FORT**, University of Strasbourg
- 12:10 – 12:20 Discussion
- 12:20 – 13:30 Lunch

SESSION 8

- 13:30 – 13:50 Quantum nanostructured oxide thermoelectrics
Prof. **Kunihito KOUMOTO**, Nagoya University
- 13:50 – 14:10 Screening mechanism in polar discontinuity at hetero-interface of perovskite oxides
Prof. **Kiyoyuki TERAOKA**, JAIST
- 14:10 – 14:30 Playing with coordination nano-objects: Toward multifunctionality on the nanoscale
Prof. **Talal MALLAH**, University Paris-Sud 11
- 14:30 – 14:40 Discussion
- 14:40 – 15:00 Use of metal atom clusters as building blocks for the design of nanomaterials
Dr. **Stéphane CORDIER**, UMR-CNRS
- 15:00 – 15:20 Photo-induced switching of spin crossover molecular materials: From bulk to nanoparticles
Prof. **Claude LECOMTE**, University Henri Poincaré
- 15:20 – 15:30 Discussion

15:30 – 15:40 Coffee break

SESSION 9

- 15:40 – 16:05 Short presentation for posters (part 1)
- “Low-temperature proton conduction in nanograin ceria”
Prof. **Hitoshi TAKAMURA**, Tohoku University
 - “Synthesis and catalytic properties of copper-palladium ordered alloy nanoparticles”
Prof. **Miho YAMAUCHI**, Hokkaido University
 - “Triple phase boundary constructed in nanospaces”
Dr. **Ichizo YAGI**, AIST
 - “Design of nanoarchitected metals -- Beyond silica: New trend of mesoporous materials --”
Dr. **Yusuke YAMAUCHI**, MANA-NIMS
 - “Nanostructure control in organic photovoltaic cells”
Prof. **Keisuke TAJIMA**, University of Tokyo
- 16:05 – 16:30 Short presentation for posters (part 2)
- “Nanostructured manganese oxides from a low temperature solution process”
Dr. **Jonathan P. HILL**, MANA-NIMS
 - “Programmable self-assembly of metal complexes”
Prof. **Kentaro TANAKA**, Nagoya University
 - “Magneto-responsive hybrid hollow capsules formed with polyelectrolytes, lipid bilayers, and Fe_3O_4 nanoparticles”
Prof. **Kiyofumi KATAGIRI**, Nagoya University
 - “Polythiophene polyrotaxanes”
Dr. **Taichi IKEDA**, ONC-NIMS
 - “Transfer of a single carbon fullerene at nano-gap”
Prof. **Yoshifumi OSHIMA**, Tokyo Institute of Technology
- 16:30 – 17:00 Short presentation for posters (part 3)
- “First-principle molecular dynamics simulations of chemical reactions at water/metal interfaces”
Prof. **Yoshitada MORIKAWA**, Osaka University
 - “Ab initio MD study on redox reactions on semiconductor/water interface”
Dr. **Yoshitaka TATEYAMA**, MANA-NIMS
 - “Titanium dioxide-based transparent spintronics”
Prof. **Tomoteru FUKUMURA**, Tohoku University
 - “Synthesis, luminescence and field-emission properties of n-doped ZnO nanobullets”
Dr. **Ujjal K. GAUTAM**, MANA-NIMS
 - “Crystal structure and superconductivity of a possible higher- T_c superconductor AeFeAsF ($\text{Ae} = \text{Ca}, \text{Sr}$)”
Dr. **Takatashi NOMURA**, Tokyo Institute of Technology
 - “Nonvolatile memory effect in heterostructured nanowires of transition metal oxides”
Dr. **Kazuki NAGASHIMA**, Osaka University
- 17:00 – 19:00 Poster presentation

Wednesday, June 17th, 2009

SESSION 10

- 9:00 – 9:20 Coherent control of electron charge, transmission phase shift and electron spin
Prof. **Christopher BÄUERLE**, CNRS/GRENOBLE
- 9:20 – 9:40 Bistable nanowire for micromechanical memory
Prof. **Benoît CHARLOT**, University of Montpellier 2
- 9:40 – 10:00 Metal oxide nanowires: Synthesis, properties and non-volatile memory applications
Prof. **Takeshi YANAGIDA**, Osaka University
- 10:00 – 10:10 Discussion
- 10:10 – 10:20 Coffee break

SESSION 11

- 10:20 – 10:40 Study of amoeboid cell migration and adhesion thanks to dedicated microfluidic tools
Prof. **Charlotte RIVIÈRE**, University Claude Bernard Lyon 1
- 10:40 – 11:00 Ultrafast permeation of water through nanometer-thick protein membranes
Dr. **Izumi ICHINOSE**, ONC-NIMS
- 11:00 – 11:20 Electron Hopping between microorganism and inorganic nanomaterials: Drastic increment of current density in microbial fuel cell
Prof. **Kazuhito HASHIMOTO**, University of Tokyo
- 11:20 – 11:30 Discussion
- 11:30 – 11:50 Concluding remarks
Prof. **Yoshio BANDO**, MANA chief operating officer
Prof. **Jean ETOURNEAU**, ICMCB-CNRS
- 11:50 – 13:00 Lunch
- 13:00 – 15:00 Excursion and optional activity
MANA Lab-tour for French delegates
Optional meeting for young Japanese presenters