

## PROGRAM

### MANA International Symposium 2016

9<sup>th</sup> March - 11<sup>th</sup> March, 2016

Venue: *Tsukuba International Congress Center EPOCHAL TSUKUBA*

(Address: 2-20-3, Takezono, Tsukuba, Ibaraki, 305-0032, Japan)

#### **March 8<sup>th</sup>**

18:00 - Reception

#### **March 9<sup>th</sup>**

#### **Opening**

(Chair: Yoshio Bando)

9:00 - 9:10 Opening Address

**Kazuhito Hashimoto** (President of NIMS)

9:10 - 9:15 Greetings

**Masami Watanabe** (Director, Basic Research Promotion Division, Research Promotion Bureau, MEXT)

9:15 - 9:25 Greetings

**Toshio Kuroki** (Program Director of WPI Program;  
Senior Advisor, Research Center for Science Systems, JSPS)

9:25 - 9:35 Greetings

**Gunzi Saito** (Program Officer of WPI Program; Professor, Meijo University)

9:35 - 9:55 Outline of MANA

**Masakazu Aono** (Director-general of MANA, NIMS)

#### **Special Lecture 1**

(Chair: Masakazu Aono)

10:00 - 10:40 Surface attophysics **(Invited)**

**Pedro Miguel Echenique** (President, Donostia International Physics Center, Spain)

10:40 - 10:50 *Group Photograph at the Main Entrance*

10:50 - 11:10 *Coffee Break*

#### **S-1 Nano-Power / Nano-Materials 1**

(Chair: Louis Schlapbach, Jinhua Ye)

11:10 - 11:40 Hierarchical inorganic assemblies for the photocatalytic reduction of CO<sub>2</sub> by H<sub>2</sub>O **(Invited)**

**Heinz Frei** (Professor, Lawrence Berkeley National Laboratory, USA)

11:40 - 12:10 Energy transfer in elementary reactive processes at metal surfaces **(Invited)**

**Ricardo Díez Muiño** (Director, Donostia International Physics Center, Spain)

- 12:10 - 12:40 Development of reversible type solid oxide fuel cells and application for metal-air battery  
**Tatsumi Ishihara** (Professor, WPI-I<sup>2</sup>CNER, Kyushu University) **(Invited)**
- 12:40 - 12:55 Development of high speed transistor channel using Ge/Si core-shell nanowires  
**Naoki Fukata** (Group Leader, MANA, NIMS)
- 12:55 - 14:00 *Lunch*

**S-2 Nano-Materials / Nano-System 1**

(Chair: Thomas A. Jung, James K. Gimzewski)

- 14:00 - 14:30 Challenges toward ultrahigh-density non-volatile memory **(Invited)**  
**Shinji Yuasa** (Director, Spintronics Research Center, AIST)
- 14:30 - 15:00 Spectral weight transfer and quasi particle interference in a hole-doped Mott insulator on a triangular surface lattice. **(Invited)**  
**Hanno H. Weitering** (Professor, University of Tennessee, USA)
- 15:00 - 15:15 Development of high-dielectric constant thin film materials for next-generation nanoelectronics  
**Takahiro Nagata** (MANA Scientist, NIMS)
- 15:15 - 15:35 *Coffee Break*

**S-3 Nano-Materials / Nano-System 2**

(Chair: Hanno H. Weitering, Katsuhiko Ariga)

- 15:35 - 16:05 Supramolecular architectures at surfaces: Investigating structure, electron and spin states **(Invited)**  
**Thomas A. Jung** (Professor, Paul Scherrer Institute, Switzerland)
- 16:05 - 16:35 Single-molecule carbon nanotubes, nanoribbons, and a new form of carbon **(Invited)**  
**Kenichiro Itami** (Director, WPI-ITbM, Nagoya University)
- 16:35 - 17:05 Supramolecular functional liquid-crystalline assemblies **(Invited)**  
**Takashi Kato** (Professor, University of Tokyo)
- 17:05 - 17:20 Chemistry of novel functional liquids  
**Takashi Nakanishi** (MANA Independent Scientist, NIMS)
- 17:20 - 17:30 *Break*
- 17:30 - 19:30 **Poster Sessions 1**

**March 10<sup>th</sup>**

**Special Lecture 2**

(Chair: Masakazu Aono)

9:00 - 9:40 Energy efficient computing by redox-based memristive oxide elements **(Invited)**  
**Rainer Waser** (Professor, Electronic Materials Research Laboratory, Germany)

**S-4 Superconductivity 1**

(Chair: Tetsuo Hanaguri, Yoshihiko Takano)

9:45 - 10:15 Superconductivity of thin films, surfaces and interfaces of materials with strong electronic correlations

**Hilbert v. Löhneysen** (Professor, Karlsruhe Institute of Technology, Germany) **(Invited)**

10:15 - 10:35 Topological superconductor as a platform for realizing Majorana fermion

**Xiao Hu** (MANA PI, NIMS)

10:35 - 10:50 Surface sensitive atomic-layer superconductors

**Takashi Uchihashi** (MANA Scientist, NIMS)

10:50 - 11:20 *Coffee Break*

**S-5 Superconductivity 2**

(Chair: Hilbert v. Löhneysen, Xiao Hu)

11:20 - 11:50 Revealing electronic states of unconventional superconductors by spectroscopic-imaging STM

**Tetsuo Hanaguri** (Team Leader, RIKEN) **(Invited)**

11:50 - 12:05 Insulator to metal transition and superconductivity in diamond

**Yoshihiko Takano** (Group Leader, Superconducting Wires Unit, NIMS)

12:05 - 12:20 Pursuing high  $T_c$  superconductivity on the basis of solid state ionics

**Takashi Tsuchiya** (Scientist, MANA, NIMS)

12:20 - 14:30 *Lunch / Poster Sessions 2 (13:30-14:30 Core time)*

**S-6 Nano-Power / Nano-Materials 2**

(Chair: Heinz Frei, Hidenori Noguchi)

14:30 - 15:00 Photocatalytic reduction of CO<sub>2</sub> using metal complexes and semiconductors **(Invited)**

**Osamu Ishitani** (Professor, Tokyo Institute of Technology)

15:00 - 15:20 Nature-inspired reaction-environment modulation for efficient solar fuel production

**Jinhua Ye** (MANA PI, NIMS)

15:20 - 15:35 Theoretical study on surface and ion migration of perovskite materials in PSC

**Yoshitaka Tateyama** (Group Leader, MANA, NIMS)

15:35 - 15:50 Nonlinear spectroscopy to probe electronic state at solid/liquid interface  
**Hidenori Noguchi** (MANA Scientist, NIMS)

15:50 - 16:10 *Coffee Break*

**S-7 Nano-Materials / Nano-Systems 3** (Chair: Ricardo Díez Muiño, Toyohiro Chikyo)

16:10 - 16:40 2D crystals for smart life **(Invited)**

**Kaustav Banerjee** (Professor, UC Santa Barbara, USA)

16:40 - 17:10 Fundamental understanding of ferroelectricity in HfO<sub>2</sub>-based materials using epitaxial films and their applications to real devices **(Invited)**

**Hiroshi Funakubo** (Professor, Tokyo Institute of Technology)

17:10 - 17:25 High-*k* ferroelectricity at the 2D limit

**Minoru Osada** (MANA Associate PI, NIMS)

17:25 - 17:40 Living supramolecular polymerization

**Kazunori Sugiyasu** (Senior Researcher, Polymer Materials Unit, NIMS)

18:00 - *Banquet*

### **March 11<sup>th</sup>**

**Special Lecture 3** (Chair: Masakazu Aono)

9:00 - 9:40 Towards adaptive functional materials and nanoarchitectures

**Jean-Marie Lehn** (Nobel Laureate in Chemistry 1987, France) **(Invited)**

9:40 - 10:00 *Coffee Break*

**S-8 Nano-Life 1** (Chair: Antonios G. Mikos, Guoping Chen)

10:00 - 10:30 Strategies for fabricating the next generation bone graft materials: hydrogels, additives and 3D printing

**Kathryn M. McGrath** (Professor, MacDiarmid Institute, New Zealand) **(Invited)**

10:30 - 11:00 Nano-scaled and functional polymeric particles for nanomedicine molecular science

**Kazuhiko Ishihara** (Professor, University of Tokyo) **(Invited)**

11:00 - 11:30 The new bioimaging method using fluorescence diamond nanoparticles **(Invited)**

**Yoshie Harada** (Professor, WPI-iCeMS, Kyoto University)

- 11:30 - 11:50 Boron nitride nanotubes as vehicles for intracellular delivery of fluorescent drugs and probes  
**Francoise Winnik** (Professor, Université de Montréal, MANA Satellite PI)
- 11:50 - 12:05 Nanomechanical sensor (MSS) towards mobile olfaction  
**Genki Yoshikawa** (MANA Independent Scientist, NIMS)
- 12:05 - 13:05 *Lunch*

**S-9 Nano-Life 2**

(Chair: Kathryn M. McGrath, Francoise Winnik)

- 13:05 - 13:35 Injectable hydrogels for growth factor and stem cell delivery in tissue engineering  
**Antonios G. Mikos** (Louis Calder Professor, Rice University, USA) **(Invited)**
- 13:35 - 14:05 Quantitative physical tools for optimizing stem cell therapy of myeloid leukemia **(Invited)**  
**Motomu Tanaka** (Professor, Heidelberg University/WPI-iCeMS, Kyoto University)
- 14:05 - 14:20 Enhanced interfacial bonding strength of hydrophobically-modified gelatin-based surgical adhesives  
**Tetsushi Taguchi** (MANA Scientist, NIMS)
- 14:20 - 14:50 Poster Award Ceremony and Closing Remarks  
**Yoshio Bando** (MANA Chief Operating Officer, NIMS)