

PROGRAM

MANA International Symposium 2017

28th February - 3rd March, 2017

Venue: *Tsukuba International Congress Center EPOCHAL TSUKUBA*

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

February 27th

18:00 - Reception

February 28th

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

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

9:25 - 9:55 Outline of MANA

Masakazu Aono (Director-general of MANA, NIMS)

9:55 - 10:05 *Group Photograph at the Main Entrance*

10:05 - 10:25 *Coffee Break*

Special Event: Day of Nanoarchitectonics

(Chair: Tomonobu Nakayama, James K. Gimzewski, Mark E. Welland)

10:25 - 10:35 Opening Remarks

Masakazu Aono (Director-general of MANA, NIMS)

10:35 - 10:45 Prologue

Mark E. Welland (Head of Electrical Engineering at Department of Engineering, University of Cambridge)

10:45 - 11:25 From extrusion to bespoke placement of building materials

Greg Lynn (Professor, University of California Los Angeles) **(Invited)**

11:25 - 12:05 Software architecture

Alastair Beresford (Senior Scientist, University of Cambridge) **(Invited)**

12:05 - 12:45 Natural Computing Paradigm: Amoeba-inspired Architectures and their Applications

Masashi Aono (Associate PI, WPI-ELSI, Tokyo Institute of Technology) **(Invited)**

12:45 - 12:55 Epilogue
James K. Gimzewski (MANA Satellite PI, University of California Los Angeles)

12:55 - 14:30 *Lunch*

S-1 Nano-Power 1 (Chair: Thierry Caillat, Jinhua Ye)

14:30 - 15:00 Visible and near-infrared plasmon-induced photoenergy conversion systems

Hiroaki Misawa (Professor, Hokkaido University) **(Invited)**

15:00 - 15:30 Complex hydrides for advanced energy device research

Shin-ichi Orimo (Professor, Tohoku University) **(Invited)**

15:30 - 15:50 Applications of oxides and nitrides for plasmonic energy transduction

Tadaaki Nagao (MANA Group Leader, NIMS)

15:50 - 16:10 *Coffee Break*

S-2 Nano-Theory 1 (Chair: Dario Alfe, David Bowler)

16:10 - 16:40 Topological data analysis: a tool detecting hidden order in materials

Kazuto Akagi (Associate Professor, AIMR, Tohoku University) **(Invited)**

16:40 - 17:10 The bulk photovoltaic effect in polar oxides for robust and efficient solar energy harvesting

Andrew M. Rappe (Professor, University of Pennsylvania) **(Invited)**

17:10 - 17:30 Computational design of photofunctional materials

Naoto Umezawa (MANA Independent Scientist, NIMS)

March 1st

S-3 Nano-Materials 1 (Chair: Toshiaki Enoki, Richard Kaner)

9:00 - 9:30 Inorganic graphene analogues **(Invited)**

C.N.R. Rao (Honorary President, Jawaharlal Nehru Centre for Advanced Scientific Research)

9:30 - 10:00 Large area growth and applications of 2-D MoS₂

Kian Ping Loh (Professor, National University of Singapore) **(Invited)**

10:00 - 10:30 Functional mixed anion compounds - magnetism, catalysis and environmental remediation

Hiroshi Kageyama (Professor, Kyoto University) **(Invited)**

10:30 - 10:50 Tailored design of crystalline nanoporous materials

Yusuke Yamauchi (Professor, University of Wollongong / MANA PI, NIMS)

10:50 - 11:10 *Coffee Break*

S-4 Nano-System 1

(Chair: Ernst Meyer, Chris McConville)

11:10 - 11:40 Exotic, low dimensional forms of silicon

Guy Le Lay (Professor, Aix-Marseille University) **(Invited)**

11:40 - 12:00 Photochromic organic field-effect transistor: Molecules, device properties and optical drawing of circuits

Yutaka Wakayama (MANA Group Leader, NIMS)

12:00 - 12:30 Dissecting design principal of biological clock by using chemical tools

Tsuyoshi Hirota (Designated Associate Professor, Co-PI, ITbM, Nagoya University) **(Invited)**

12:30 - 12:50 Atomic switch networks as a biomorphic architecture for cognitive technology

James K. Gimzewski (MANA Satellite PI, University of California Los Angeles)

12:50 - 13:50 *Lunch*

S-5 Nano-Life 1

(Chair: Molly Shoichet, Toshihiro Akaike)

13:50 - 14:20 Processing of elastomers for cell-scale architectural control in soft tissue applications

William Wagner (Professor, University of Pittsburgh) **(Invited)**

14:20 - 14:50 Control of pDNA packaging by block copolymers and application as gene delivery system

Kensuke Osada (Project Associate Professor, University of Tokyo) **(Invited)**

14:50 - 15:20 Nano-bio architectures based on DNA conjugate chemistry

Mizuo Maeda (Chief Scientist, RIKEN) **(Invited)**

15:20 - 15:40 Antioxidative nanomedicine developed in MANA project

Yukio Nagasaki (MANA Satellite PI, University of Tsukuba)

15:40 - 15:50 *Break*

15:50 - 17:20 **Poster Presentations**

(Chair: Tomonobu Nakayama)

17:20 - 17:40 *Coffee Break*

17:40 - 18:40 **Poster Sessions 1**

19:00 – 21:00 *Banquet*

March 2nd

S-6 Nano-Systems 2

(Chair: Guy Le Lay, Tomonobu Nakayama)

- 9:00 - 9:30 Electronic structure and properties of transparent conducting oxide semiconductors
 Chris McConville (Professor, RMIT University) **(Invited)**
- 9:30 - 10:00 Force microscopy as a local tool to investigate mechanism of friction
 Ernst Meyer (Professor, University of Basel) **(Invited)**
- 10:00 - 10:30 Transport network in a micro-organism
 Toshiyuki Nakagaki (Professor, RIES, Hokkaido University) **(Invited)**
- 10:30 - 10:50 Atomic scale quantum hamiltonian boolean logic gates
 Christian Joachim (MANA Satellite PI, CNRS)
- 10:50 - 11:10 *Coffee Break*

S-7 Nano-Materials 2

(Chair: Hiroshi Kageyama, Yoshio Bando)

- 11:10 - 11:40 Hybrid organic inorganic perovskite halides
 Anthony K. Cheetham (Professor, University of Cambridge) **(Invited)**
- 11:40 - 12:10 Exploring the synthesis and applications of graphene
 Richard Kaner (Professor, University of California Los Angeles) **(Invited)**
- 12:10 - 12:40 Our scientific challenges with MANA
 Takuzo Aida (Professor, University of Tokyo) **(Invited)**
- 12:40 - 13:00 Piezotronics and piezo-phototronics
 Zhong Lin Wang (MANA Satellite PI, Georgia Institute of Technology)
- 13:00 - 14:00 *Lunch*
- 14:00 - 15:30 **Poster Sessions 2**
- 15:30 - 15:50 *Coffee Break*

S-8 Nano-Theory 2

(Chair: Andrew M. Rappe, Taizo Sasaki)

- 15:50 - 16:20 Chemical equilibrium at the earth's core-mantle boundary
 Dario Alfe (Professor, University College London) **(Invited)**
- 16:20 - 16:50 Structure and properties of materials in the deep earth
 Toshiaki Iitaka (Senior Research Scientist, RIKEN) **(Invited)**
- 16:50 - 17:10 Building bridges: linking length scales with linear scaling DFT, and bringing together experiment and theory

David Bowler (MANA Satellite PI, University College London)

March 3rd

S-9 Nano-Power 2

(Chair: Louis Schlapbach)

9:00 - 9:30 Skutterudite-based thermoelectric technology for integration into a proposed eMMRTG for space power applications

Thierry Caillat (NASA) **(Invited)**

9:30 - 10:00 TiS₂/Organic intercalation complexes for wearable thermoelectrics **(Invited)**

Kunihito Koumoto (Fellow, Toyota Physical and Chemical Research Institute)

10:00 - 10:20 Utilizing nanotechnology and novel materials to develop viable thermoelectric materials

Takao Mori (MANA PI, NIMS)

10:20 - 10:40 *Coffee Break*

S-10 Nano-Life 2

(Chair: Kensuke Osada, Guoping Chen)

10:40 - 11:10 Nanomaterials in regenerative medicine

Molly Shoichet (Professor, University of Toronto) **(Invited)**

11:10 - 11:40 Microtubule mechanics, self-repair and rejuvenation

Manuel Thery (Professor, Hospital Saint Louis) **(Invited)**

11:40 - 12:00 Nanostickers for cells: a model study using cell-nanoparticles hybrid aggregates

Francoise Winnik (MANA Satellite PI, University of Montreal)

12:00 - 12:20 Photoactivatable surfaces for cell migration study and drug screening

Jun Nakanishi (MANA Group Leader, NIMS)

Closing

12:20 - 12:50 Poster Award Ceremony and Closing Remarks

Yoshio Bando (MANA Chief Operating Officer, NIMS)