

8th International Workshop on Nanostructures & Nanoelectronics

**Laboratory for Nanoelectronics and Spintronics
Research Institute of Electrical Communication
Tohoku University**

Organized by

**Research Institute of Electrical Communication
Tohoku University**

Co-Organized by

Nano-Spin Engineering Seminar

Cooperative Research Projects

Information Biotronics Seminar

Cooperative Society

**CREST “Construction of ion and electron nano-channels
in super-resistive lipid bilayers”, JST**

March 6-7, 2017

Sendai, Japan

8th International Workshop on Nanostructures & Nanoelectronics

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**Site: Laboratory for Nanoelectronics and Spintronics, Research
Institute of Electrical Communication, Tohoku University,
Sendai, Japan**

Organizer:

Symposium Chairs

Michio Niwano, Tohoku Univ.

Ayumi Hirano-Iwata, Tohoku Univ.

Program Committee

Ayumi Hirano-Iwata, Tohoku Univ.

Organizing Committee

Ayumi Hirano-Iwata, Tohoku Univ.

Teng Ma, Tohoku Univ.

Daisuke Tadaki, Tohoku Univ.

Program

March 6 (Monday)

Room: 4F, Conference Room, *Laboratory for Nanoelectronics and Spintronics*

9:00 ~ 9:05 Opening Remarks
Michio Niwano (Research Institute of Electrical Communication, Tohoku University, Japan)

(Chair: Ayumi Hirano-Iwata)

9:05 ~ 9:20 History of the workshop
Michio Niwano (Research Institute of Electrical Communication, Tohoku University, Japan)

9:20 ~ 10:00 Self-organized TiO₂ nanotube arrays: Latest features and applications
Patrik Schmuki (Department of Materials Science WW-4, LKO, University of Erlangen-Nuremberg, Martensstrasse 7, 91058 Erlangen, Germany)

10:00 ~ 10:30 A Novel Structure for Membrane Devices Consisting of Atomic and Molecular Sheets and Two-Dimensional Nanoparticle-Arrays
Toshio Ogino, Naotoshi Sakaguchi, Ryosuke Kimura, Akiko Isobe, Daisuke Mashiyama, Yasuo Kimura and Ayumi Hirano-Iwata (¹Yokohama National University, ²Tokyo University of Technology, ³Tohoku University)

10:30 ~ 10:40 Coffee break

(Chair: Patrik Schmuki)

10:40 ~ 11:20 The impact of electrolyte composition on electrochemical detection of nanoparticles
Kay Krause¹, Pedro G. Figueiredo², Leroy Grob², Philipp Rinklin², and Bernhard Wolfrum^{1,2} (¹Institute of Bioelectronics (PGI-8/ICS-8), Forschungszentrum Jülich, 52425 Jülich, Germany. ²Neuroelectronics, Munich School of Bioengineering, Department of Electrical and Computer Engineering, Technical University of Munich (TUM), Germany)

11:20 ~ 11:50 Optical pump-probe STM for nanoscale science
Hidemi Shigekawa (Faculty of pure and applied sciences, University of Tsukuba, Japan)

11:50 ~ 13:00 Lunch

(Chair: Bernhard Wolfrum)

- 13:00 ~ 13:40 Nanoporous Lipid Membranes: Optical and Electrochemical Sensing Platforms
Craig A. Aspinwall (Department of Chemistry and Biochemistry, University of Arizona, Tucson, USA)
- 13:40 ~ 14:10 Microfabrication techniques for ion-channel studies (tentative)
Ayumi Hirano-Iwata (Advanced Institute for Materials Research, Tohoku University, Japan)
- 14:10 ~ 14:20 Coffee break
- (Chair: Teng Ma)
- 14:20 ~ 14:50 Fabrication of self-organized microstructures of GaAs using sphere lithography and wet etching
Sachiko Ono and Hidetaka Asoh (Department of Applied Chemistry, Faculty of Advanced Engineering, Kogakuin University, Japan)
- 14:50 ~ 15:20 Emerging Functions of Nanostructured Silicon
Nobuyoshi Koshida (Graduate School of Engineering, Tokyo University of Agri. & Tech., Japan)
- 15:20 ~ 15:40 Noble-Metal-Free Photocatalytic Hydrogen Evolution Activity: Defect Engineering in TiO₂ Nanotubes
Xuemei Zhou (Department of Materials Science WW-4, LKO, University of Erlangen-Nuremberg, Germany)
- 15:40 ~ 15:50 Coffee break
- (Chair: Daisuke Tadaki)
- 15:50 ~ 16:20 Numerical Study on Stochastic Resonance in a Single-Electron Hysteretic Inverter
Yoshinao Mizugaki and Tran Thi Thu Huong (The University of Electro-Communications, Japan)
- 16:20 ~ 17:10 Development of the Nerve Cell Network High Throughput Screening Devices
Tsuneo Urisu (Nagoya University, Japan)
- 17:10 ~ 17:30 Room-temperature atomic layer deposition for anticorrosion coatings
K. Kanomata, M. Ishikawa, M. Miura, B. Ahmmad, S. Kubota, F. Hirose (Graduate School of Science and Engineering, Yamagata University, Japan)

March 7 (Tuesday)

Room: 4F, Conference Room, *Laboratory for Nanoelectronics and Spintronics*

(Chair: Craig A. Aspinwall)

- 9:00 ~ 9:40 Sub-cellular imaging of arrayed stem cells
Maurits de Planque (Electronics and Computer Science & Institute for Life Sciences, University of Southampton, United Kingdom)
- 9:40 ~ 10:10 The design of bilayer lipid membranes as a platform for channel-based biosensing
Masao Sugawara (College of Humanities and Sciences, Nihon University, Japan)
- 10:10 ~ 10:40 Nanogap-junction with a fluid lipid bilayer for selective biosensing
Kenichi Morigaki (Kobe University, Japan)
- 10:40 ~ 10:50 Coffee break

(Chair: Maurits de Planque)

- 10:50 ~ 11:20 Room-temperature atomic layer deposition for nano particles and their applications to electronic devices
F. Hirose, K. Kikuchi, K. Kanomata, M. Miura, B. Ahmmad, S. Kubota (Graduate School of Science and Engineering, Yamagata University, Japan)
- 11:20 ~ 11:50 Effect of chemical stimulation to morphology of artificial cell membrane systems
Ryugo Tero (Department of Environmental and Life Sciences, Toyohashi University of Technology, Japan)
- 11:50 ~ 12:20 Artificial lipid bilayers: from single molecule imaging to drug screening
Saki Nomura¹, Minako Hirano², Hiroaki Yokota², Junya Ichinose¹ and Toru Ide¹
(¹Graduate School of Natural Science and Technology, Okayama University, ²The Graduate School for the Creation of New Photonics Industries, Japan)