

10th 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 Bionics Seminar**

Cooperative Society

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

**Division of Soft-Nanotechnology,
The Japan Society of Vacuum and Surface Science**

**March 6-7, 2019
Sendai, Japan**

10th International Workshop on Nanostructures & Nanoelectronics

March 6-7, 2019

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



Organizer:

Symposium Chairs

Ayumi Hirano-Iwata, Tohoku Univ.

Ryugo Tero, Toyohashi Univ. of Tech.



Program Committee

Ayumi Hirano-Iwata, Tohoku Univ.

Organizing Committee

Ayumi Hirano-Iwata, Tohoku Univ.

Ryugo Tero, Toyohashi Univ. of Tech.

Teng Ma, Tohoku Univ.

Daisuke Tadaki, Tohoku Univ.

Program

March 6 (Wednesday)

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

- 13:00 ~ 13:05 Opening Remarks
Ayumi Hirano-Iwata
(Advanced Institute for Materials Research / Research Institute of Electrical Communication, Tohoku University, Sendai, Japan)
- (Chair: Daisuke Tadaki)
- 13:05 ~ 13:50 Multi-pore resistive pulse sensing of microRNA
Maurits de Planque
(School of Electronics and Computer Science & Institute for Life Sciences, University of Southampton, Southampton, United Kingdom)
- 13:50 ~ 14:20 Patterned lipid bilayer combined with a nanometric gap structure as a versatile model of the biological membrane
Kenichi Morigaki^{1,2}
(¹Biosignal Research Center, Kobe University, Kobe, Japan, ²Graduate School of Agricultural Science, Kobe University, Kobe, Japan)
- 14:20 ~ 14:50 Impedance mapping of a cultured cell layer for spatiotemporal analysis of its barrier function
Ko-ichiro Miyamoto¹, Daisuke Suzuki², Carl Frederik Werner¹, and Tatsuo Yoshinobu^{1,2}
(¹Department of Electronic Engineering, Tohoku University, Sendai, Japan, ²Department of Biomedical Engineering, Tohoku University, Sendai, Japan)
- 14:50 ~ 15:20 Stable lipid bilayers formed in microfabricated silicon chips as a platform for novel biosensors
Ayumi Hirano-Iwata^{1,2}, Daichi Yamaura², Takafumi Deguchi², Miki Kato², Xingyao Feng², Daisuke Tadaki², Teng Ma¹, Hideaki Yamamoto¹, and Michio Niwano³
(¹Advanced Institute for Materials Research, Tohoku University, Sendai, Japan, ²Research Institute of Electrical Communication, Tohoku University, Sendai, Japan, ³Kansei Fukushi Research Institute, Tohoku Fukushi University, Sendai, Japan)
- 15:20 ~ 15:40 Coffee Break

(Chair: Patrik Schmuki)

- 15:40 ~ 16:10 Less-defect colloidal quantum dots: synthesis, optical properties and application in optoelectronic devices
F. Liu¹, Y. Zhang¹, C. Ding¹, S. Hayase², T. Toyoda¹, and Qing Shen¹
(¹Faculty of Informatics and Engineering, The University of Electro-Communications, Chofu, Tokyo, Japan, ²Faculty of Life Science and Systems Engineering, Kyushu Institute of Technology, Kitakyushu, Japan)
- 16:10 ~ 16:40 Dewetting of metal thin films on semiconductor surfaces: steering dewetting phenomena to design nanoscaled platforms for photocatalysis
Marco Altomare
(Department of Materials Science and Engineering, University of Erlangen-Nuremberg, Martensstraße 7, D-91058 Erlangen, Germany)
- 16:40 ~ 17:00 Back-contact structure for highly efficient perovskite solar cells
Teng Ma¹, Daisuke Tadaki², Michio Niwano³, and Ayumi Hirano-Iwata^{1,2}
(¹Advanced Institute for Materials Research, Tohoku University, Sendai, Japan, ²Research Institute of Electrical Communication, Tohoku University, Sendai, Japan, ³Kansei Fukushi Research Institute, Tohoku Fukushi University, Sendai, Japan)
- 18:00 ~ Banquet

March 7 (Thursday)

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

(Chair: Ryugo Tero)

9:00 ~ 9:45 Self-organized TiO₂ nanotube arrays : photoelectrochemical and photocatalytic applications

Patrik Schmuki

(Department of Materials Science WW-4, LKO, University of Erlangen-Nuremberg, Martensstraße 7, 91058 Erlangen, Germany)

9:45 ~ 10:05 Room temperature atomic layer deposition and its application to gas barrier coating

Fumihiko Hirose, K. Yoshida, M. Miura, K. Kanomata, B. Arima, S. Kubota

(Yamagata University, Yonezawa, Japan)

10:05 ~ 10:35 Single-electron devices fabricated using percolative connections of gold nanoparticles

Yoshinao Mizugaki¹, Masataka Moriya¹, Hiroshi Shimada¹, Kazuhiko Matsumoto¹,

Makoto Moribayashi¹, Tomoki Yagai¹, Ayumi Hirano-Iwata², and Fumihiko Hirose³

(¹The University of Electro-Communications, Chofu, Japan, ²Tohoku University, Sendai, Japan, ³Yamagata University, Yonezawa, Japan)

10:35 ~ 10:50 Coffee Break

(Chair: Maurits de Planque)

10:50 ~ 11:20 Cell-free translation system: a tool for producing proteinous nanomachines

Yuzuru Tozawa and Haruka Inoue

(Graduate School of Science and Engineering, Saitama University, Saitama, Japan)

11:20 ~ 11:50 Domain formation and lateral diffusion in lipid bilayer membranes on graphene oxide

Ryugo Tero, Yoshi Hagiwara, Kiyoshi Tsuzumi

(Toyohashi University of Technology, Toyohashi, Japan)

11:50 ~ 12:10 Microdomain formation in bilayer membrane consisting of completely miscible lipids

Melvin Wei Shern Goh¹, Ayumi Hirano-Iwata², Michio Niwano³, Ryugo Tero¹

(¹Toyohashi University of Technology, Toyohashi, Japan, ²Tohoku University, Sendai, Japan, ³Tohoku Fukushi University, Sendai, Japan)

12:10 ~ 12:30

Self-assembly of lipid membranes doped with organic molecules

Xingyao Feng¹, Teng Ma², Takafumi Deguchi¹, Ayumi Hirano Iwata^{1,2}

(¹Research Institute of Electrical Communication, Tohoku University, Sendai, Japan, ²Advanced Institute for Materials Research, Tohoku University, Sendai, Japan)