

13th International Workshop on Nanostructures & Nanoelectronics

Online

March 7-8, 2023

Organized by

**Research Institute of Electrical Communication
Tohoku University**

Co-Organized by

**Nano-Spin Engineering Seminar
Cooperative Research Projects
Information Biotronics Seminar**

Cooperative Society

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

13th International Workshop on Nanostructures & Nanoelectronics

【Online】



Scope:

The objective of the symposium is to provide a good opportunity to present latest topics related to fabrication of nanostructures and their application to fields of nanoelectronics and bioelectronics, and to discuss key aspects of them.

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 7 (Tuesday)

Red: Local time in Japan (JST)

Blue: GMT

[UK: GMT+0, Germany: GMT+1, China: GMT+8]

17:00 ~ 17:05 Opening Remarks

8:00 ~ 8:05 Ayumi Hirano-Iwata

(Research Institute of Electrical Communication / WPI-Advanced Institute for Materials Research / Graduate School of Biomedical Engineering, Tohoku University, Sendai, Japan)

(Chair: Ayumi Hirano-Iwata)

17:05 ~ 17:50 Single atom co-catalysts in photocatalytic H₂ generation

8:05 ~ 8:50 Patrik Schmuki

(Department of Materials Science WW-4, LKO, Friedrich-Alexander University of Erlangen-Nuremberg, Erlangen, Germany)

17:50 ~ 18:15 Nanothick metal oxide channel thin film transistors and their application as gas and

8:50 ~ 9:15 UV sensing

Fumihiko Hirose

(Graduate School of Science and Engineering, Yamagata University, Yonezawa, Yamagata, Japan)

18:15 ~ 18:35 Break

9:15 ~ 9:35

(Chair: Daisuke Tadaki)

18:35 ~ 19:05 Substrate-supported photosynthetic model thylakoid membrane

9:35 ~ 10:05 Yuka Kusunoki¹, Daisuke Takagi², Seiji Akimoto³, Sophie A. Meredith⁴, Ashley M. Hancock⁴, Stephen D. Evans⁴, Peter G. Adams⁴, Kenichi Morigaki^{1,5}

(¹Graduate School of Agricultural Science, Kobe University, Kobe, Japan, ²Faculty of Agriculture, Setsunan University, Hirakata, Osaka, Japan, ³Graduate School of Science, Kobe University, Kobe, Japan, ⁴School of Physics and Astronomy, University of Leeds, Leeds, UK, ⁵Biosignal Research Center, Kobe University, Kobe, Japan)

- 19:05 ~ 19:30** Fluorescence single molecule tracking for molecular behaviors at interfaces
10:05 ~ 10:30 between solid surfaces and organic solvents
Yui Matsushita¹, Satoki Kubota², Takuya Matsumoto², Ken-ichi Amano³,
Tomoko Hirayama⁴, Hiroshi Onishi^{2,5}, Ryugo Tero¹
(¹Toyohashi University of Technology, Toyohashi, Japan, ²Kobe University, Kobe,
Japan, ³Meijo University, Nagoya, Japan, ⁴Kyoto University, Kyoto, Japan,
⁵Institute for Molecular Science, Okazaki, Japan)
- 19:30 ~ 19:55** An adaptive automatic method for idealization of single-channel currents
10:30 ~ 10:55 Ayumi Hirano-Iwata^{1,2,3}, Madoka Sato^{1,3}, Masanori Hariyama⁴, Maki Komiya¹,
Hideaki Yamamoto¹
(¹Research Institute of Electrical Communication, Tohoku University, Sendai, Japan,
²WPI-Advanced Institute for Materials Research, Tohoku University, Sendai, Japan,
³Graduate School of Biomedical Engineering, Tohoku University, Sendai, Japan,
⁴Graduate School of Information Sciences, Tohoku University, Sendai, Japan)

March 8 (Wednesday)

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(Chair: Ryugo Tero)

- 17:00 ~ 17:30** Multiplexed detection of biomarkers in unprocessed clinical samples
8:00 ~ 8:30 Shenglin Cai, Thomas Pataillot-Meakin, Akifumi Shibakawa, Ren Ren,
Charlotte L. Bevan, Sylvain Ladame, Aleksandar P. Ivanov, Joshua B. Edel
(Department of Chemistry, Molecular Science Research Hub, Imperial College
London, London, UK)
- 17:30 ~ 18:00** Investigation of cell biochemical behavior under physical microenvironment using
8:30 ~ 9:00 scanning electrochemical microscopy
Fei Li, Shuake Kuermanbayi, Junjie Zhang, Zhaoyang Ye
(School of Life Science and Technology, Xi'an Jiaotong University, Xi'an, China)

18:00 ~ 18:30 The Electrostatically asymmetric nanopore for single peptide sensing and
9:00 ~ 9:30 sequencing

Yi-lun Ying, Fan Gao, Xinyi Li, Hongyan Niu, Yi-Tao Long

(State Key Laboratory of Analytical Chemistry for Life Science, School of Chemistry and Chemical Engineering, Nanjing University, Nanjing, China)

18:30 ~ 18:50 Break

9:30 ~ 9:50

(Chair: Teng Ma)

18:50 ~ 19:20 Anodic TiO₂ nanotubes with defined intertube spacing in biomedical applications

9:50 ~ 10:20 Anca Mazare^{1,2}, Patrik Schmuki^{1,3,4}

(¹Department of Materials Science WW-4, LKO, Friedrich-Alexander University of Erlangen-Nuremberg, Erlangen, Germany, ²WPI-Advanced Institute for Materials Research, Tohoku University, Sendai, Japan, ³Regional Centre of Advanced Technologies and Materials, Olomouc, Czech Republic, ⁴Department of Chemistry, Faculty of Science, King Abdulaziz University, Jeddah, Saudi Arabia)

19:20 ~ 19:45 Nonlinear responses observed in random arrays of gold nanoparticles assembled by
10:20 ~ 10:45 dielectrophoresis

Yoshinao Mizugaki, Tetsuya Urae, Hiroshi Shimada

(Department of Engineering Science, The University of Electro-Communications (UEC Tokyo), Chofu, Tokyo, Japan)

19:45 ~ 20:05 Development of a highly sensitive gas sensor using TiO₂-nanotube film

10:45 ~ 11:05 Daisuke Tadaki¹, Kazuki Iwata², Hiroyuki Abe³, Teng Ma¹, Ayumi Hirano-Iwata¹, Yasuo Kimura⁴, Shigeaki Suda⁵, Michio Niwano¹

(¹Tohoku University, Sendai, Japan, ²Tohoku Fukushi University, Sendai, Japan, ³Industrial Technology Institute, Miyagi Prefectural Government, Sendai, Japan, ⁴Tokyo University of Technology, Hachioji, Tokyo, Japan, ⁵Miyagi Factory, CHEST M.I., Inc., Japan)