RIEC
Research Institute of Electrical Communication
Tohoku University

The Joint Symposium of 9th International Symposium on Medical, Bio- and Nano-Electronics, and 6th 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

Information Biotronics Seminar

Sendai Plasma Forum

Cooperative Society

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

March 2-4, 2015

Sendai, Japan

The Joint Symposium of
9th International Symposium on Medical, Bio- and Nano-Electronics,
and
6th 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 University

Toshiro Kaneko, Tohoku University

Program Committee

Michio Niwano, Tohoku University

Toshiro Kaneko, Tohoku University

Ayumi Hirano-Iwata, Tohoku University

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Keisuke Takashima, Tohoku University

Teng Ma, Tohoku University

Program

March 2 (Monday)

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

10:00 ~ 10:05 Opening Remarks
Michio Niwano (Tohoku University, Japan)

(Chair: Teng Ma)

10:05 ~ 10:50 Self-organized TiO_2 nanotube arrays: Latest features and applications
Patric Schmuki (Department of Materials Science WW-4, LKO, University of Erlangen-Nuremberg, Germany)

10:50 ~ 11:30 Probing ultrafast spin dynamics by laser-combined STM
Hidemi Shigekawa (Faculty of Pure and Applied Science, University of Tsukuba, Japan)

11:30 ~ 12:00 Polarity Reversal of Tunnel Magnetoresistance Observed in Lateral Ferromagnet-Superconductor-Ferromagnet Single-Electron Transistor
Yoshinao Mizugaki[1,2], Masashi Takiguchi[1], and Hiroshi Shimada[1,2] ([1]The Univ. of Electro-Communications (UEC Tokyo), [2]CREST, JST)

12:00 ~ 13:30 Lunch

(Chair: Toshiro Kaneko)

13:30 ~ 14:15 Incorporation of Surface Biofunctionalities by Chemical Plasma Techniques
Chun-Chieh Fan, Sze-Jinn Chen, and Meng-Jiy Wang (Department of Chemical Engineering, National Taiwan University of Science and Technology, Taiwan)

14:15 ~ 14:45 Quantum-dot-based Nanometrological Analysis of Intracellular Trafficking Activities in Living Cell
Makoto Kanzaki (Graduate School of Biomedical Engineering, Tohoku University, Japan)

14:45 ~ 15:15 Cell Membrane Permeabilization inside Irraidation Region Using Atmospheric-Pressure Plasma
Shota Sasaki[1], Yutaro Hokari[1], Makoto Kanzaki[2], and Toshiro Kaneko[1] ([1]Department of Electronic Engineering, Tohoku University, [2]Department of Biomedical Engineering, Tohoku University, Japan)

15:15 ~ 15:30 Coffee break

(Chair: Hideaki Yamamoto)

15:30 ~ 16:00 Type Classification of Exosome Adsorption to Solid Surfaces by Atomic Force Microsopy in Aqueous Environment

Toshio Ogino[1,2] and Keiji Yokota[1,2] ([1]Yokohama National University, [2]CREST/JST, Japan)

16:00 ~ 16:30 Micro-/ nano-compartments between substrate-supported model membrane and silicone elastomer

Kenichi Morigaki[1,2] ([1]Research Center for Environmental Genomics, Kobe University, Japan, [2]Graduate School of Agricultural Science, Kobe University, Japan)

16:30 ~ 17:00 A simple method for lipid bilayer formation using a fine gold electrode

Daichi Okuno[1], Minako Hirano[2], Hiroaki Yokota[2], Tomotaka Komori[1], Yukiko Onishi[1], Toshio Yanagida[1], and Toru Ide[3] ([1]Laboratory for Cell Dynamics Observation, Quantitative Biology Center, Riken, [2] The Graduate School for the Creation of New Photonics Industries, [3]Graduate School of Natural Science and Technology, Okayama University)

March 3 (Tuesday)

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

(Chair: Yuji Matsuura)

9:00 ~ 9:30 Mid-infrared Laser Tissue Interactions for Less-invasive and Selective Laser Treatments
Katsunori Ishii, Keisuke Hashimura, and Kunio Awazu (Graduate School of Engineering, Osaka University, Japan)

9:30 ~ 10:00 High-speed endoscopic Raman imaging by using hollow fiber bundle
T. Katagiri[1], S. Inoue[2], and Y. Matsuura[1,2] ([1]Graduate School of Engineering, Tohoku University, [2]Graduate School of Biomedical Engineering, Tohoku University)

10:00 ~ 10:15 Coffee break

(Chair: Masashi Sahashi)

10:15 ~ 11:00 Incorporating magnetoelectric switching and metal-insulator transitions into next generations of non-volatile memory
Pavel Borisov, Toyanath Joshi, and David Lederman (West Virginia University, USA)

11:00 ~ 11:30 Magnetic oxides: applications of bulk and nanostructured forms
Eiji Kita and Hideto Yanagihara (Institute of Applied Physics, University of Tsukuba, Japan)

11:30 ~ 12:00 Magnetoelectric switching of perpendicular exchange bias in Pt/Co/Cr_2O_3/Pt stacked films
Yuu Shiratsuchi (Department of Materials Science and Engineering, Osaka University, Japan)

12:00 ~ 13:00 Lunch

13:00 ~ 14:45 Poster session

(Chair: Takashi Watanabe)

14:45 ~ 15:30 Brain Machine Interface Controlled Functional Electrical Stimulation Therapy
Milos R. Popovic[1,2] ([1]Institute of Biomaterials and Biomedical Engineering, University of Toronto, Canada and [2]Toronto Rehabilitation Institute, University Health Network, Toronto, Canada)

15:30 ~ 16:00 Robot-aided Rehabilitation Task Design Based on Musculoskeletal
Yangling Pei (Graduate School of Biomedical Engineering, Tohoku University, Japan)

16:00 ~ 16:15 Coffee break

(Chair: Keisuke Takashima)

16:15 ~ 17:00 Plasma Applications to Agriculture: Plasma Farming
SukJae Yoo (Plasma Technology Research Center, National Fusion Research Institute, Korea)

17:00 ~ 17:30 Plasma and pulsed power applications for agriculture
Koichi Takaki (Iwate University, Department of Electrical and Electronics Eng., Iwate University, Japan)

17:30 ~ 18:00 Suppression Effect on Germination of Strawberry Pathogen by Atmospheric Pressure Air and N_2 Plasma Irradiation
Hideaki Konishi[1], Keisuke Shimada[1], Keisuke Takashima[1], Toshiro Kaneko[1], Syota Inawashiro[2], Masaaki Osaka[2], Naomi Seo[2] ([1]Department of Electronic Engineering, Tohoku University, [2]Miyagi Prefectural Agriculture and Horticulture Research Center, Japan)

March 4 (Wednesday)

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

(Chair: Michio Niwano and Ayumi Hirano-Iwata)

9:00 ~ 9:45 Developing microscale apertures for ion channel recordings with ultra-stable lipid bilayer membranes
Maurits de Planque (Electronics and Computer Science & Institute for Life Sciences, University of Southampton, United Kingdom)

9:45 ~ 10:25 Cell LEGO – Recent advances -
Hiroo Iwata (Institute for Frontier Medical Sciences,Kyoto University, Japan)

10:25 ~ 10:55 Fusion of channel-incorporated proteoliposomes into solid-supported lipid bilayer
Ryugo Tero (Department of Environmental and Life Sciences, and Electronics-Inspired Interdisciplinary Research Institute, Toyohashi University of Technology, Japan)

10:55 ~ 11:10 Coffee break

(Chair: Michio Niwano and Ayumi Hirano-Iwata)

11:10 ~ 11:40 RT atomic layer deposition of hafnium oxide by using plasma excited oxygen and water vapor
F. Hirose[1,2], K. Kanomata[1,3], B. Ahmmad[1,2], and S. Kubota[1,2] ([1]Graduate School of Science and Engineering, Yamagata University, [2]CREST, Japan Science and Technology Agency, [3]Japan Society for the Promotion of Science, Japan)

11:40 ~ 12:10 Anodization process for Nanofabrication
Yasuo Kimura[1,2] (School of Computer Science, Tokyo University of Technology, CREST JST, Graduate School of Biomedical Engineering, Tohoku University, Japan)

12:10 ~ 12:40 Recording activities of ion channel proteins in microfablicated silicon chips
Ayumi Hirano-Iwata[1,2], Yutaka Ishinari[1,2], Hideaki Yamamoto[2,3], Yasuo Kimura[2,4], and Michio Niwano[1,2,5] ([1]Graduate School of Biomedical Engineering, Tohoku University, [2]CREST, JST, [3]Frontier Research Institute for Interdisciplinary Sciences, Tohoku University, [4]School of Computer Science, Tokyo University of Technology, [5]Laboratory for Nanoelectronics and Spintronics, Research Institute of Electrical Communication, Tohoku University)

12:40 Closing

Poster Presentation

[P-1] Study on Surface Reaction in ECR Ar Plasma CVD of SiGe Alloy on Si(100) without Substrate Heating
N. Ueno, M. Sakuraba, H. Akima and S. Sato

[P-2] Shape Control of a Single Ag Nanoparticle by Scanning Tunneling Microscope Tip
Masaki Hotsuki, Satoshi Katano, and Yoichi Uehara

[P-3] Nano-scale Observation of Graphene Oxide using Scanning Tunneling Microscopy
Tao Wei, Satoshi Katano, Yoichi Uehara

[P-4] Fabrication of all-organic transistots with patterned electrodes of molecularly doped polymer thin films
Daisuke Tadaki, Teng Ma, Yasuo Kimura, and Michio Niwano

[P-5] Generation of nano-bubbles by a porous film with ordered nanoholes
Hideyuki Saito, Teng Ma, Hideaki Yamamoto, Ayumi Hirano-Iwata, and Michio Niwano

[P-6] Infrared spectroscopic study on mechanism of hydrogen adsorption and desorption on Pd surface
Takahiro Nakayama, Yuji Imai, Yasuo Kimura, Ayumi Hirano-Iwata, and Michio Niwano

[P-7] In-situ infrared spectroscopic monitoring of adsorption of dye molecules on the inner walls of TiO_2 nanotubes
Natsuki Yamada, Daisuke Tadaki, Teng Ma, and Michio Niwano

[P-8] Chronoamperometric Recording of Increased Presynaptic Glutamate Release After Induction of Long-Term Potentiation
Ryosuke Matsumura, Ayumi Hirano-Iwata, Hideaki Yamamoto, Michio Niwano

[P-9] A Basic Study on Measurement of 3-dimensional Foot Movements during Gait Using an Inertial Sensor
M. Shiotani and T. Watanabe

[P-10] In situ pH Imaging of Metal Surface Under Electrolysis
S. Sakakita, K. Miyamoto, T. Yoshinobu

[P-11] In Vitro Apatite Formation and Drug Releasing of Porous TiO_2 Microspheres Prepared by Sol-Gel Processing
M. Kawashita, Y. Tanaka, S. Uneno, G. Liu, Z. Li and T. Miyazaki

[P-12] Enhancement of Operation Temperature of Magnetoelectric Cr_2O_3/Co Exchange Coupling System
Tomohiro Nozaki, Naoki Shimomura, Satya Prakash Pati, and Masashi Sahashi

[P-13] Effect of Ir doping on Morin transition temperature of -Fe_2O_3 (0001) thinfilm
Satya Prakash Pati, Naoki Shimomura, Hironori Hoshino, Tomohiro Nozaki, Ko Mibu, and Masashi Sahashi

[P-14] Photo-acoustic Signal Detection from Dental Pulp for Pulp Vitality Test
Azusa Yamada, Satoko Kakino, Yuji Matsuura

[P-15] Photoacoustic imaging probe using ultra-thin hollow optical fibers
Atsushi Seki, Katsumasa Iwai, Yuji Matsuura

[P-16] High Purity Small Diameter Single-Walled Carbon Nanotube Synthesized by Precisely-Controlled Pluse Plasma CVD
Bin Xu, Toshiaki Kato and Toshiro Kaneko

[P-17] Improvement of Growth Yield for Graphene Nanoribbons by Plasma Chemical Vapor Deposition
Hiroo Suzuki, Toshiaki Kato and Toshiro Kaneko

[P-18] Lymphatic Adminstration and Soporation Enhanced Antitumor Effects against Tumor-bearing Lymph Node
Shigeki Kato, Yuko Shirai, Shiro Mori, Tetsuya Kodama

[P-19] Evaluation of chemotherapy for cancer by interstitial fluid pressure
Kazu Takeda, Shiro Mori and Tetsuya Kodama