6th IEEE International Nanoelectronics Conference

IEEE – INEC 2014

July 28th – 31st

Conference Hall, Hokkaido University, Sapporo, Hokkaido,

Japan

P R O G R A M

Contents

Program Details

Message

The 6th IEEE International Nanoelectronics Conference, IEEE INEC 2014 will be held in Hokkaido Univ., Sapporo, Japan on 28th - 31st July 2014. The theme of the conference is SUSTAINABLE NANOELECTRONICS, aiming in nanoelectronics for the future. This conference also aims to identify the paths between fundamental research and potential electronics, photonics and nano-science applications.

This is our 6th conference with the first held in Singapore in 2006, followed by Shanghai 2008, Hong Kong 2010, Taiwan 2011, and Singapore 2013. This conference has become an important symposium on nanoelectronics linking academics and engineers in industry.

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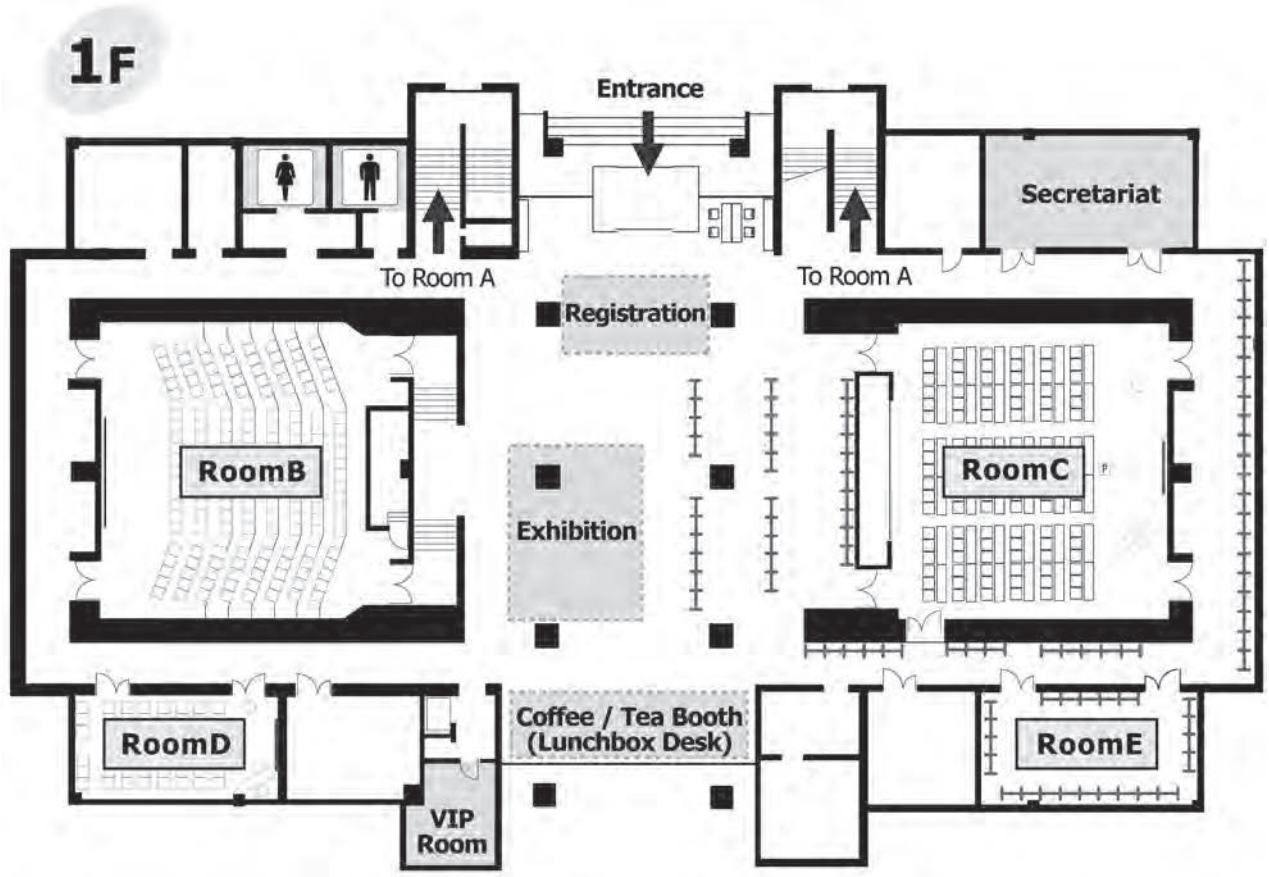
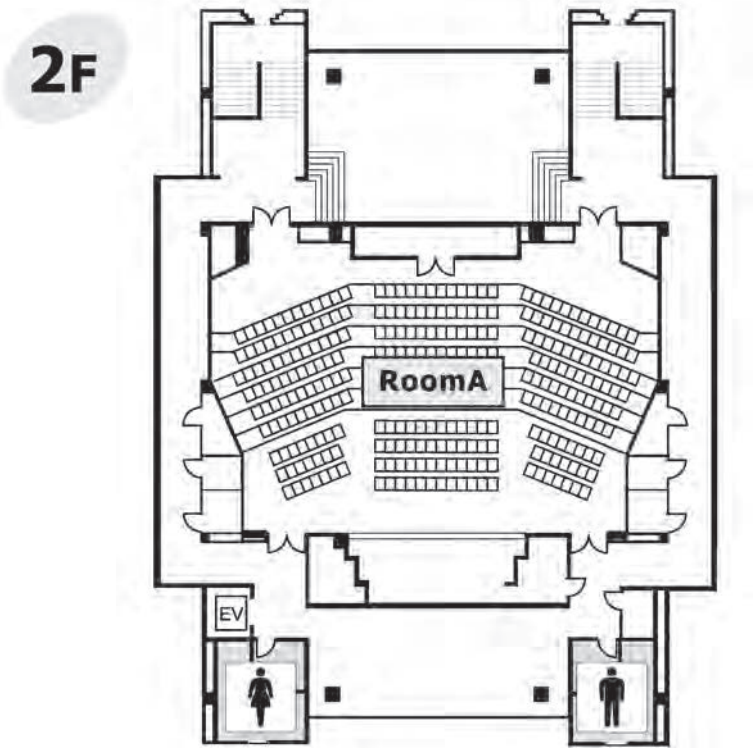
Conference Venue & Floor Plan

Conference Hall, Hokkaido University
Kita 8, Nishi 5, Kita-ku, Sapporo
Hokkaido 060-0808





Exhibitors

Cybernet Systems Co., Ltd.

JEOL

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Technology Center

Equipment Management Center,
Creative Research Institution,
HOKKAIDO UNIVERSITY

SPLEAD

Core Technology Consortium for
Advanced Energy Devices,
Tohoku University

Nano-micro Cluster,
Institute of Fluid Science,
Tohoku University

Plenary Session 1

Date/Time: Monday, 28 July, 2014 / 12:45 - 13:45
Venue/Room: Conferece Hall, Hokkaido University / Room A

Nanotechnology in the Development of Future Nanoelectronics

Meyya Meyyappan

NASA Ames Research Center
Moffett Field, CA 94035

Exploration of nanomaterials for future nanoelectronics, optoelectronics, sensors, and other applications has overwhelmingly focused on carbon nanotubes and more recently, graphene. Recently, a variety of one-dimensional inorganic nanowires have also been explored for a competitive avenue for many of these applications while being amenable to grow by CVD. Most of these nanowire materials have been used previously in the same applications as two dimensional thin films, but now in the one-dimensional form they provide quantum confinement, opportunities for bandgap engineering and exceptional surface quality. These properties and examples of nanowires will be shown first, followed by a discussion of nanowire based phase change memory as an effort towards the development of universal memory. Nanowires have also been used recently towards wearable electronics applications and some examples of e-textile will be presented. Silicon nanowires are ideal to construct BioFETs for lab-on-a-chip applications in the spirit of " More-than-Moore " based direction. Recently paper has emerged as a viable substrate for electronics, sensors, batteries and other components and examples from our work will be given. Finally, we have recently fabricated nanoscale vacuum tubes using silicon technology and obtained frequency performance that exceeds state-of-the-art silicon devices. These vacuum transistors have the potential for THz electronics. The device physics, fabrication and results will be presented. The author thanks all past and present NASA Ames colleagues for their contributions to the application development efforts, especially Jin-Woo Han, Jing Li, Yujiang Lu, Jessica Koehne and Michael Oye.

Biography

Meyya Meyyappan is Chief Scientist for Exploration Technology at NASA Ames Research Center in Moffett Field, CA. Until June 2006, he served as the Director of the Center for Nanotechnology. He is a founding member of the Interagency Working Group on Nanotechnology (IWGN) established by the Office of Science and Technology Policy (OSTP). The IWGN is responsible for putting together the National Nanotechnology Initiative.

Dr. Meyyappan has authored or co-authored over 280 articles in peer-reviewed journals and made over 200 Invited/Keynote/Plenary Talks in nanotechnology subjects across the world and over 200 seminars at universities. His research interests include carbon nanotubes, graphene, and various inorganic nanowires, their growth and characterization, and application development in chemical and biosensors, instrumentation, electronics and optoelectronics.

Dr. Meyyappan is a Fellow of the Institute of Electrical and Electronics Engineers (IEEE), Electrochemical Society (ECS), American Vacuum Society (AVS), Materials Research Society (MRS), Institute of Physics (IOP), American Institute of Chemical Engineers (AIChE) and the California Council of Science and Technology. In addition, he is a member of the American Society of Mechanical Engineers (ASME). He is currently the IEEE Nanotechnology Council (NTC) Distinguished Lecturer on Nanotechnology, IEEE Electron DevicesSociety (EDS) Distinguished Lecturer, and was ASME's Distinguished Lecturer on Nanotechnology (2004-2006). He served as the President of the IEEE's Nanotechnology Council in 2006-2007 and the Vice President of IEEE-EDS for Educational Activities in 2010-2013.

For his contributions and leadership in nanotechnology, he has received numerous awards including: a Presidential Meritorious Award; NASA's Outstanding Leadership Medal; Arthur Flemming Award given by the Arthur Flemming Foundation and the George Washington University; IEEE Judith Resnick Award; IEEE-USA Harry Diamond Award; AIChE Nanoscale Science and Engineering Forum Award; Distinguished Engineering Achievement Award by the Engineers' Council; Pioneer Award in Nanotechnology by the IEEE-NTC; Sir Monty Finniston Award by the Institution of Engineering and Technology (UK); Outstanding Engineering Achievement Merit Award (2014) by the Engineers' Council; IEEE-USA Professional Achievement Award. For his sustained contributions to nanotechnology, he was inducted into the Silicon Valley Engineering Council Hall of Fame in February 2009. For his educational contributions, he has received: Outstanding Recognition Award from the NASA Office of Education; the Engineer of the Year Award(2004) by the San Francisco Section of the American Institute of Aeronautics and Astronautics (AIAA); IEEE-EDS Education Award; IEEE-EAB (Educational Activities Board) Meritorious Achievement Award in Continuing Education.

Plenary Session 2

Date/Time: Tueaday, 29 July, 2014 / 14:15 - 15:15
Venue/Room: Conference Hall, Hokkaido University / Room A

Recent technology of the lithium ion battery

Akira Yoshino

General Manager, Yoshino Laboratory, Asahi Kasei Corp.
2-1, Samejima, Fuji, Shizuoka, Japan

The lithium-ion battery (LIB) is a secondary battery that uses a non-aqueous electrolyte with carbon as the negative electrode and a transition metal oxide containing lithium ion as the positive electrode. This new battery system was invented in 1985. The use of a non-aqueous electrolyte allowed the cell voltage of the LIB to be raised to 4.2 V. This major leap in cell voltage enabled smaller size and lighter weight.

Ion diffusion behavior is one of the most important factors influencing battery performance. In an actual battery, ions exist within nano order pores in the electrodes and separator. Ion diffusion behavior within nano order pores may be different in bulk electrolyte solution. In this work, we measured diffusion constants of ions within separator by PFG-NMR method and discussed relationship between diffusion behavior and battery performance.

The summary of experimental results is as follows;

1. It became possible to distinguish between ions within separator and ions in free electrolyte solution by NMR.
2. Succeeded in measuring of ion diffusion constants of ions within separator taken in X, Y, and Z axes by PFG-NMR.
3. Ion diffusion constants were three-dimensionally anisotropic.
4. Different separators showed different anisotropies.
5. Unexpectedly, diffusion constants in the Z axis was completely unrelated to battery rate capability
6. There is a high correlation between battery rate capability and the square root of the product of the diffusion constants in three axes
7. This is a useful finding for separator design

In this lecture, new experimental results about the relationship between low temperature battery performance and ion diffusion behavior of ions within separator will be discussed.

KEY WORDS
1)Lithium ion battery
2)Separator
3)Ion diffusion
4)PFG-NMR
5)Nano order pore

Plenary Session 3

Date/Time: Wednesday, 30 July, 2014 / 14:15 - 15:15
Venue/Room: Conference Hall, Hokkaido University / Room A

Control of magnetization using current and voltage

Yoshishige SUZUKI

Osaka University, Spintronics center in AIST and JST-CREST
Graduate School of Engineering Science,
Department of Materials Engineering Science,
Toyonaka, Osaka, 560-8531, Japan

Control of magnetization in nano-size magnets draws many researcher' s attention since it is a key issue to design magnetic cells in magnetic random access memory (MRAM) and magnetic sensors for hard disk drive (HDD). Especially, after findings of the giant magneto-resistance effect (GMR)[1] and large tunnel magneto-resistance effect (TMR)[2,3], the researches progressed significantly by sake of easy electrical detection of the dynamics in submicron size magnets using MR effects. In addition, it was found that a current injection through the nano-magnets causes in a production of "spin-current" and consequently a magnetization reversal[4, 5] and a domain wall motion [6] can be driven. Developments of the MRAMs using the mechanism is progressing[7]. Since MRAM is non-volatile high-speed memory, it is expected that a replacement of DRAM and SRAM offers us an energy saving "normally-off computing system" [8]. Recent, developments in voltage control of the magnetization at room temperature[9-12] can be a next technology realizing ultra-low power magnetic devices.

Acknowledgements: Spintronics research center in AIST, Spintronics group in Osaka University, and Spintransfer-MRAM development group in Toshiba. NEDO Normally-off computing project, and MEXT Basic research S "High frequency spintronics" project.

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KEY WORDS
1)MRAM
2)Spin-transfer
3)Voltage
4)Magnetic anisotropy
5)Dynamics

Monday, 28 July 2014

Session: **Carbon-1**
Time: 13:55 – 15:50
Venue: Room A
Chair: Dominique Ballargeat

【Invited】 13:55 – 14:20

Carbon nanotubes based nanopackaging dedicated to innovative high frequency interconnections

Dominique BAILLARGEAT[1,3], Beng Kang TAY[1,2]

[1] CINTRA CNRS/NTU/THALES, UMI 3288, Research Techno Plaza, 50 Nanyang Drive, Border X Block, Level 6, Singapore 637553, SINGAPORE,
[2] School of Electrical and Electronics Engineering, Nanyang Technological University, Block S1, 50 Nanyang Avenue, Singapore 639798, SINGAPORE,
[3] XLIM UMR 7252, Université de Limoges/CNRS, 123 Avenue Albert Thomas 87060 Limoges, FRANCE

【Invited】 14:20 – 14:45

Flexible electronics applications of carbon nanotube thin films

Yutaka Ohno

Nagoya University, Japan

【Special Invited】 14:45 – 15:35

Maximising Electron Emission from Carbon Nanotube Arrays for Large Area Substrates

S. Ravi P. Silva[1], K.D.G.I. Jayawardena[1], J.S. Chen[1], Muhammad Ahmad[1], J.V. Anguita[1], G.D.M.R. Dabera[1], A.R. Corless[1], J.D. Carey[1], V. Stolojan[1], M. Cole[2], W.I. Milne[2]

[1] Advanced Technology Institute, Department of Electronic Engineering, University of Surrey, United Kingdom,
[2] Engineering Department, University of Cambridge, United Kingdom

15:35 – 15:50

Fabrication of Graphene-Silicon Schottky Junction Based Photodetector.

Golap Kalita, Muhammed EmreAyhan, Sachin Shinde, Remi Papon, Riteshkumar Vishwakarma, Masaki Tanemura

Nagoya Institute of Technology, Japan

Session: **Emission-1**
Time: 16:10 – 18:15
Venue: Room A
Chair: Masayoshi Nagao

【Invited】 16:10 – 16:35

Applying 2D materials for Emission and Energy Storage

Daniel Chua
National University of Singapore, Singapore

【Invited】 16:35 – 17:00

Mechanical pencil lead; a cheap but superior field emitter

Masahiro Sasaki, Yoichi Yamada
Institute of Applied Physics, Univ. of Tsukuba, Japan

【Invited】17:00 – 17:25

"C-lighting" lamp with carbon nanotube electron beam (C-beam)

Kyu Chang Park, Jung Su Kang

Dept. of Information Display, Kyung Hee University, Dongdaemoon-ku, Seoul, Korea

【Invited】17:25 – 17:50

Ken Okano

International Christian University, Japan

【Invited】17:50 – 18:15

Development of miniature x-ray source using pyroelectric crystal excited by laser light

Satoshi Abo, Takahiro Uezato, Fujio Wakaya, Masayuki Abe, Mikio Takai

Graduate School of Engineering Science, Osaka University, Japan

Session: **Fab-1**
Time: 13:55 – 15:35
Venue: Room B
Chair: Wang Jae Chun & Kenji Hara

【Invited】13:55 – 14:20

Surface structures of Metal species on Oxide supports Probed by Synchrotron Radiation X-ray Absorption Fine Structure(XAFS)

Wang Jae Chun

International Christian University, Japan

【Invited】14:20 – 14:45

Preparation and 3D structure analysis of atomically dispersed metal species on a TiO_2(110) single crystal surface premodified with functional organic molecules

Satoru Takakusagi[1], Hirotaka Nojima[1], Hiroko Ariga[1], Hiromotsu Uehara[1], Kotaro Miyazaki[1], Wang-Jae Chun[2], Yasuhiro Iwasawa[3], Kiyotaka Asakura[1]

[1] *Hokkaido University, Japan,*
[2] *International Christian University, Japan,*
[3] *The University of Electro-Communications, Japan*

【Invited】14:45 – 15:10

Construction of Molecular Layers with Viologen Moieties and Pt Complexes on a Hydrogen-Terminated Si(111) Surface for Highly Efficient Hydrogen Evolution and CO_2 Reduction

Takuya Masuda[1,2], Kohei Uosaki[1,3]

[1] *National Institute for Materials Science (NIMS), Japan,*
[2] *Japan Science and Technology Agency (JST), Japan,*
[3] *Hokkaido University, Japan*

【Invited】15:10 – 15:35

Self-Assembled Monolayer on Gold Surface for Metal Grafting and Catalytic Application

Kenji Hara

Catalysis Research Center, Hokkaido University

Session: **CMOS-1**
Time: 16:10 – 18:20
Venue: Room B
Chairs: Juin. J. Liou & Tetsuya Asai

【Invited】 16:10 – 16:35

Fully implantable retinal prosthesis using low power artificial retina LSI with edge enhancement function

Tetsu Tanaka

Graduate School of Biomedical Engineering, Tohoku University, JAPAN

【Invited】 16:35 – 17:00

Reliability of nanoelectronics: circuits and systems approaches

Alexandre Schmid

EPFL, Switzerland

【Invited】 17:00 – 17:25

A Memristor ---the Fourth Fundamental Circuit Element--- and its Application to Unconventional Computation

Tetsuya Asai

Hokkaido University, Japan

【Invited】 17:25 – 17:50

Cellular Automaton-based Nanoelectronic Hardware

Ferdinand Peper[1], Takeo Watanabe[2], Teijiro Isokawa[3], Nobuyuki Matsui[3]

[1] Center for Information and Neural Networks, National Institute of Information and Communications Technology (NICT), and Osaka University, Japan,
[2] Center for EUVL, Laboratory of Advanced Science and Technology for Industry, University of Hyogo, Japan,
[3] Graduate School of Engineering, University of Hyogo, Japan

17:50 – 18:05

Development of Single-Molecule Tunnel-Current based Nucleotide identification Method

Takahito Ohshiro, Makusu Tsutsui, Kazumichi Yokota, Tomoji Kawai, Masateru Taniguchi

ISIR, Osaka University, Japan

18:05 – 18:20

Implementation of an Ultra-Low Voltage Robust Low-Power Static Domino Inverter

Halfdan Bechmann, Yngvar Berg

University of Oslo, Norway

Session: **Photo-1**
Time: 13:55 – 15:50
Venue: Room C
Chair: Kwangseuk Kyhm

【Invited】 13:55 – 14:20

Frequency Conversion in Quantum-Dot Photonic-Crystal Nanocavity Laser

Satoshi Iwamoto[1,2], Yasutomo Ota[2], Yasuhiko Arakawa[1,2]

[1] Institute of Industrial Science, the University of Tokyo, Japan,
[2] Institute for Nano Quantum Information electronics, the University of Tokyo, Japan

【Invited】14:20 – 14:45

Wavelength-dependent Optical Torque upon Gold Nanorod

Jiunn-Woei Liaw[1,2]

[1] Department of Mechanical Engineering, Chang Gung University, Taiwan,
[2] Center for Biomedical Engineering, Chang Gung University, Taiwan

【Special Invited】14:45 – 15:35

Plasmon-induced solar energy conversion systems

Hiroaki Misawa

Research Institute for Electronic Science, Hokkaido University, Japan

15:35 – 15:50

Enhanced surface plasmon resonance detection of biotin-streptavidin interactions using porous gold substrate by oblique evaporation

Nak-Hyeon Kim[1], Kyung Min Byun[1], Tae Woo Kim[2], Jung Woo Leem[3], Jae Su Yu[3]

[1] Department of Biomedical Engineering, Kyung Hee University, Republic of Korea,
[2] School of East–west Medical Science, Kyung Hee University, Republic of Korea,
[3] Department of Electronics and Radio Engineering, Kyung Hee University, Republic of Korea

Session: **MEMS-1**
Time: 16:10 – 18:20
Venue: Room C
Chair: Shoji Takeuchi & Manabu Tokeshi

【Invited】16:10 – 16:35

Microfluidic technology for biomedical applications (tentative)

Shoji Takeuchi

The University of Tokyo, Japan

【Invited】16:35 – 17:00

Microfluidic Devices for Medical Diagnosis and Gene Therapy

Manabu Tokeshi

Hokkaido University, Japan

【Invited】17:00 – 17:25

Multifunctional Tactile Sensors using MEMS Cantilevers

Masayuki Sohgawa

Niigata University, Japan

【Invited】17:25 – 17:50

Dual AFM probe for imaging and in-situ mechanical operation

Takashi Mineta

Yamagata University, Japan

17:50 – 18:05

Microfluidic mechanical-stress bioreactor for stem cell stimulation

Chia-Wen Tsao[1], Li-Chiang Yeh[1], Yu-Che Cheng[2]

[1] Department of Mechanical Engineering, National Central University, Taiwan,
[2] Proteomics laboratory, Cathay Medical Research Institute, Cathay General Hospital, Taiwan

18:05 – 18:20

Resonant silicon micromirror with electroplated carbon nanotues-nickel composite beams for MEMS application

Zhonglie An[1,2], Masaya Toda[1], Go Yamamoto[3], Toshiyuki Hashida[3], Takahito Ono[1]

[1] *Graduate School of Engineering, Tohoku University, Japan,*
[2] *Micro System Integration Center, Tohoku University, Japan,*
[3] *Fracture and Reliability Research Institute, Tohoku University, Japan*

Tuesday, 29 July 2014

Session: **Carbon-2**
Time: 9:10 – 11:15
Venue: Room A
Chair: Golap Kalita

【Invited】 9:10 – 9:35

Carbon-Based Hybrid Nanostructures for Electrochemical Energy Storage

Tay Beng Kang

Nanyang Technological University, Singapore

【Invited】 9:35 – 10:00

Electrical properties and applications of carbon nanotube composites

Eiichi Sano

Hokkaido University, Japan

【Invited】 10:00 – 10:25

Sensor application of nanocarbon mechanical resonators

Seiji Akita

Osaka Prefecture University, Japan

【Invited】 10:25 – 10:50

Graphene synthesis from poly(methyl methacrylate) by microwave plasma treatment at low temperature

Takatoshi Yamada, Masatou Ishihara, Masataka Hasegawa

National Institute of Advanced Industrial Science and Technology (AIST), Japan

【Invited】 10:50 – 11:15

Realization of Carbon Nanostructures White-light Light-emitting Devices

Siu Fung Yu[1,2]

[1] The Hong Kong Polytechnic University Shenzhen Research Institute, Shenzhen 518057, China,
[2] Department of Applied Physics, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong, China

Session: **Energy-1**
Time: 11:25 – 13:05
Venue: Room A
Chair: Seiji Samukawa

【Invited】 11:25 - 11:50

Nanostructures for energy harvesting and sensing: from thermoelectric to piezoelectric devices

Laurent Montes

Grenoble Institute of Technology, France

【Invited】 11:50 – 12:15

Engineering of lead-free piezoelectric ceramics and composites for energy harvester

Ken-ichi Kakimoto

Nagoya Institute of Technology, Japan

【Invited】12:15 – 12:40

High-Efficiency Hybrid Organic/Silicon Nanowire Heterojunction Solar cells

Peichen Yu[1], Ming-Chin Li[2], Yi-Chun Lai[1], Pei-Ting Tsai[3], Wei-Shuan Tseng[4], Chih-I Wu[4], Jui-Chung Hsiao[5], Chen-Hsun Du[5], Sheng-Fu Horng[2], Hsin-Fei Meng[3]

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[2] Department of Electrical Engineering and Institute of Photonics Technologies, National Tsing-Hua University, Hsinchu 30071, Taiwan,
[3] Institute of Physics, National Chiao-Tung University, Hsinchu 30010, Taiwan,
[4] Department of Electrical Engineering and Graduate Institute of Photonics and Optoelectronics, National Taiwan University, Taipei 10617, Taiwan,
[5] Green Energy and Environment Research Laboratories, Industrial Technology Research Institute, Hsinchu 31040, Taiwan

【Invited】12:40 – 13:05

Current status of thin-film silicon nanowire solar cells

Shinsuke Miyajima

Tokyo Institute of Technology, Japan

Session: **Energy-2**
Time: 15:25 – 17:45
Venue: Room A
Chair: Alain Fave

【Invited】15:25 – 15:50

High Efficiency Nano Energy Devices UsingBio-template Top-Down Process

Seiji Samukawa

Tohoku University, Japan

【Invited】15:50 – 16:15

Photonic nanostructures coupled with vertically aligned quantum dots for solar cell applications

Noritaka Usami

Nagoya University, Japan

【Invited】16:15 - 16:40

Applications of nanoelectrodes for high power and high energy density lithium ion batteries

Itaru Honma

IMRAM, Tohoku University, Japan

【Invited】16:40 – 17:05

In Situ Analysis of Electrode Reactions in Solid Oxide Fuel Cells

Koji Amezawa[1], Yoshinobu Fujimaki[1], Kiyoharu Nitta[2], Yasuko Terada[2], Takashi Nakamura[1], Fumitada Iguchi[1], Hiroo Yugami[1], Keiji Yashiro[1], Tatsuya Kawada[1]

[1] Tohoku University, Japan,
[2] JASRI, Japan

【Invited】17:05 – 17:30

Ionic Liquids as a Potential Electrolyte for Energy Devices

Hajime Matsumoto

National Institute of Advanced Industrial Science and Technology (AIST), Japan

17:30 – 17:45

Atomistic Study of Proton Hopping Mechanism in Hydrated Nafion Membrane

Takuya Mabuchi, Takashi Tokumasu

Tohoku University, Japan

Session: CMOS-2
Time: 9:10 – 11:05
Venue: Room B
Chairs: Alexandre Schmid & Hyunsang Hwang

【Invited】 9:10 – 9:35

Prospect of Electrostatic Discharge Protection in Emerging Silicon Nanowire Technology

Juin J. Liou[1,2]

[1] Pegasus Distinguished Professor/Lockheed Martin St. Laurent Professor of Engineering University of Central Florida, Orlando, Florida, USA,
[2] Chang Jiang Scholar Endowed Professor, Ministry of Education, China

【Invited】 9:35 – 10:00

GAA Sidewall-Damascened Poly-Si NWs Channels FETs and Junctionless FETs

Tien-Sheng Chao, Po-Yi Kuo, Tien-Shun Chang, Yi-Hsien Lu

Department of Electrophysics, National Chiao Tung University, Taiwan

【Invited】 10:00 – 10:25

Silicon nanowire MOSFETs for diverse applications

Akira Fujiwara, Katsuhiko Nishiguchi, Gento Yamahata

NTT Basic Research Laboratories, Japan

【Invited】 10:25 – 10:50

Synthesis and Characterization of GaN Nanowires on Silicon using Low Pressure Chemical Vapor Deposition

Hong Wang[1,2], Saleem Umar[1,2], Aurélien Olivier[2], Gang Ye[1]

[1] Novitas, Nanoelectronics Centre Of Excellence, School of Eectrical and Electronic Engineering, Nanyang Technological University, Singapore,
[2] CINTRA CNRS/NTU/THALES, UMI 3288, Singapore

10:50 – 11:05

Gate-All-Around Junctionless Nanowire Transistors — Study on Channel Doping Concentration and Nanowire Dimension

Jer-Yi Lin, Po-Yi Kuo, Co-Li Lin, Tien-Sheng Chao

Department of Electrophysics, National Chiao Tung University, Taiwan

Session: CMOS-3
Time: 11:25 – 12:45
Venue: Room B
Chairs: Tien-Sheng Chao & Wang Hong

【Invited】 11:25 – 11:50

ReRAM Device Technology for Neuromorphic Computing

Hyunsang Hwang

Pohang University of Science & Technology, Korea

【Invited】 11:50 – 12:15

Thermal-aware device design of nanosale MOSFETs

Ken Uchida[1,2], Tsunaki Takahashi[1,2]

[1] Keio University, Japan,
[2] JST-CREST, Japan

12:15 – 12:30

ULTRA LOW-VOLTAGE STATIC PRECHARGE NAND/NOR GATES

Omid Mirmotahari, Halfdan Bechmann, Yngvar Berg

University of Oslo, Norway

12:30 – 12:45

Junctionless transistors for dynamic memory and sensing applications

Mukta Singh Parihar, Abhinav Kranti

Low Power Nanoelectronics Research Group, Electrical Engineering Discipline, Indian Institute of Technology Indore, India

Session: **Carbon-3**
Time: 15:25 – 17:15
Venue: Room B
Chair: Shu Ping Lau

【Invited】 15:25 – 15:50

Epitaxial Graphene from Silicon Carbide: Growth Dynamics, Kinetics and Implications

Eng Soon Tok

National University of Singapore, Singapore

【Invited】 15:50 – 16:15

Epitaxial graphene grown by infrared rapid thermal annealing

Masao Nagase

Univ. of Tokushima, Japan

16:15 – 16:30

Growth and UV-Enhanced Room-Temperature Gas Sensing Properties of Dendrite- and Bead-Like p-TeO_2/n-SnO_2 Hierarchical Heterostructures

Yung-Chiun Her, Ping-Fu Huang

National Chung Hsing University, Taiwan

16:30 – 16:45

Growth and photoluminescence enhancement of core shell ZrO_2-ZnO nanowire arrays

Yuan Zhang[1], Hong-Liang Lu[1], Tao Wang[1], De-Hui Li[2], Shi-Jin Ding[1], David Wei Zhang[1]

[1] State Key Laboratory of ASIC and System, Institute of Advanced Nanodevices, School of Microelectronics, Fudan University, China,
[2] Shanghai Institute of Applied Physics, Chinese Academy of Sciences, China

16:45 – 17:00

Aluminum Doped ZnOS composite Nanowires: Photoluminescence and Photoresponse Studies

Soumen Dhara[1], Kenji Imakita[1], Minoru Mizuhata[2], Minoru Fujii[1]

[1] Department of Electrical and Electronic Engineering, Graduate School of Engineering, Kobe University, Japan,
[2] Department of Chemical Science and Engineering, Graduate School of Engineering, Kobe University, Japan

17:00 – 17:15

Giant current density via indirect exciton orbit overlapping in polarized nano-granular materials

Hans W.P. Koops[1], Hiroshi Fukuda[2]

[1] HaWiKo GmbH, Germany,
[2] Hitachi High-Technologies Corporation, Japan

Session: **Photo-2**
Time: 9:10 – 11:05
Venue: Room C
Chair: Satoshi Iwamoto

【Invited】 9:10 – 9:35

Quantum devices with novel states of matter

Alex Hayat

Technion - Israel Institute of Technology, Israel

【Invited】 9:35 – 10:00

Controlling circularly-polarized emission and second-harmonic generation with artificial nanostructures

Kuniaki Konishi[1], Makoto Kuwata-Gonokami[1,2,3]

[1] Photon Science Center, The University of Tokyo, Japan,
[2] Department of Physics, The University of Tokyo, Japan,
[3] Institute for Photon Science and Technology, The University of Tokyo, Japan

【Invited】 10:00 – 10:25

Broadly tunable single-mode slot quantum cascade lasers (tentative)

Qijie Wang

Nanyang Technological University, Singapore

【Invited】 10:25 – 10:50

Dynamics of photo-excited carriers and spin-related phenomena in III-V semiconductor nanostructures

Akihiro Murayama

Graduate School of Information Science and Technology, Hokkaido University, Japan

10:50 – 11:05

Microcavity Organic Light Emitting Diodes with ITO DBR Electrodes

Li-Yin Chen, Wei-Chen Tien, Kai-Wen Chang, Ann-Kuo Chu

Department of Photonics, National Sun Yat-sen University, Taiwan

Session: **Model-1**
Time: 11:25 – 12:55
Venue: Room C
Chair: Hiroyuki Kageshima

【Invited】 11:25 – 11:50

Simulation and multivariate statistical analysis of physical characteristics of dispersive ensembles of semiconductor nano-sized objects

Oleksandr Voskoboynikov

National Chiao Tung University, Taiwan

【Invited】 11:50 – 12:15

On Characteristic Fluctuation of Nonideal Bulk FinFET Devices

Yiming Li, Wen-Tsung Huang

National Chiao Tung University, Taiwan

【Invited】 12:15 – 12:40

Computational Materials Design (CMD®): Realization of the Switching Mechanism in RRAM

Hideaki Kasai[1,2], Susan Aspera[1], Yukio Tamai[3], Nobuyoshi Awaya[3]

[1] Department of Applied Physics, Osaka University, Japan,
[2] Center for Atomic and Molecular Technologies, Osaka University, Japan,
[3] Corporate Research and Development Group, Sharp Corporation, Japan

12:40 – 12:55

Theoretical Modeling for Carrier Diffusion Coefficient in One-Dimensional Si Wires around Room Temperature

Yasuhisa Omura, Shingo Sato

Kansai University, Japan

Session: **MEMS-2**
Time: 15:25 – 17:45
Venue: Room C
Chairs: Takahito Ono & Hiromu Ishii

【Invited】 15:25 – 15:50

Nonlinear electromechanical resonators ～ From Phonon Lasing Operation to Nanomechanical Processors ～

Hiroshi Yamaguchi, Daiki Hatanaka, Imran Mahboob, Hajime Okamoto

NTT Basic Research Laboratories, Japan

【Invited】 15:50 – 16:15

Geunbae Lim

Pohang University of Science and Technology, Korea

【Invited】 16:15 – 16:40

Bacterial diagnostic microfluidic chip for detecting Legionella pneumophila

Hiromu Ishii[1], Makoto Ishida[1,2], Kazuaki Sawada[1,2], Katsuyuki Machida[3,4], Kazuya Masu[4], Ken-ichiro Iida[5], Mitsumasa Saito[5], Shin-ichi Yoshida[5]

[1] Toyohashi University of Technology, JAPAN,
[2] Electronics-Inspired Interdisciplinary Research Institute(EIIRIS), Toyohashi University of Technolory, Japan,
[3] NTT Advanced Technology Corporation, Japan,
[4] Tokyo Institute of Technology, Japan,
[5] Faculty of Medical Sciences, Kyushu University, Japan

【Invited】 16:40 – 17:05

Si Integrated Ferroelectric MEMS Sensors using Epitaxial PZT Thin Films on γ-Al_2O_3/Si Substrates

Daisuke Akai

Toyohashi University of Technology, Japan

【Invited】 17:05 – 17:30

Micro/nano-resonators for ultimate sensing

Takahito Ono

Tohoku University, Japan

17:30 – 17:45

High photocurrent and operation frequency for light-addressable potentiometric sensor by thinner Si substrate

Tsung-Cheng Chen[1], Wei-Yin Zeng[1], Yuan-Hui Liao[2], Anirban Das[1], Chia-Ming Yang [1,2,3,4], Chao-Sung Lai[1,2,3,4]

[1] Department of Electronic Engineering, Chang Gung University, Taiwan,
[2] Institute of Electro-Optical Engineering, Chang Gung University, Taiwan,
[3] Healthy Aging Research Center, Chang Gung University, Taiwan,
[4] Center for Biomedical Engineering, Chang Gung University, Taiwan

Session: **Fab-2**
Time: 9:10 – 11:05
Venue: Room D
Chair: Lin-Chi Chen & Ichiro Yamashita

【Invited】 9:10 – 9:35

Novel biosensor platform based on Si-nanowire-network structures

Jeong-Soo Lee[1], Meyya Meyyappan[2]

[1] Pohang University of Scitnce and Technology(POSTESH), Korea
[2] NASA Ames Research Center, USA

【Invited】 9:35 – 10:00

Single Molecular Technologies to Identify Central Dogma

Masateru Taniguchi

Osaka University, Japan

【Invited】 10:00 – 10:25

Redox Nanoparticle-based Electrochromic Displays and Electrochemical Biosensors

Lin-Chi Chen

National Taiwan University, Taiwan

【Invited】 10:25 – 10:50

Bio-based nanodevice fabrication: Another path to the nanoelectronics.

Ichiro Yamashita

NAIST, Japan

10:50 – 11:05

Characteristics of Nitrogen-Contained Plasma Treatment on PEDOT:PSS Piezoresistive Pressure Sensors

Rajat Subhra Karmakar[1], Jer-Chyi Wang[1,2], Yu-Jen Lu[3], Hsiang-Yu Liu[1], Chia-Ming Yang[1,2], Chao-Sung Lai[1,2], Wei-Lun Zou[4], Mu-Yi Hua[4], Ming-Yih Lee[5], Chiung-Yin Huang[3], Kuo-Chen Wei[3]

[1] Department of Electronic Engineering, Chang Gung University, Taiwan,
[2] Healthy and Aging Center, Chang Gung University, Taiwan,
[3] Department of Neurosurgery, Chang Gung Memorial Hospital, Taiwan,
[4] Department of Chemical and Materials Engineering, Chang Gung University, Taiwan,
[5] Graduate Institute of Medical Mechatronics, Chang Gung University, Taiwan

Session: **Spin-1**
Time: 11:20 – 12:55
Venue: Room D
Chair: Hitoshi Kubota

【Invited】 11:25 – 11:50

Spin current physics and application

Eiji Saitoh
Institute for Materials Research, Tohoku University, Japan

【Invited】 11:50 – 12:15

Spin-Seebeck thermoelectric converter

Akihiro Kirihara[1], Masahiko Ishida[1], Ken-ichi Uchida[2,3], Hiroko Someya[1], Yuma Iwasaki[1], Kazuki Ihara[1], Shigeru Kohmoto[1], Eiji Saitoh[2,4,5,6], Tomoo Murakami[1]

[1] *NEC Corporation, Japan,*
[2] *IMR, Tohoku University, Japan,*
[3] *JST-PRESTO, Japan,*
[4] *WPI-AIMR, Tohoku University, Japan,*
[5] *Japan Atomic Energy Agency, Japan,*
[6] *JST-CREST, Japan*

【Invited】 12:15 – 12:40

Spin caloritronics in ordered alloy systems

Masaki Mizuguchi, Yuya Sakuraba, Kota Hasegawa, Koki Takanashi
Institute for Materials Research, Tohoku University, Japan

12:40 – 12:55

Spin pumping and rectification effect driven by ferromagnetic resonance in cavity

Ryo Iguchi[1], Eiji Saitoh[1,2,3,4]

[1] *Institute for Materials Research, Tohoku University, Japan,*
[2] *WPI Advanced Institute for Materials Research, Tohoku University, Japan,*
[3] *CREST, Japan Science and Technology Agency, Japan,*
[4] *The Advanced Science Research Center, Japan Atomic Energy Agency, Japan*

Session: **Emission-2**
Time: 15:25 – 17:30
Venue: Room D
Chair: Kyu Chang Park

【Invited】 15:25 – 15:50

Ultrafast switching and emittance reduction of field emission beam generated by all-metal nanotip array for high-brightness beam applications

Soichiro Tsujino
Paul Scherrer Institut, Laboratory for Micro- and Nanotechnology, Schweiz

【Invited】 15:50 – 16:15

Highly sensitive HARP image sensor with Spindt-type field emitter array

Yuki Honda[1,2], Masakazu Nanba[1], Kazunori Miyakawa[1], Misao Kubota[1], Norifumi Egami[3]

[1] *NHK Science & Technology Laboratories, Japan,*
[2] *Graduate School of Science and Technology, Shizuoka University, Japan,*
[3] *Kinki University, Japan*

【Invited】16:15 – 16:40

Investigation of a vacuum power switch using diamond PIN junction cathodes

Daisuke Takeuchi[1,3,4], Satoshi Koizumi[2,3,4], Toshiharu Makino[1,3,4], Hiromitsu Kato[1,3,4], Masahiko Ogura[1,3,4], Hiromichi Ohashi[1,3,4], Hideyo Okushi[1,3,4], Satoshi Yamasaki[1,3,4]

[1] *Energy Technology Research Institute, AIST, Japan,*
[2] *Wide Bandgap Materials Group, NIMS, Japan,*
[3] *CREST, JST c/o AIST, Japan,*
[4] *ALCA, JST c/o AIST, Japan*

【Invited】16:40 – 17:05

Long Wavelength NEA Photocathode

Minoru Niigaki, Toru Hirohata

Central Research Laboratory, Hamamatsu Photonics K.K., Japan

【Invited】17:05 – 17:30

A novel Spindt-type field emitter with a volcano-structured double-gate and its application to image sensor

Masayoshi Nagao

National Institute of Advanced Industrial Science and Technology, Japan

Poster Session 1
Time: 17:45 – 19:05
Venue: Lobby & Room E

Experimental and simulation studies of interface properties of crystalline germanium heterojunction solar cells

Shinya Nakano, Yoshiaki Takeuchi

Mitsubishi Heavy Industries, Ltd., Japan

The influence of defect energy level in CIGS solar cells

Ming-Jer Jeng[1], Evgenia Rabenok[2], Gennady Novikov[2], Jian-Ping Ao[3], Yun Sun[3], Liann-Be Chang[1], Wu-Shiung Feng[1]

[1] Department of Electronic Engineering, Chang Gung University, Taiwan,
[2] Institute of Problems of Chemical Physics, RAS, Russia,
[3] Institute of Problems of Chemical Physics, RAS, Russia

WO_3/TiO_2 core-shell nanostructure for the enhancement of electrochromic, photodegradation, and self-cleaning performance

Bohr-Ran Huang, Tzu-ChingLin, Ying-Ming Liu

Graduate Institute of Electro-Optical Engineering and Department of Electronic Engineering, National Taiwan University of Science and Technology, Taipei 106, Taiwan, R.O.C.

Development of HIT (Hetero-junction with Intrinsic Thin Layer) Solar Cells with Amorphous Layers by Electron Beam Evaporator Deposition

M. H. Lee, Z.-Y. Chen, J.-D. Liu

National Taiwan Normal University, Taiwan

Study on flexibility of a glucose biofuel cell fabricated using MEMS processes

Tsubasa Sasaki, Shohei Koide, Ryohei Sano, Hiroshi Mogi, Yudai Fukushi, Yasushiro Nishioka

College of Science and Technology, Nihon University, Japan

Thermoelectric properties of $Ca_{0.9}Ce_{0.1}$-$xLaxMnO_3$ fabricated by tape casting process for power generation

C. M. Kim, J. W. Seo, K. Park

Faculty of Nanotechnology and Advanced Materials Engineering, Sejong University, Korea

Demonstration of High Efficiency 19.68% MOS-Structure Silicon Solar Cell Based on TiO_2/SiO_2 Space Layer and Voltage Biasing

Min-Chun Huang, Wen-Jeng Ho, Yi-Yu Lee, Zhong-Fu Hou, Jian-Jyun Liao

National Taipei University of Technology, Taiwan

Optimization of CdS buffer layer on the performance of Cu_2ZnSnS_4 solar cells

Ming-Yang Hsieh, Shou-Yi Kuo

Chang Gung University, Taiwan

A flexible glucose biofuel cell with porous polypyrrole electrodes modified with enzymes

Ryohei Sano, Tsubasa Sasaki, Shohei Koide, Hiroshi Mogi, Yudai Fukushi, Yasushiro Nishioka

College of Science and Technology, Nihon University, Japan

The Cu concentration effect on the electro-optical properties of $Cu_2ZnSnSe_4$ thin films prepared by thermal evaporation with post selenization

Yu-Ling Wei[1], Jui-Fu Yang[2], Shou-Yi Kuo[1]

[1] Chang Gung University, Taoyuan,
[2] Yuan Ze University, Taoyuan

Effect of Miniband in a Solar Cell with Quantum Dot Superlattice Fabricated with Bio-templates and Neutral Beam Etching Methods

Mohammad Maksudur Rahman[1,4], Takeru Okada[1], Noritaka Usami[2], Seiji Samukawa[1,3,4]

[1] *Institute of Fluid Science, Tohoku University, Sendai, Japan,*
[2] *Graduate School of Engineering, Nagoya University, Nagoya, Japan,*
[3] *WPI Advanced Institute for Materials Research, Tohoku University, Sendai, Japan,*
[4] *Japan Science and Technology Agency, CREST, Tokyo, Japan*

Preparation and Characterization of $CuInS_2$ thin films on ITO-coated glass substrates using the electroless plating method

Jian Ho Chen, Jhe Yu Huang

Chang Gung University, Taiwan

The efficiency enhancement of multicrystalline silicon solar cells by the incorporation of metal nanoparticle plasmonics

Zih-Yang Chen, Ming-Jer Jeng

Department of Electronic Engineering, Chang Gung University, Taiwan

Dye-sensitized solar cells prepared by the incorporation of metal nanoparticle plasmonics

Chia-Hsin Cheng, Ming-Jer Jeng

Department of Electronic Engineering, Chang Gung University, Taiwan

Carbon network supported Fe_3O_4 nanoparticles for high performance anode material Lithium-ion batteries

De Pham-Cong[1], Jung Soo Park[2], Ji Yoon Kim[3], Jae Hyun Kim[4], Chae-Ryong Cho[5]

[1] *College of Nanoscience and Nanotechnology, Pusan National University, VietNam,*
[2] *Daegu Gyeongbuk Institute of Science & Technology, South Korea,*
[3] *College of Nanoscience and Nanotechnology, Pusan National University, South Korea,*
[4] *Daegu Gyeongbuk Institute of Science & Technology, South Korea,*
[5] *College of Nanoscience and Nanotechnology, Pusan National University, South Korea*

Effect of surface roughness on electronic and thermal conductance of sub-50nm Si two dimensional system

Manoj Kumar[1], Anjana Bagga[2], Neeleshwar Sonnathi[2]

[1] *Indian Institute of Technology Delhi, New Delhi, India,*
[2] *GGS Indraprastha University, Delhi , India*

Highly transparent and flexible field emission display based on hybridized nanocarbon

Masaki Tanemura, Debasish Ghosh, Mohd Zamri Yusop, Zurita Zulkifli, Pradip Ghosh, Golap Kalita

Nagoya Institute of Technology, Japan

Synthesis of carbon nanoflakes on stainless steel substrates by RF sputtering for electron field emission application

Wen-Ching Shih, Hsuan-Chen Chang

Tatung University, Taiwan

Direct Observation of Bi-layer Graphene Field Emission Properties by In Situ TEM

Mohd Zamri Mohd Yusop[1,2], Golap Kalita[2], Yazid Yaakob[2], Saufi Rosmi[2], Masak iTanemura[2]

[1] *Department of Materials, Faculty of Mechanical Engineering, Universiti Teknologi Malaysia, 81310 UTM Skudai, Johor., Malaysia,*
[2] *Department of Frontier Materials, Nagoya Institute of Technology, Gokiso-cho, Showa-ku, 466-8555 Nagoya. , Japan*

Electron stimulated UV emission from semiconducting nanowire arrays

Chun Li, Changyong Lan

School of Optoelectronics, University of Electronic Science and Technology of China, China

New trends in NEMS/MEMS device using neutral beam etching technology

Sekhar Halubai[1], Toan Nguyen Van[2], Tomohiro Kubota[1], Takahito Ono[2], Seiji Samukawa[1,3]

[1] *Institute of Fluid Science, Tohoku University, Japan,*
[2] *Graduate School of Engineering, Tohoku University, Japan,*
[3] *WPI Advanced Institute for Materials Research, Tohoku University, Japan*

THERMAL INVESTIGATION OF MICRO-GAP THERMIONIC POWER GENERATOR OPERATED AT LOW TEMPERATURE

Remi Belbachir, Zhonglie An, Takahito Ono

Graduate School of Engineering, Tohoku University, Sendai, Miyagi, JAPAN

High photocurrent and operation frequency for light-addressable potentiometric sensor by thinner Si substrate

Tsung-Cheng Chen[1], Wei-Yin Zeng[1], Yuan-Hui Liao[2], Anirban Das[1], Chia-Ming Yang[1,2,3,4], Chao-Sung Lai[1,2,3,4]

[1] *Department of Electronic Engineering, Chang Gung University, Taiwan,*
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[3] *Healthy Aging Research Center, Chang Gung University, Taiwan,*
[4] *Center for Biomedical Engineering, Chang Gung University, Taiwan*

Electroactive Polymer Actuated Tendon Driven Micro Actuator for Robotic Application

Md Masum Billah, Raisuddin Khan, Amir Akramin Shafie, Rini Akmeliawati

International Islamic University Malaysia, Malaysia

Effects of array type of dummy active diffused region and gate geometries on narrow NMOSFETs with SiC S/D stressors

Chang-Chun Lee[1], Chia-Ping Hsieh[2], Ming-Han Liao[2], Sen-Wen Cheng[1], Yu-Huan Guo[1]

[1] *Department of Mechanical Engineering, Chung Yuan Christian University, Taiwan (R.O.C.),*
[2] *Department of Mechanical Engineering, National Taiwan University, Taiwan (R.O.C.)*

The Variability due to Random Discrete Dopant and Grain Boundary in 3D NAND Unit Cell

Jungsik Kim[1], Junyoung Lee[2], Hyeongwan Oh[2], Taiuk Rim[3], Chang-Ki Baek[3], Meyya Meyyappan[4], Jeong-Soo Lee[1,2]

[1] *Division of IT Convergence Engineering, Pohang University of Science and Technology, Republic of Korea,*
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[3] *Department of Creative IT Engineering and Future IT Innovation Lab, Pohang University of Science and Technology, Republic of Korea,*
[4] *NASA Ames Research Center, Moffett Field, USA*

Effect of Al doping on Electronic and Optical properties of ZnO by First Principles Calculations

Yu-Ren Zhu, Chieh-Cheng Chen, Hsuan-Chung Wu

Department of Materials Engineering, Ming Chi University of Technology, Taiwan

Electronic and Optical Properties of Si-doped ZnO by First Principles Calculations

Chieh-Cheng Chen, Yu-Ren Zhu, Yen-Chun Peng, Hsuan-Chung Wu

Department of Materials Engineering, Ming Chi University of Technology, Taiwan

Metal-Gate Resistance with Skin Effect Consideration in Nanoscale MOSFETs for Millimeter-Wave Ics

Sang LAM[1], Mansun CHAN[2]

[1] *Xi'an Jiaotong-Liverpool University, China,*
[2] *Hong Kong University of Science & Technology, Hong Kong, China*

Quantum energy levels simulation for InGaAs/GaAs Quantum Nanodisks fabricated by Ultimate Top-down Process

Shitanro Ishii[1], Akio Higo[2], Kenichi Yoshikawa[1], Yosuke Tamura[1,4], Takayuki Kiba[3,4], Akihiro Murayama[3,4], Yiming Li[2,5], Seiji Samukawa[1,2,3]

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[2] *WPI-AIMR, Tohoku University, Japan,*
[3] *JST-CREST, Japan,*
[4] *Graduate School of Information Science and Technology, Hokkaido University, Japan,*
[5] *Department of Electronic Engineering ,, Taiwan,*

The disordered cation distribution studies of nanosized zinc ferrite powders by synchrotron X-ray absorption spectroscopy

Thanit Tangcharoen[1,2], Wantana Klysubun[2], Chanapa Kongmark[2], Wisanu Pecharapa[1,3]

[1] College of Nanotechnology, King Mongkut' s Institute of Technology Ladkrabang (KMITL), Bangkok, 10520, Thailand,
[2] Synchrotron Light Research Institute (SLRI), Nakhon Ratchasima, 30000, Thailand,
[3] Thailand and Center of Excellence in Physics (ThEP Center), CHE, 328 SiAyutthaya Rd., Bangkok, 10400, Thailand

Numerical study on generation process of neutral beam by collison of ions against graphite surface

Tomohiro Kubota[1,2], Naoki Watanabe[3], Shingo Ohtsuka[3], Takuya Iwasaki[3], Kohei Ono[3], Yasuroh Iriye[3], Seiji Samukawa[1,2,4]

[1] Institute of Fluid Science, Tohoku University, Japan,
[2] 3D BEANS Center, BEANS Project, Japan,
[3] Mizuho Information & Research Institute, Japan,
[4] WPI-AIMR, Tohoku University, Japan

Correlations between the Fitted Threshold Voltages and the Temperature on FINFET Devices

Hsin-Chia Yang, Guan-Hao Shen, Wen-Shang Liao, Chi-Wen Chen, Sung Ching Chi

Dept. of Electronic Engineering, Minghsin University of Science & Technology, Taiwan, Taiwan

Effect of Gate Work function on Ballistic Performance of InGaSb DG-nMOSFET

Muhammad Shaffatul Islam[1], Md. Nur Kutubul Alam[2], Md. Rafiqul Islam[3]

[1] Dept. of EEE, Khulna University of Engineering & Technology (KUET), Bangladesh,
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[3] Dept. of EEE, Khulna University of Engineering & Technology (KUET), Bangladesh

Effect of Gate Oxide on Ballistic Transport of InGaSb Junctionless DG-nMOSFET

Muhammad Shaffatul Islam[1], Md. Nur Kutubul Alam[2], Md. Rafiqul Islam[3]

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[3] Department of Electrical and Electronic Engineering, Khulna University of Engineering & Technology (KUET), Bangladesh

Ballistic performance comparison of III-V XOI and Junction-less XOI nFETs

Md. Nur Kutubul Alam[1], Muhammad Shaffatul Islam[2], Md. Rafiqul Islam[3]

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Highly functionality of three-terminals nanodot array

Isamu Yoshioka[1], Hikaru Satoh[1], UchidaTakafumi[1], Akira Fujiwara[2], Masashi Arita[1], Yasuo Takahashi[1]

[1] Information Science & Technology, Hokkaido University, Japan,
[2] NTT Basic Research Laboratories, Japan

The research of Excited states in Si-SET

Hikaru Satoh[1], Takafumi Uchida[1], Isamu Yoshioka[1], Akira Fujiwara[2], Masashi Arita[1], Yasuo Takahashi[1]

[1] Information Science & Technology, Hokkaido University, Japan,
[2] NTT Basic Research Laboratories, Japan

Double-quantum-dot Si single-electron transistor with multiple gates

Takafumi Uchida[1], Isamu Yoshioka[1], Hikaru Sato[1], Masashi Arita[1], Akira Fujiwara[2], Yasuo Takahashi[1]

[1] Graduate School of Information Science and Technology, Hokkaido University, Japan,
[2] NTT Basic Research Laboratories, NTT Corporation, Japan

Using Ge interlayer and patterned substrate to improving the contact resistance of n-GaN

Ting-Wei Liao[1], Chien-Wei Chiu[2], Chieh-Hsiung Kuan[1], Tsung-Yi Huang[2], Tsung-Yu Yang[2]

[1] National Taiwan University, Taiwan,
[2] Richtek Technology Corporation, Taiwan

Electronic transition in ultra-thin $Bi_2Sr_2Co_2O_8$ nanosheets

Yang Wang

Academy of Fundamental and Interdisciplinary Sciences, Harbin Institute of Technology, China

Strain Dependence on the Nonlinear Optical Properties of Strained Si Nanoparticles

Soumen Dhara[1], Kenji Imakita[1], P. K. Giri[2], Minoru Fujii[1]

[1] Department of Electrical and Electronic Engineering, Graduate School of Engineering, Kobe University, Japan,
[2] Department of Physics, Indian Institute of Technology Guwahati, India

Photovoltaic Performance Enhancement of Plasmonics Silicon Solar Cells Using Indium Nanoparticles Embedded in Al_2O_3/ TiO_2 Layer Structure

Chi-He Lin, Wen-Jeng Ho, Yi-Yu Lee

National Taipei University of Technology, Taiwan

Ultrafast spin tunneling from a 2-dimesional electron system into self-assembled quantum dots of InGaAs

Takafumi Yamamura, Takayuki Kiba, Xiaojie Yang, Junichi Takayama, Agus Subagyo, Kazuhisa Sueoka, Akihiro Muyrayama

Hokkaido University, Japan

Electrical spin injection in light-emitting diodes with InGaAs-based quantum structures

Yuzuru Nomura, Takayuki Kiba, Junichi Takayama, Yuya Sasaki, Takafumi Yamamura, Agus Subagyo, Kazuhisa Sueoka, Akihiro Murayama

Hokkaido University, Japan

Longitudinal and transvers electron-spin relaxation times in GaAs nanodisks fabricated by bio-nano templates and damage-free neutral-beam etching

Toru Tanaka[1], Takayuki Kiba[1,4], Yosuke Tamura[2], Cedric Thomas[2,4], Akio Higo[3], Seiji Samukawa[2,3,4], Akihiro Murayama[1,4]

[1] Graduate School of Information Science and Technology, Hokkaido University, Japan,
[2] Institute of Fluid Science, Tohoku University, Japan,
[3] WPI-AIMR, Tohoku University, Japan,
[4] CREST Japan Science and Technology Agency, Japan

Effects of electric field on carrier and spin dynamics in InGaAs-based coupled quantum structures

Junichi Takayama, Takayuki Kiba, Takafumi Yamamura, Yuzuru Nomura, Agus Subagyo, Kazuhisa Sueoka, Akihiro Murayama

Hokkaido University, Japan

Ultrafast carrier capture in high optical quality GaAs nanodisks fabricated by bio-nano templates and damage-free neutral-beam etching

Takayuki Kiba[1,4], Akio Higo[2], Yosuke Tamura[3], Cedric Thomas[3,4], Seiji Samukawa[2,3,4], Akihiro Murayama[1,4]

[1] Hokkaido University, Japan,
[2] WPI-AIMR, Tohoku University, Japan,
[3] IFS, Tohoku University, Japan,
[4] JST-CREST, Japan

Nanoscale optical analysis using cathodoluminescence combined with TEM

Alan MAIGNE, David.S Stowe, Paolo Longo

Gatan Inc., U.S.A

Effect of thermal annealing on a-plane GaN grown on r-plane sapphire

Tsung-Shine Ko[1,2], Tien-Chang Lu[2], Jung-Ron Chen[2], Sin-Liang Ou[3], Chia-Ming Chang[2], Hau-Chung Kuo[1], Der Yuh Lin

[1] Department of Electronic Engineering, National Changhua University of Education, Taiwan,
[2] Department of Photonics & Institute of Electro-Optical Engineering, National Chiao Tung University, Taiwan,
[3] Department of Materials Science and Engineering, National Chung Hsing University, Taiwan

Carrier concentration dependence of band structure in catalyst-free MBE-VLS grown Si-doped GaAs nanowires on (111)Si substrate

Akio Suzuki[1], Atsuhiko Fukuyama[1], Hidetoshi Suzuki[1], Kentaro Sakai[2], Ji-Hyun Paek[3], Masahito Yamaguchi[3], Tetsuo Ikari[1]

[1] *Faculty of Engineering, University of Miyazaki, Japan,*
[2] *Center for Collaborative Research and Community Cooperation, University of Miyazaki, Japan,*
[3] *Department of Electrical Engineering and Computer Science, Nagoya University, Japan*

Optical Properties of $CuInSe_2$ Thin Films with Different Cu/In Ratio

Shou-Yi Kuo[1], Fang-I Lai[2], Pei-Jhe Liou[2], Jui-Fu Yang[2], Siang-Yi Hu[2]

[1] *Department of Electronic Engineering, Chang Gung University, Taiwan,*
[2] *Departmentof Photonics Engineering, Yuan-Ze University, Taiwan*

Wednesday, 30 July 2014

Session: CMOS-4
Time: 9:10 – 11:05
Venue: Room A
Chairs: Horng-Chih LIN & K. Radhakrishnan

【Invited】 9:10 – 9:35

Low-temperature Microwave annealing Process for future IC fabrication

Yao-Jen Lee[1], Bo-An Tsai[2], Ta-Chun Cho[2], Fu-Kuo Hsueh[1,2], Po-Jung Sung[1,2], Chiung-Hui Lai[3], Chih-Wei Luo[2], Tien-Sheng Chao[2]

[1] National Nano Device Laboratories , Taiwan,
[2] Department of Electrophysics, National Chiao-Tung University, Taiwan,
[3] Department of Electronics Engineering, Chung Hua University, Hsinchu, Taiwan

【Invited】 9:35 – 10:00

Vector soliton dynamics of graphene mode locked fiber lasers

Dingyuan Tang[1], Yufeng Song[1], Luming Zhao[2], Deyuan Shen[2]

[1] School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore,
[2] School of Physics and Electronic Engineering, Jiangsu Normal University, China

【Invited】 10:00 – 10:25

High-frequency operation of Si single-electron transistor beyond cutoff by the use of rectifying effect

Yasuo Takahashi[1], Hiroto Takenaka[1], Akira Fujiwara[2], Masashi Arita[1]

[1] Graduate School of Information Science and Technology, Hokkaido University, Japan,
[2] NTT Basic Research Laboratories, NTT Corporation, Japan

【Invited】 10:25 – 10:50

Sub-wavelength structures and their optical properties

L.Y.M.A. Tobing[1], Z.J. Xu[1], Dawei Zhang[2], K.S. Low[1], D.H. Zhang[1]

[1] School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore,
[2] School of Optical electrical and computer Engineering, University of Shanghai for Science and Technological University, China

10:50 – 11:05

TEMPERATURE DEPENDENT DELAY ANALYSIS IN MIXED CARBON NANOTUBE BUNDLE INTERCONNECT

Amandeep Kaur, Mayank Kumar Rai, Rajesh Khanna

Department of Electronics and Communication Engineering, Thapar University,Patiala-147004, India

Session: CMOS-5
Time: 11:25 – 12:45
Venue: Room A
Chairs: Tang Dingyuan & Akira Fujiwara

【Invited】 11:25 – 11:50

BEOL-Compatible Oxide-Based Transistor Technology

Horng-Chih Lin

National Chiao Tung University, Taiwan

【Invited】 11:50 – 12:15

AlGaN/GaN high electron mobility transistor structures on silicon grown by ammonia MBE

K. Radhakrishnan

Nanyang Technological University, Singapore

12:15 – 12:30

Al/Ge Simultaneous Oxidation Process using Oxygen Neutral Beam for Ge MOS Transistor

Takeo Ohno[1,2], Daiki Nakayama[3], Seiji Samukawa[1,3]

[1] WPI-AIMR, Tohoku University, Japan,
[2] PRESTO, JST, Japan,
[3] IFS, Tohoku University, Japan

12:30 – 12:45

Surface dependence of nonlinear electrical characteristics in GaAs-based three-branch nanowire junction devices

Masaki Sato[1,2], Xiang Yin[1,2], Ryota Kuroda[1,2], Seiya Kasai[1,2]

[1] Graduate School of Information Science and Technology, Hokkaido University, Japan,
[2] Research Center for Integrated Quantum Electronics, Hokkaido University, Japan

Session: **Carbon-4**
Time: 15:25 – 17:15
Venue: Room A
Chair: Tok Eng Soon

【Invited】 15:25 – 15:50

Application of Graphene to Transistors and Interconnects for Future LSIs

Shintaro Sato[1,2]

[1] Green Nanoelectronics Center, AIST, Japan,
[2] Fujitsu Laboratories Ltd., Japan

【Invited】 15:50 – 16:15

Semiconducting properties in bilayer graphene under the ultra-high displacement

Kosuke Nagashio

The University of Tokyo, Japan

16:15 – 16:30

Bottom-up graphene-nanoribbon fabrication reveals chiral edges and enantioselectivity

Patrick Han[1,2], Kazuto Akagi[1], Filippo Federici Canova[1], Hirotaka Mutoh[1], Susumu Shiraki[1], Katsuya Iwaya[3], Paul S. Weiss[1,2], Naoki Asao[1], Taro Hitosugi[1]

[1] WPI -AIMR, Japan,
[2] University of California, Los Angeles, USA,
[3] Riken, Center for Emergent Matter Science, Japan

16:30 – 16:45

Fluorographene applied as gate dielectric in MIM capacitor

Kuan-I Ho, Chao-Sung Lai

Department of Electrical Engineering, Chang Gung University, Taiwan, R.O.C

16:45 – 17:00

Tunable graphene based optics, electronics and photonics

Chun-Wei Chen

National Taiwan University, Taiwan

17:00 – 17:15

Fabrication of MoS_2 thin films by chemical vapor deposition and their device characteristics

Takashi Yanase, Sho Watanabe, Yu Hashimoto, Dai Kutsuzawa, Taro Nagahama, Toshihiro Shimada

Hokkaido University, Japan

Session: **Carbon-5**
Time: 17:40 – 19:35
Venue: Room A
Chair: Ravi Sliva

【Invited】 17:40 – 18:05

Novel Optical Properties of Carbon Nanotubes and Atomically Thin-layered Materials

Kazunari Matsuda

Kyoto University, Japan

【Invited】 18:05 – 18:30

Broadband emission and photoresponse in graphene quantum dots

Shu Ping Lau

Department of Applied Physics, The Hong Kong Polytechnic University, Hong Kong SAR, China

【Invited】 18:30 – 18:55

Engineering Metal Nanostructure for SERS Application

Yanqin Cao[1], Vguyen Viet Long[1], Masaki Tanemura[2], Masayuki Nogami[3]

[1] Shanghai Institute of Ceramics, Chinese Academy of Sciences, China,
[2] Nagoya Institute of Technology, Japan,
[3] Toyota Physical and Chemical Research Institute , Japan

【Invited】 18:55 – 19:20

Nanomaterial based enhancements to photovoltaic devices

Gehan A.J. Amaratunga

University of Cambridge

19:20 – 19:35

New origins of lasing in ZnO; temperature dependence of modal gain contour map

Chaeryoung Cho[1], Akihiro Murayama[2], Kwangseuk Kyhm[3]

[1] College of Nanoscience and Tech, Pusan national university, Republic of Korea,
[2] Graduate School of Information Science and Technology, Hokkaido University., Japan,
[3] Department of Cogno-Mechatronics Engineering, Pusan National University., Republic of Korea

Session: **Fab-3**
Time: 9:10 – 11:05
Venue: Room B
Chair: Tan Cher Ming & Taketomo Sato

【Invited】 09:10 – 9:35

Random Dopant Fluctuation in Gate-All-Around Nanowire FET

Cher Ming Tan[1], Xiangchen Chen[2]

[1] Chang Gung University, Taiwan,
[2] Nanyang Technological University, Singapore

【Invited】 09:35 – 10:00

Graphene bandgap engineering by CF_4 plasma doping and its applications

Chao Sung Lai[1], Kuan IHo[1], Ching-Yuan Su[2]

[1] Chang Gung University, Republic of China, Taiwan,
[2] National Central University, Republic of China, Taiwan

【Invited】10:00 – 10:25

Designer Ge quantum dot single electron transistor and Coulomb blockade thermometry

Pei-Wen Li, Inn-Hao Chen, Wei-Ting Lai

Department of Electrical Engineering and Center for Nano Science and Technology, Taiwan

【Invited】10:25 – 10:50

Electrochemical Formation of III-V Semiconductor Porous Nanostructures

Taketomo Sato, Yusuke Kumazaki, Akio Watanabe, Zenji Yatabe

Research Center for Integrated Quantum Electronics, Hokkaido University, Japan

10:50 – 11:05

Fabrication of High Density Sub-10nm Germanium Nanodisk Array Using Bio-template and Neutral Beam Etching for Solar Cell Application

Takuya Fujii[1,2], Takeru Okada[2], Mohd Erman Syazwan[2], Taiga Isoda[4], Hirotaka Endo[1], Mohammad Maksudur Rahman[2,3], Kohei Ito[4], Seiji Samukawa[2]

[1] HONDA R&D CO., LTD., FUNDAMENTAL TECHNOLOGY CENTER, Japan,
[2] INSTITUTE OF FLUID SCIENCE, TOHOKU UNIVERSITY, Japan,
[3] JAPAN SCIENCE AND TECHNOLOGY AGENCY, CREST, Japan,
[4] KEIO UNIVERSITY, Japan,
[5] WPI-ADVANCED INSTITUTE FOR MATERIALS RESEARCH, TOHOKU UNIVERSITY, Japan

Session: **Photo-3**
Time: 11:25 – 12:55
Venue: Room B
Chair: Akihiro Murayama

【Invited】11:25 – 11:50

Defect-enabled spin functionality: a new approach for room-temperature semiconductor spintronics and spin-photonics

Weimin Chen, Irina Buyanova

Department of Physics, Chemistry and Biology, Linköping University, Sweden

【Invited】11:50 – 12:15

Optical control and measurement of spins in self-assembled quantum dots

Jonathan James Finley, K. Müller, A. Bechtold, P-L. Ardelt, D. Rauch, A. Kleinkauf, T. Simmet

Walter Schottky Institut - Centre for Nanotechnology and Nanomaterials TU-München, Am Coulombwall 4, 85748 Garching, Germany

【Invited】12:15 – 12:40

Excitonic Aharonov-Bohm Effect in a Single Quantum Ring

Kwangseuk Kyhm

Pusan National University, Korea

12:40 – 12:55

Quantum Well Infrared Photodetector (QWIP) With Optimal 1-D Grating Structure To Enhance The Performance

Shih-Hung Lin[1], Ming-Lun Lee[2], Chieh-Hsiung Kuan[2]

[1] Department of Biomedical Engineering, Hung Kuang University, Taichung City 43302, Taiwan,
[2] Graduate Institute of Electronics Engineering, National Taiwan University, Taipei City 10617, Taiwan

Session: **Memory - 1**
Time: 15:25 – 17:30
Venue: Room B
Chair: Toshitsugu Sakamoto

【Invited】 15:25 – 15:50

Ultra low power of artificial cognitive memory for brain-like computation

Lei Deng, Ziyang Zhang, Jing Pei, Luping Shi

Department of Precision Instrument, Tsinghua University, China

【Invited】 15:50 – 16:15

Topological Switching Nonvolatile Memory (TRAM) using $[(GeTe)_x(Sb_2Te_3)_y]_n$ Phase Change Superlattice Structures

Junji Tominaga

National Institute of Advanced Industrial Science & Technology (AIST), Japan

【Invited】 16:15 – 16:40

Process and device technologies of topological-switching random-access memory (TRAM)

Norikatsu Takaura

Low-power Electronics Association & Project (LEAP), Japan

【Invited】 16:40 – 17:05

Effects of Plasma Treatment on Gadolinium Oxide Resistive Switching Memory

Jer-Chyi Wang[1], Yu-Ren Ye[1], Chih-Hsien Hsu[1], Ying-Huei Wu[1], Chi-Fong Ai[2], Wen-Fa Tsai[2]

[1] Department of Electronic Engineering, Chang Gung University, Taiwan,
[2] Institute of Nuclear Energy Research, Atomic Energy Council, Taiwan

【Invited】 17:05 – 17:30

Density functional study on the structures of conductive filaments and ion migration behaviors in tantrum-oxide-based resistive switching devices

Satoshi Watanabe, Bo Xiao

Department of Materials Engineering, The University of Tokyo, Japan

Session: **Energy-3**
Time: 17:40 – 19:15
Venue: Room B
Chair: Kosuke Hara

【Invited】 17:40 - 18:05

Advanced Hydride Research for Hydrogen and Electrochemical Energy Storage

Shin-ichi Orimo

WPI Advanced Institute for Materials Research (WPI-AIMR) / Institute for Materials Research, Tohoku University, Japan

【Invited】 18:05 - 18:30

Large Scale Molecular Dynamics Simulations for Transport Phenomena of Materials in Polymer Electrolyte Fuel Cell

Takashi Tokumasu

Institute of Fluid Science, Tohoku University, Japan

18:30 - 18:45

First Principles Analysis of Proton Conduction Behavior in Electrolytes of Protonic Ceramic Fuel Cells

Kazuaki Toyoura[1], Atsutomo Nakamura[1], Katsuyuki Matsunaga[1,2]

[1] Nagoya University, Japan,
[2] Japan Fine Ceramics Center, Japan

18:45 – 19:00

Characteristics of Molecular Cluster Ion Compounds as Cathode Electrode Materials for Lithium Battery

Noriyuki Sonoyama, Erfu Ni, Shinya Uematsu

Nagoya Institute of Technology, Japan

19:00 – 19:15

Flexible dye-sensitized solar cells from titanium oxide nanoparticles

Tetsuo Soga, Kosuke Ezaka, Tomoyuki Yamamura, Takuma Yasufuku, Naoki Kishi

Nagoya Institute of Technology, Japan

Session: **Model-2**
Time: 9:10 – 11:05
Venue: Room C
Chair: Blanka Magyari Kope

【Invited】 9:10 – 9:35

Modeling of CdTe Solar Cells: The Role of Cu

Dragica Vasileska

School of Electrical, Computer and Energy Engineering Arizona State University, Tempe, AZ 85287-5706, USA

【Invited】 9:35 – 10:00

Quantum transport simulation of statistical variability in nano-scale MOSFETs

Nobuya Mori[1,4], Gennady Mil'nikov[1,4], Yoshinari Kamakura[1,4], Tomofumi Zushi[2], Takanobu Watanabe[2], Masashi Uematsu[3], 4, Kohei Mitoh[3,4]

[1] Osaka University, Japan,
[2] Waseda University, Japan,
[3] Keio University, Japan,
[4] CREST, JST, Japan

【Invited】 10:00 – 10:25

Theoretical Study of Silicene

Kenji Shiraishi

Kanagawa Institute of Technology, Japan

【Invited】 10:25 – 10:50

Theoretical studies of graphene on SiC

Hiroyuki Kageshima[1,2], Hiroki Hibino[2], Hiroshi Yamaguchi[2], Masao Nagase[3]

[1] Shimane University, Japan,
[2] NTT Basic Research Laboratories, Japan,
[3] University of Tokushima, Japan

10:50 – 11:05

Design of a NMR microprobe with provision for keeping the biological sample micro-units away from a cryogenically cooled planar micro-coil at a viable temperature to improve the SNR of NMR experiment at micro dimensions

Zishan Ali Syed Mohammed, Xintong Zhu, Poenar Daniel Puiu, Sheel Aditya

School of EEE, Nanyang Technological University, Singapore

Session: **Model-3**
Time: 11:25 – 12:55
Venue: Room C
Chair: Kenji Shiraishi

【Invited】 11:25 – 11:50

Simulation of Filamentary Switching in Binary Metal Oxide Based RRAM devices

Blanka Magyari-Kope[1], Liang Zhao[1], Katsumasa Kamiya[2], Moon Young Yang[3], Kenji Shiraishi[4], Yoshio Nishi[1]

[1] Department of Electrical Engineering, Stanford University, US,
[2] Center for Basic Education and Integrated Learning, Kanagawa Institute of Technology, Japan,
[3] Graduate School of Pure and Applied Sciences, University of Tsukuba, Japan,
[4] Graduate School of Engineering, Nagoya University, Japan

【Invited】 11:50 – 12:15

Theory of high efficiency photoelectric conversion in carbon nanotubes

Satoru Konabe

University of Tsukuba, Japan

【Invited】 12:15 – 12:40

Ab Initio Modeling of Nanobiomolecules

Katsumasa Kamiya

Kanagawa Institute of Technology, Japan

12:40 – 12:55

Impact of Image Force Effect on Gate-All-Around Schottky Barrier Tunnel FET

Shuichiro Hashimoto[1], Hiroki Kosugiyama[1], Kohei Takei[1], Sung Jing[1], Yuji Kawamura[1], Yasuhiro Shikahama[1], Kenji Ohmori[2], Takanobu Watanabe[1]

[1] Faculty of Science and Engineering, Waseda University, Japan,
[2] Graduate School of Pure and Applied Sciences, University of Tsukuba, Japan

Session: **Spin-2**
Time: 15:25 – 17:20
Venue: Room C
Chair: Shinobu Fujita

【Invited】 15:25 – 15:50

Bio-magnetic field sensor application of magnetic tunnel junctions

Yasuo Ando[1], Takuo Nishikawa[2], Kousuke Fujiwara[1], Daiki Kato[1], Mikihiko Oogane[1], Hiroshi Naganuma[1]

[1] Department of Applied Physics, Graduate School of Engineering, Tohoku University, Japan,
[2] Corporate R&D Headquarters, KONICA MINOLTA, INC., Japan

【Invited】 15:50 – 16:15

Magnetic domain wall motion and spin-orbit torque induced magnetization switching for three-terminal spintronics devices

Shunsuke Fukami[1,2], Chaoliang Zhang[3], Hideo Ohno[1,2,3,4]

[1] CIES, Tohoku University, Japan,
[2] CSIS, Tohoku University, Japan,
[3] Laboratory for Nanoelectronics and Spintronics, RIEC, Tohoku University, Japan,
[4] WPI-AIMR, Tohoku University, Japan

【Invited】 16:15 – 16:40

Novel approach to investigate spin-polarization in half-metallic Heusler compounds via anisotropic magnetoresistance effect

Yuya Sakuraba[1], Satoshi Kokado[2], Yusuke Hirayama[1], Takao Furubayashi[1], Hiroaki Sukegawa[1], Songtian Li[1], Yukiko Takahashi[1], Kazuhiro Hono[1]

[1] National Institute for Materials Science (NIMS), Japan,
[2] Graduate School of Engineering, Shizuoka University, Japan

【Invited】 16:40 – 17:05

Nanoscale microwave generator using a magnetic tunnel junction

Hitoshi Kubota, Kay Yakushiji, Sumito Tsunegi, Makoto Konoto, Shingo Tamaru, Akio Fukushima, Tomohiro Taniguchi, Hiroko Arai, Hiroshi Imamura, Shinji Yuasa

National Institute of Advanced Industrial Science and Technology (AIST), Japan

17:05 – 17:20

Behavior of Magnetic Domains in [Co/Pd] Nanowires with Periodic Battlement Shaped Notches by Nanoimprint Lithography

Mitsunobu Okuda[1,2], Yasuyoshi Miyamoto[1], Eiichi Miyashita[1], Nobuo Saito[1], Naoto Hayashi[1], Shigeki Nakagawa[2]

[1] Science & Technology Research Labs., NHK, Japan,
[2] Tokyo Institute of Technology, Japan

Session: **Spin-3**
Time: 17:40 – 19:45
Venue: Room C
Chair: Eiji Saitoh

【Invited】 17:40 – 18:05

Silicon Spintronics

Ron Jansen

AIST, Tsukuba, Japan

【Invited】 18:05 – 18:30

Future Prospects of advanced STT-MRAM for Normally-off Processors (Ultra-low-power Mobile Processor Applications).

Naoharu Shimomura, Shinobu Fujita, Junichi Ito, Eiji Kitagawa, Daisuke Saida, Tadaomi Daibou, Yushi Kato, Chikayoshi Kamata, Yuichi Oosawa, Hiroki Noguchi, Hiroaki Yoda

Toshiba Corp., Japan

【Invited】 18:30 – 18:55

Spin injection, detection and local magnetoresistance through Si at room temperature in ferrmagnet/MgO/SOI lateral spin valves

Yoshiaki Saito[1], Mizue Ishikawa[1], Hideyuki Sugiyama[1], Tomoaki Inokuchi[1], Tetsufumi Tanamoto[1], Nobuki Tezuka[2], Kohei Hamaya[3]

[1] Toshiba Corporation, Japan,
[2] Tohoku University, Japan,
[3] Osaka University, Japan

【Invited】 18:55 – 19:20

Critical role of defect control for half-metallicity of Co-based Heusler alloy thin films

Masafumi Yamamoto

Graduate School of Information Science and Technology, Hokkaido University , Japan

【Invited】 19:20 – 19:45

Highly efficient spin injection and dynamic nuclear polarization using a half-metallic spin source.

Tetsuya Uemura

Hokkaido University, Japan

Poster Session 2
Time: 19:35 – 20:55
Venue: Lobby & Room E

Ambipolar Carrier Injection of Gold Nanocrystal Nonvolatile Memory with Different Tunneling Oxide Thickness

Yu-Hua Liu, Chin-Hsiang Liao, Chih-Ting Lin, Jer-Chyi Wang
Department of Electronic Engineering, Chang Gung University, Taiwan

Resistance switching of WOx prepared by reactive sputtering at room temperature

Akitoshi Nakane[1], Takahiro Hiroi[1], Masaki Kudo[1], Masashi Arita[1], Hideyuki Ando[1], Takashi Morie[2], Yasuo Takahashi[2]
[1] *IST, Hokkaido Univ., Japan,*
[2] *Kyushu Inst Technol, Japan*

Study on in-situ TEM observation of WOx ReRAMs with Cu top electrodes

Akihito Takahashi, Yuuki Ohno, Masaki Kudo, Akitoshi Nakane, Masashi Arita, Yasuo Takahashi
Information Science & Technology, Hokkaido University, Japan

Switching characteristics of Cu-MoOx ReRAM

Takahiro Hiroi[1], Akitoshi Nakane[1], Takashi Fujimoto[1], Masashi Arita[1], Hideyuki Ando[2], Takashi Morie[2], Yasu Takahashi[1]
[1] *Information Science & Technology, Hokkaido University, Japan,*
[2] *Kyushu Inst, Technology, Japan*

Real time transmission electron microscopy observation of Cu / MoOx ReRAMs

Masaki Kudo, Yuuki Ohno, Takahiro Hiroi, Kouichi Hamada, Masashi Arita, Yasuo Takahashi
Graduate School of Information Science and Technology, Hokkaido University, Japan

Manganese and Iron Cobaltite Ternary Mixed-Metal Oxides as High Performance Anode Materials for Li Ion Batteries and supercapacitors

Chih-Jung Chen[1], Chih Kai Chen[1], Shu-FenHu[3], Ru ShiLiu[1]
[1] *Department of Chemistry, National Taiwan University, Taipei 106, Taiwan, Taiwan,*
[2] *Nanoscience and Technology Program, Taiwan International Graduate Program, Institute of Physics, Academia Sinica, Taipei 115, Taiwan, Taiwan,*
[3] *Department of Physics, National Taiwan Normal University, Taipei 116, Taiwan, Taiwan*

Carrier Transport Properties of the $Lu_3N@C_{80}$/Au Interface

Naoto Ogawa[1], Kenta Kirimoto[1], Syogo Hatake[2], Masamichi Sakaino[2], Tsuyoshi Takase[2], Yong Sun[2]
[1] *Kitakyushu National College of Technology, Japan,*
[2] *Kyushu Institute of Technology, Japan*

Wearable and flexible pH sensor with conductive polymer of nano- PEDOT/PSS particle

Teng-Wei Juan[1], Ming-Yang Shih[1], Chen-Ting Yeh[2], Chia-Ming Yang[2], Mu-Yi Hua[3], Chao-Sung Lai[1]
[1] *Department of Electronic Engineering, Chang Gung University, Taiwan,*
[2] *Institute of Electro-Optical Engineering, Chang Gung University, Taiwan,*
[3] *Department of Chemical and Materials Engineering, Chang Gung University, Taiwan*

Ampacity and electrical properties of thermally treated ultrathin carbon membranes grown by focused ion beam induced deposition of phenanthrane

Gemma Rius[1], Marc Sansa[2], Xavier Borrise[2], Francesc Perez-Murano[2], Masamichi Yoshimura[3], Narcis Mestres[4]
[1] *Nagoya Institute of Technology, Japane,*
[2] *Institut de Microelectronica de Barcelona, Spain,*
[3] *Toyota Technological Institute, Japan,*
[4] *Institute de Ciencia de Materials, Spain*

Coherent Electronic Transport in Edge-Disordered Graphene Nanoribbons

Kengo Takashima[1], Hiromu Fujii[1], Takahiro Yamamoto[1,2]

[1] *Department of Electrical Engineering, Tokyo University of Science , Japan,*
[2] *Department of Liberal Arts, Tokyo University of Science, Japan*

Electrocatalysts of Formic Acid Oxidation by One-Pot Synthesis of PtFe Nanoparticles on PDDA-modified-Graphene

Ting-Yu Liu[1], Li-Ying Huang[2], Tzu-Yi Chan[1], Tung-Yuan Yung[3, 4, 5], Ling-Kang Liu[5]

[1] *Department of Materials Engineering, Ming Chi University of Technology, New Taipei City 24301, Taiwan, Taiwan,*
[2] *Department of Materials Science and Engineering, National Taiwan University of Science and Technology, Taipei 106, Taiwan, Taiwan,*
[3] *Nuclear Fuels and Materials Division, Institute of Nuclear Energy Research, Taoyuan 325, Taiwan, Taiwan,*
[4] *Department of Physics, National Central University, Jhongli, Taoyuan 320, Taiwan, Taiwan,*
[5] *Taiwan International Graduate Program, Molecular Science and Technology, Institute of Chemistry, Academia Sinica, Nangkang, Taipei 115, Taiwan, Taiwan*

Conductive DLC deposition by NBECVD for application of Bio-LSI

Xijiang Chang[1], Yoshiyuki Kikuchi[1,2], Tomohiro Kubota[1], Kumi Y. Inoue[3], Tomokazu Matsue[3,4,5], Seiji Samukawa[1,5]

[1] *Institute of Fluid Science, Tohoku Univ., Japan,*
[2] *Tokyo Electron Limited, Japan,*
[3] *Graduate School of Environmental Studies, Tohoku Univ., Japan,*
[4] *μSIC, Tohoku Univ., Japan,*
[5] *WPI-AIMR, Tohoku Univ., Japan*

Neutral beam induced nitridation of multi-layer graphene

Takeru Okada[1], Seiji Samukawa[1,2]

[1] *Institute of Fluid Science, Tohoku University, Japan,*
[2] *WPI-AIMR, Tohoku University, Japan*

First-principles study on formation of atomically precise graphene nanoribbons

Tomoaki Kaneko[1,2], NobuoTajima[1,2], TakahisaOhno[1,2,3]

[1] *National Institute for Materials Science, Japan,*
[2] *MARCEED, Japan,*
[3] *Institute of Industrial Science, Univ. of Tokyo, Japan*

Electron transport in graphene under c-HfO_2(111): first-principles analysis

Tomoaki Kaneko[1,2], Takahisa Ohno[1,2,3]

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[2] *MARCEED, Japan,*
[3] *Institute of Industrial Science, Univ. of Tokyo, Japan*

Bio-Template and Neutral Beam Etching Technique applied for Germanium Nanowires Fabrication

Moahmed-Tahar Chentir[1], Takeru Okada[1], Naoyuki Kawai[2], Kazumi Wada[2], Seiji Samukawa[1,3,4]

[1] *Institute of Fluid Science, Tohoku University, Japan,*
[2] *Dept. of Materials Eng. Graduate School of Eng., The University of Tokyo, Japan*
[3] *WPI-Advanced Institute for Materials Research, Tohoku University, Japan,*
[4] *CREST Japan Science and Technology Agency, Japan*

Synthesis of large graphene domains on copper foil using solid waste plastic as a carbon source

Remi Papon, Golap Kalita, Subash Sharma, Sachin Shinde, Masaki Tanemura

Nagoya Institute of Technology, Japan

Graphene dots fabrication by a bio-template and a neutral beam etching

Koki Igarashi[1], Takeru Okada[1], Patrick Han[2], Katsuaki Sugawara[2], Taro Hitosugi[2], Seiji Samukawa[1,2]

[1] *Institute of Fluid Science, Tohoku University, Japan,*
[2] *WPI-AIMR, Tohoku University, Japan*

Evaluation of potential variation around grain boundaries in $BaSi_2$ on poly-crystalline Si substrates

Masakazu Baba[1], Weijie Du[1], Ryota Takabe[1], Kaoru Toko[1], Kentaro Watanabe[1], Takashi Sekiguchi[2], Kosuke O. Hara[3], Noritaka Usamai[3,4], Takashi Suemasu[1,4]

[1] *University of Tsukuba, Japan,*
[2] *National Institute for Materials Science, Japan,*
[3] *University of Nagoya, Japan,*
[4] *JST-CREST, Japan*

Study on optical properties of indium doeped ZnO nanowires

Tsung-Shine Ko[1], Sin-Liang Ou[2], Kuo-Sheng Kao[3], Der Yuh Lin[1]

[1] *Department of Electronic Engineering, National Changhua University of Education, Taiwan,*
[2] *Department of Materials Science and Engineering, National Chung Hsing University, Taiwan,*
[3] *Department of Computer and Communication, SHU-TE University, Taiwan*

Tailoring the physical properties of (Ba, Ca)(Ti, Zr)O_3 - Sm_2O_3 heteroepitaxial nanocomposite films

Qianru Lin, Dennis Lund Lorenzen, Danyang Wang

School of Materials Science and Engineering, The University of New South Wales, Australia

Enhanced spin-orbit interaction in the hydrogenated Graphene

Keita Konishi[1], Takao Miyamoto[1], Zhixin Cui[1], Tomotsugu Ishikura[1], Kanji Yoh[1], Akihiro Hashimoto[2]

[1] *RCIQE Hokkaido University, Japan,*
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Growth and characterization of transport properties of <110>-oriented InAs nanowires

Zhixin Cui, RAJA GEMBUPERUMAL, Tomotsugu Ishikura, Keita Konishi, Kanji Yoh, Junichi Motohisa

RCIQE, Hokkaido University, Japan

Physical properties of Ti-doped ITO Nanoparticles Synthesized by Co-precipitation Method

Krisana Chongsri[1], Jiruntanin Kanoksinwuttipong[2], Wichan Techitdheera[2], Wisanu Pecharapa[3,4]

[1] *Department of Applied Physics, Faculty of Science and Technology, Rajabhat Rajanagarindra University, , Thailand,*
[2] *School of Applied Physics, King Mongkut' s Institute of Technology Ladkrabang, Thailand,*
[3] *College of Nanotechnology, King Mongkut' s Institute of Technology Ladkrabang, Thailand,*
[4] *ThEP Center*

Photocatalytic activity and dye-sensitized solar cell performance of Cu-doped ZnO nanopowders

Kankanit Phiwdang[1], Krisana Chongsri[2], Wanichaya Mekprasart[1], Wisanu Pecharapa[1,3]

[1] *College of Nanotechnology, King Mongkut' s Institute of Technology Ladkrabang, Thailand,*
[2] *Department of Applied Physics, Faculty of Science and Technology, Rajabhat Rajanagarindra University, , Thailand,*
[3] *ThEP Center, Thailand*

Structural transformation of Si-incorporated carbon nanofiber studied by in situ TEM

Yazid Yaakob[1,2], Mohd. Zamri Mohd. Yusop[1,3], Yu Kuwataka[1], Chisato Takahashi[1], Golap Kalita[1], Masaki Tanemura[1]

[1] *Nagoya Institute of Technology, Japan,*
[2] *Universiti Putra Malaysia, Malaysia,*
[3] *Universiti Teknologi Malaysia, Malaysia*

Nanostructured Graphene-Cobalt Manganese Oxide Hybrids for Biosensor Applications

Chun-Hu Chen, Wen-Jie Lan, Cheng-Chi Kuo

National Sun Yat-sen University, Taiwan (ROC)

In Site Transmission Electron Microscopy Observation of Structual Changes in Cu-deposited Carbon Nanofiber AtHigh Current Flow

Mohamad Saufi Rosmi[1,2], Yazid Yaakob[1,3], Mohd ZamriMohd Yusop[1,4], Golap Kalita[1], Masaki Tanemura[1]

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[3] *Department of Physics, Faculty of Science, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia,*
[4] *Department of Materials, Faculty of Mechanical Engineering, Universiti Teknologi Malaysia, 81310 UTM Skudai, Johor, Malaysia*

Configuration Dependence of Color Center Luminescence in Porous Anodic Aluminium Oxide Grown on Si Substrates

Bing-Yuh Lu[1], Yi-jen Huang[2], Jui-ju Hsiao[2], Hung-Ing Chen[2], Jen-Cheng Wang[2], Chia-Hui Fang[2], Ya-Fen Wu[3], Tzer-En Nee[2]

[1] *Tungnan University, Taiwan,Republic of China,*
[2] *Chang Gung University, Taiwan,Republic of China,*
[3] *Ming Chi University of Technology, Taiwan ,Republic of China*

Structure and behavior of Zinc oxide grown on FTO substrates

Bing-Yuh Lu[1], Shin-Huang Tsai[2], Hung-Ing Chen[2], Chia-Hui Fang[2], Jui-Ju Hsiau[2], Yi-Jen Huang[2], Jen-Cheng Wang[2], Tzer-En Nee[2]

[1] *Tungnan University, Taiwan ,Republic of China,*
[2] *Chang Gung University, Taiwan ,Republic of China,*

Cu_2-xSe nanoparticles for thernoelectric application

Rajesh Kumar[1], B Khasimsaheb[1], B Shivaiah[2], Ajay Dhar[2], Sonnathi Neeleshwar[1]

[1] *GGS Indraprastha University , Delhi, India,*
[2] *CSIR-National Physical Laboratory, Delhi, India*

Nano and micro morphological modification for the improvement of interfacial strength of bi-merials of CFRP/Aluminum

Jung Ju Lee[1], Won Seok Kim[2], Kum Cheol Shin[3], Ju Won Jeong[1], Sang Young Kim[1]

[1] *KAIST (Korea Advanced Institute of Science and Technology), South Korea,*
[2] *KAI (Korea Aerospace Industries), South Korea,*
[3] *Shin Ansan University, South Korea,*

Performance Enhancement of Thin-Film Silicon Solar Cells with Nanoporous surface Structure and TiO_2 Passivation layer Based on Optimal Light Trapping and Surface Recombination Reducing

Po-Hung Tsai[1], Wen-Jeng Ho[1], Chia-Min Chang[1], Hung-Chang Hus[2], Ching-Fuh Lin[2]

[1] *National Taipei University of Technology, Taiwan,*
[2] *National Taiwan University, Taiwan*

Prediction of plasma etching profile using on-wafer monitoring system

Tomohiro Kubota[1], Michio Sato[2], Takuya Iwasaki[3], Kohei Ono[3], Seiji Samukawa[1,4]

[1] *Institute of Fluid Science, Tohoku University, Japan,*
[2] *Harada Corporation, Japan,*
[3] *Mizuho Information & Research Institute, Japan,*
[4] *WPI-AIMR, Tohoku University, Japan*

GaAs/AlGaAs quantum nanodisks by using neutral beam etching and their optical response

Yosuke Tamura[1], Akio Higo[2], Takayuki Kiba[3], Cedric Thomas[1,6], Takeru Okada[1], Wang Yunpeng[4], Hassanet Sodabanlu[4], Masakazu Sugiyama[5], Yoshiaki Nakano[5], Akihiro Murayama[3,6], Seiji Samukawa[1,2,6]

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[6] *CREST Japan Science and Technology Agency, Japan*

Optical characteristics of GaAs Quantum Nanodisks by the Combination of Bio-template Ultimate Top-down process

Akio Higo[1], Takayuki Kiba[2,4], Yosuke Tamura[3], Shintaro Ishii[3], Cedric Thomas[3,4], Takuya Ozaki[3], Akihiro Murayama[2,4], Seiji Samukawa[1,3,4]

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[2] *Hokkaido University, Japan,*
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Low Temperature InGaAs Oxidation Process using Defect-Free Neutral Beam Technology with Various Indium Concentrations

Chang Yong Lee[1,3], Akio Higo[2], Cédric Thomas[1,3], YosukeTamura[1,3], Seiji Samukawa[1,2,3]

[1] *Institute of Fluid Science, Tohoku University, Japan,*
[2] *World Premier International Center Initiative Advanced Institute for Materials Research, Tohoku University, Japan,*
[3] *CREST Japan Science and Technology Agency , Japan*

Fundamental mechanisms of neutral beam etching for III-V quantum dots fabrication

Cedric Thomas[1,2], Yosuke Tamura[1,2], Takeru Okada[1], Akio Higo[3], Seiji Samukawa[1,2,3]

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Fabrication of Cu nanogaps by electromigration and its application

Ryota Yonesaka, Hayato Ochi, Yohsuke Murakami, Masashi Arita, Yasuo Takahashi

Information Science & Technology, Hokkaido University, Japan

Investigation of single focused Ga+ beam spot milling and its superimposition behavior

Hung-Ming Chen[1], Pei-Jia Wu[2], Kuan-Yuan Shen[1], Chieh-Hsiung Kuan[1,2]

[1] *Graduate Institute of Electronics Engineering, National Taiwan University, Taiwan,*
[2] *Graduate Institute of Biomedical Electronics and Bioinformatics, National Taiwan University, Taiwan*

Fabrication of InGaAs quantum nanodisk by using Bio-template and neutral beam etching processes

Kenichi Yoshikawa[1], Akio Higo[2], Chang Yong Lee[1], Yosuke Tamura[1,7], Cedric Thomas[1,7], Takayuki Kiba[3,7], Shintaro Ishii[1], Hassanet Sodabanlu[4], Yunpeng Wang[4], Masakazu Sugiyama[6], Yoshiaki Nakano[6], Ichiro Yamashita[5], Akihiro Murayama[3], Seiji Samukawa[1,2,7]

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[6] *School of Engineering, The Univ. of Tokyo, JAPAN,*
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In-situ observation of electromigration-induced atomic steps movement

Yosuke Murakami, Ryouta Yonesaka, Kouichi Hamada, Masashi Arita, Yasuo Takahashi

Graduate School of IST, Hokkaido University, Japan

Applying grounded hardware structures to suppress proximity effect and charging effect in e-beam lithography.

Shao-Wen Chang1, Kuan-Yuan Shen[1], Chieh-HsiungKuan[1,2]

[1] *Graduate Institute of Electronics Engineering, National Taiwan University, Taiwan,*
[2] *Graduate Institute of Biomedical Electronics and Bioinformatics, National Taiwan University, Taiwan*

Investigation of Lateral Development Rate to Reduce Proximity Effect in e-Beam Lithography

Kuan-Yuan Shen[1], Shao-Wen Chang[1], Hsiu-Yun Yeh[2], Hung-Ming Chen[1], Chieh-Hsiung Kuan[1]

[1] *Graduate Institute of Electrical Engineering, National Taiwan University, Taiwan (R.O.C.),*
[2] *Graduate Institute of Photonics and Optoelectronics, National Taiwan University, Taiwan (R.O.C.)*

Characterization of body effect of Au-EGFET for KRAS gene detection

Hui-Hsin Chang[1], Yi-Ting Lin[1], Chai-Ming Yang[2], Ji-dung Luo[3], Chiuan-Chian Chiou[3], Chao-Sung Lai[1]

[1] Department of Electronic Engineering, Chang Gung University, Taiwan,
[2] Institute of Electro-Optical Engineering, Chang Gung University, Taiwan,
[3] Department of Medical Biotechnology and Laboratory Science, Chang Gung University, Taiwan

Structural control of GaN porous structures for high-sensitive chemical sensors

Akio Watanabe, Yusuke Kumazaki, Zenji Yatabe, Taketomo Sato

Research Center for Integrated Quantum Electronics, Hokkaido University, Japan

Extended titanium nitride gate field-effect transistor with PVC selective membarane for hydrogen and potassium ion detection

Hau-Cheng Wang[1], Tsung-Cheng Chen[1], Hao Yang[1], Teng-Wei Juan[1], Pi-Chun Juan[2], Chia-Ming Yang[3], Chao-Sung Lai[1]

[1] Department of Electronic Engineering, Chang Gung University, Taiwan,
[2] Department of Materials, Ming Chi University of Technology, Taiwan,
[3] Institute of Electro-Optical Engineering, Chang Gung University, Taiwan

Development of damage-free neutral beam processes for future nano-devices

Takuya Ozaki[1], Takeru Okada[1], Tomohiro Kubota[1], Seiji Samukawa[1,2]

[1] Institute of Fluid Science, Tohoku University, Japan,
[2] WPI-AIMR, Tohoku University, Japan

Magnetoresistance and microstructure of Fe-MgF_2 single layer granular films

Tokihiro YOKONO, Eita SATO, Yousuke MURAKAMI, Masashi ARITA, YasuoTAKAHASHI

IST HOKKAIDO UNIV., Japan

Enhanced spin injection from ferromagnet into InAs through MgO tunnel barrier

Tomotsugu Ishikura[1], Zhixin Cui[1], Keita Konishi[1], Kanji Yoh[1], Tetsuya Uemura[2]

[1] RCIQE, Hokkaido Univ., JAPAN,
[2] Graduate School of Information Science and Technology, Hokkaido Univ., JAPAN

Thursday, 31 July 2014

Session: **CMOS-6**
Time: 9:10 – 10:45
Venue: Room A
Chairs: Enrico Prati & Tang Dingyuan

【Invited】 9:10 – 9:35

Stochastic Resonance and Related Phenomena in Nonlinear Electron Nanodevices
Seiya Kasai
Hokkaido University, Japan

【Invited】 9:35 – 10:00

Advanced FinFET Device Technology
Kazuhiko Endo, S. O'uchi, T. Matsukawa, Y. Liu, M. Masahara
National Institute of Advanced Industrial Science and Tecnology (AIST), Japan

10:00 – 10:15

Junctionless Composite Transistor for Ultra Low Power Logic Applications
Anand Kumar, Mukta Singh Parihar, Abhinav Kranti
Low Power Nanoelectronics Research Group, Electrical Engineering Discipline, Indian Institute of Technology Indore, India

10:15 – 10:30

Modeling and Simulation of Small Signal Model of CNTFET
Soheli Farhana, AHM Zahirul Alam, Sheroz Khan
International Islamic University Malaysia, Malaysia

10:30 – 10:45

Boosting of ON current using spacer and charge plasma concept.
Ishu Agrawal[1], P. N KONDEKAR[2]
[1] STUDENT, INDIA,
[2] PROFESSOR, INDIA

Session: **CMOS-7**
Time: 11:25 – 12:30
Venue: Room A
Chair: Kazuhiko Endo

【Invited】 11:25 – 11:50

The 10-Year SET Odyssey for the Room-Temperature Multi-Switching Nanotransistor
Jung-Bum Choi
Chungbuk National University, Korea

【Invited】 11:50 – 12:15

Atomic scale nanoelectronics for quantum neuromorphic devices
Enrico Prati
Consiglio Nazionale delle Ricerche – Istituto di Fotonica e Nanotecnologie, Italy

12:15 – 12:30

InGaSb Junctionless DG-nMOSFET : A Quantum Transport study at Gate Length down to 5 nm and 7 nm

Muhammad Shaffatul Islam, Md. Nur Kutubul Alam, Md. Rafiqul Islam

Department of Electrical and Electronic Engineering, Khulna University of Engineering & Technology (KUET), Bangladesh

Session: **Energy-4**
Time: 9:10 – 10:45
Venue: Room B
Chair: Tetsuo Soga

9:10 – 9:25

The Effect of Selenization Process on the Photoelectrochemical Performance of CIGSe Thin Films

Shu-Kai Chang, Yu-Hsiang Wu

Chang Gung University, Taiwan

9:25 – 9:40

The Photoelectrochemical Performances of Silver-Tin-Sulfide Thin Films Created Using Chemical Bath Deposition

Lin-Ya Yeh, Kong-Wei Cheng

Chang Gung University- Department of Chemical and Materials Engineering, Taiwan, Tao-Yuan

【Invited】 9:40 – 10:05

Design, fabrication and characterization of thin film monocrystalline-silicon solar cells with efficient light trapping

Alain Fave[1,2], Loic Lalouat[1,2,3], Xianqin Meng[5], Guillaume Gomard[6], Christos Trompoukis[4], Romain Champory[1,2,3], Ounsi El Daif[4], Valérie Depauw[4], Emmanuel Drouard[1,3], Fabien Mandorlo[1,2], Christian Seassal[1,3]

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[2] *INSA de Lyon, Bat. Blaise Pascal, 7 Avenue Capelle, 69621, Villeurbanne, France,*
[3] *Ecole Centrale de Lyon, 36 Avenue Guy de Collongue, 69134, Ecully, France,*
[4] *Imec, Kapeldreef 75, 3001 Leuven, Belgium,*
[5] *Presently at McMaster University, 1280 Main Street West, L8S 4L7, Hamilton, Ontario, Canada,*
[6] *Presently at Light Technology Institute (LTI), Karlsruhe Institute of Technology (KIT), 76131 Karlsruhe, Germany*

10:05 – 10:20

Arsenic Doping into BaSi2 semiconductor films by ion implantation and thermal annealing

Kosuke O.Hara[1,2], Noritaka Usami[1,2], Masakazu Baba[3], Kaoru Toko[3], Takashi Suemasu[2,3]

[1] *Nagoya University, Japan,*
[2] *JST-CREST, Japan,*
[3] *University of Tsukuba, Japan*

【Invited】 10:20 – 10:45

Improvement on Conversion Efficiency of CIGS Thin Film Solar Cell Using Electrodeposition

Wen-Hsi Lee, T. W. Chang, Y. H. Su

Department of Electrical Engineering, National Cheng Kung University, Tainan 70155, Taiwan (R.O.C.)

Session: **Carbon-6**
Time: 11:25 – 12:30
Venue: Room B
Chair: Gehan A. J. Amaratunga

【Invited】 11:25 – 11:50

Interface engineering for efficient solar energy harvesting using earth abundant materials

Gautam Kumar Dalapati

*Institute of Materials Research and EngineeringA*STAR (Agency for Science, Technology and Research), Singapore*

【Invited】 11:50 – 12:15

Formation of nano-scale species by unstable particle beam ion implantation and their characterization by Mössbauer spectroscopy

Kenya Kubo[1], Yoshio Kobayashi[2,3], Yasuhiro Yamada[4], Takashi Nagatomo[1,2,5], Mototsugu Miharae[6], Jun Miyazaki[7], Wataru Sato[8], Shinji Sato[9], Atsushi Kitagawa[9]

[1] *International Christian University, Japan,*
[2] *University of Electro-Communications, Japan,*
[3] *RIKEN, Japan,*
[4] *Science University of Tokyo, Japan,*
[5] *KEK, Japan,*
[6] *Osaka University, Japan,*
[7] *Nihon University, Japan,*
[8] *Kanazawa University, Japan,*
[9] *National Institute of Radiological Sciences, Japan*

12:15 – 12:30

Study of electrical properties and device applications of IGZO thin films

Tupei Chen, Pan Liu

School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore

Session: **Memory-2**
Time: 9:10 – 11:05
Venue: Room C
Chair: Junji Tominaga

【Invited】 9:10 – 9:35

A proposal for the concept of pore-engineering as a method for controlling memory characteristics of resistive switching memories

Kentaro Kinoshita[1,2]

[1] *Department of Information and Electronics, Graduate School of Engineering, Tottori University, Japan,*
[2] *Tottori University Electronic Display Research Center, Japan*

【Invited】 9:35 – 10:00

Evolution of conductive filaments in Cu/MoOx CBRAM observed by means of in-situ TEM

Masashi Arita, Yuuki Ohno, Masaki Kudo, Yasuo Takahashi

Graduate School of IST, Hokkaido University, Japan

【Invited】 10:00 – 10:25

Dielectric Engineering for 3D Poly-Si Charge-Trapping Flash Memory Devices

Kuei-Shu Chang-Liao, Zong-Hao Ye, Chun-Yuan Chen

National Tsing Hua University, Taiwan, R.O.C.

【Invited】 10:25 – 10:50

Low-power programmable-logic array using complementary atom switch

Toshitsugu Sakamoto

Low-power Electronics Association & Project (LEAP), Japan

【Invited】 10:50 – 11:05

Low operation voltage of transparent resistive random access memory (T-RRAM) based on ultrathin a-TiO_x films and its resistive switching characteristics

Yi-Jen Huang[1], I-Chung Shih[2], Shih-Chun Chao[3], Cheng-Yen Wen[3], Jr-Hau He[2], Si-Chen Lee[1]

[1] Graduate Institute of Electronics Engineering, National Taiwan University, Taiwan,
[2] Graduate Institute of Photonics and Optoelectronics, National Taiwan University, Taiwan,
[3] Department of Materials Science and Engineering, National Taiwan University, Taiwan

Session: **Memory-3**
Time: 11:25 – 12:30
Venue: Room C
Chair: Masato Koyama

【Invited】 11:25 – 11:50

Experimental Study of Charge Trapping Type FinFET Flash Memory

Yongxun Liu[1], Toshihide Nabatame[2], Takashi Matsukawa[1], Kazuhiko Endo[1], Sinichi O'uchi[1], Junichi Tsukada[1], Hiromi Yamauchi[1], Yuki Ishikawa[1], Wataru Mizubayashi[1], Yukinori Morita[1], Shinji Migita[1], Hiroyuki Ota[1], Toyohiro Chikyow[2], Meishoku Masahara[1]

[1] National Institute of Advanced Industrial Science Technology (AIST), Japan,
[2] National Institute for Materials Science (NIMS) , Japan

【Invited】 11:50 – 12:15

Carbon Nanotube Quantum Nano Memory with Ultra-Low Programing Bias

Kazuhiko Matsumoto

Osaka University, Japan

12:15 – 12:40

Synthesis of MoS_2 crystals and fabrication of a heterostrucure with Graphene

Sachin Shinde, Kalita Golap, Subash Sharma, Remi Papon, Riteshkumar Vishwakarma

Nagoya Institute of Technology (NIT), Japan

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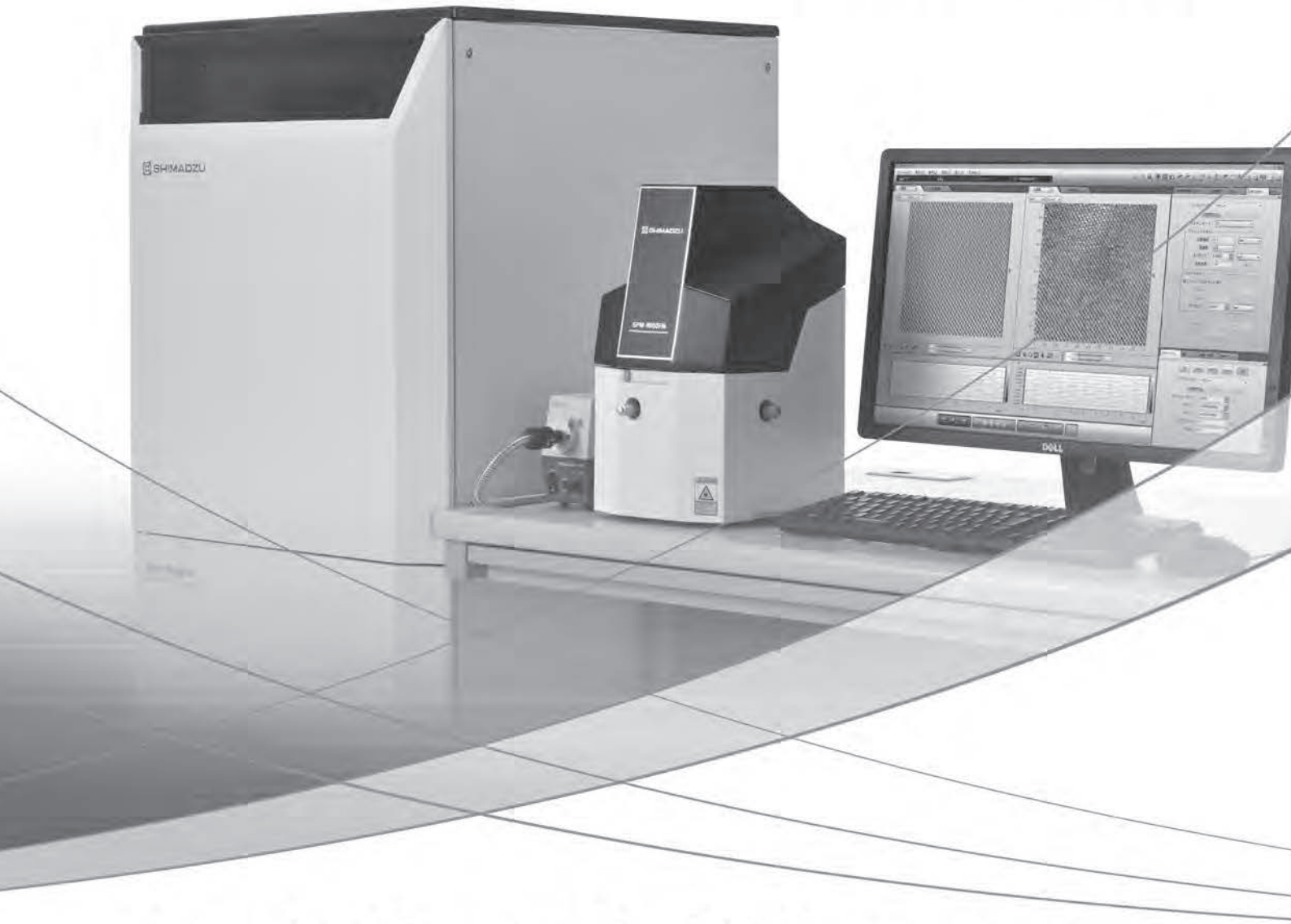

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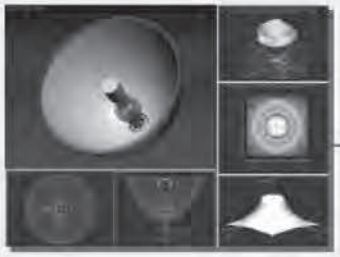

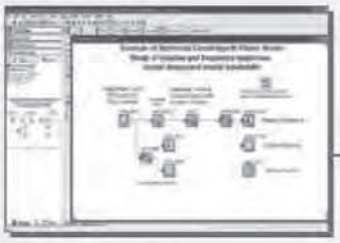

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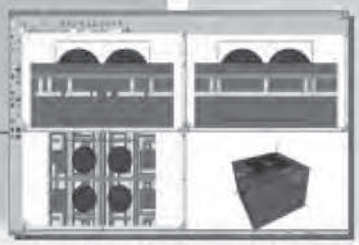

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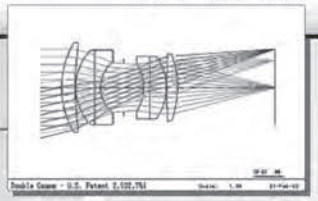

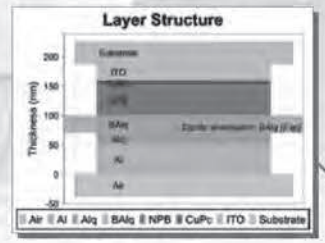

有機デバイス
シミュレータ
setfos
有機デバイスの
設計・解析に

光学分野エンジニアリングサービス

お客様の要望仕様にあわせた光学系の設計や
シミュレーションなどを承ります。

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測定する対象にあわせて各種オプションをご用意！

FPiS
Flat Panel Display Inspection System

目視では困難な高精細ディスプレイを
検査員の個人差に影響されない定量
的な評価が可能。

www.cybernet.co.jp/optical/

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オプティカル事業部

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KYOCERA THINKING ENERGY

エネルギーの歴史を、変えました。

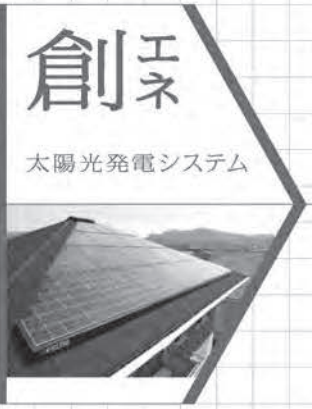
～決め手は、世界No.1の耐久性能～

日本最大級[※1]のメガソーラーが
桜島を臨む、鹿児島県七ツ島に誕生しました。
再生可能エネルギーの歴史を塗り変える
メガソーラーに採用されたのは、京セラの太陽電池。
長年の実績と世界No.1[※2]の耐久性能が
決め手となりました。

1982年、京セラは世界に先駆けて、
今主流の多結晶シリコン太陽電池の量産化に成功。
磨き続けたその品質は、
環境先進国ドイツの厳しい品質テストにおいて、
世界で初めて認証[※3]を獲得。
「世界最高水準の耐久性能」と立証されました。

何十年もの間、安定して発電し続けることが求められる太陽電池。
私たちは、長期信頼性という「品質」で応えたい。
そして、「創」「蓄」「省」すべてのエネルギー製品の
あるべきカタチを常に考え、提供し続けます。

ゆうき みお
優希美青



※1 2013年11月4日現在（京セラ調べ）
※2 フラウンホーファー研究機構が、世界の主要13製品に対して実施した耐PID試験による。
※3 太陽電池として世界ではじめて、テュフ ラインランドの長期連続試験認証を取得。

京セラ株式会社