6th IEEE International Nanoelectronics Conference
IEEE – INEC 2014

July 28th – 31st
Conference Hall, Hokkaido University, Sapporo, Hokkaido,
Japan

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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
Instrument and Research 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
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 BioFEFs 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, Yujang Lu, Jessica Koehne and Michael Cye.

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 Devices Society (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 Medal (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-EDS (Educational Activities Board) Meritorious Achievement Award in Continuing Education.
Recent technology of the lithium ion battery

Akira Yoshino
General Manager, Yoshino Laboratory, Asahi Kasei Corp.
2-1, Samejima, Fujii, 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 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
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 ultralow power magnetic devices.

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

References

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 Bailargeat


**Carbon nanotubes based nanopackaging dedicated to innovative high frequency interconnections**
Dominique Bailargeat

1 CNIRI, CNRS/INSU/THALES, UMI 3288, Research Techno Plaza, 50 Nanyang Drive, Border X, Block 6, Singapore 637553, SINGAPORE,
2 School of Electrical and Electronic Engineering, Nanyang Technological University, Block 51, 50 Nanyang Avenue, Singapore 639798, SINGAPORE.
3 XUM UMR 7252, Université de Limoges/CNRS, 123 Avenue Alberi 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. Silva¹, K.D.G.J. Jayawardena¹, J.S. Chen¹, Muhammad Ahmad¹, J.V. Anguita¹, G.D.M.R. Dabera¹, A.R. Cortess¹, J.D. Carey¹, V. Stolojan¹, M. Cole², W.I. Milne²
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 Emre Ayhan, Sachin Shinde, Remi Papon, Ritesh Kumar 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, Dongdaemun-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 |
| Venue: | Room B |
| Chair: | Wang Jae Chun & Kenji Hara |


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 TiO2(110) single crystal surface premodified with functional organic molecules

Satoru Takakusagi1, Hirofumi Nojima1, Hiroko Ariga1, Hiromitsu Uehara1, Kotaro Miyazaki1, Wang-Jae Chun2, Yasuhiro Iwasawa3, Kiyotaka Asakura1
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 CO2 Reduction

Takuya Masuda1,2, Kohei Uosaki1,3
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
[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 Peper1, Takeo Watanabe2, Teijiro Itohawa3, Nobuyuki Matsui1
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
IBR, Osaka University, Japan

18:05 – 18:20

Implementation of an Ultra-Low Voltage Robust Low-Power Static Domino Inverter
Halfdan Bechmann, Yingvar Berg
University of Oslo, Norway


Frequency Conversion in Quantum-Dot Photonic-Crystal Nanocavity Laser
Satoshi Iwamoto1,2, Yasutomo Ota2, Yasuhiro Arakawa1,2
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 Liaw¹,²
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 Kim¹, Kyung Min Byun¹, Tae Woo Kim², Jung Woo Leem², Jae Su Yu³
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

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[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
Nagoya 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 Tsaol¹, Li-Chiang Yeh¹, Yu-Che Cheng²
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 nanotubes-nickel composite beams for MEMS application

Zhonglie An¹,², Masaya Toda¹, Go Yamamoto³, Toshiyuki Hashida¹, Takahito Ono¹

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\textsuperscript{1,2}
\textsuperscript{1} The Hong Kong Polytechnic University Sheraton Research Institute, Sheraton 518057, China,
\textsuperscript{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 Yu1, Ming-Chin Li2, Yi-Chun Lai1, Pei-Ting Tsai1, Wei-Shuo Tseng1, Chih-I Wu1, Jui-Chung Hsiao1, Chen-Hsun Du1, Sheng-Fu Hsieh2, Hsin-Fei Meng3
1 Department of Photonics and Institute of Electro-Optical Engineering, National Chiao-Tung University, Hsinchu 30010, Taiwan,
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.

[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 Using Bio-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 Horino
IMRRI, Tohoku University, Japan

[Invited] 16:40 – 17:05

In Situ Analysis of Electrode Reactions in Solid Oxide Fuel Cells
Koji Amezawa1, Yashinobu Fujimaki2, Kiyoharu Nitta2, Yasuko Terada2, Takashi Nakamura2, Fumitada Iwai3, Hiroo Yagami3, Keiji Yashiro3, Tatsuya Kawada3
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. Liu$^{1,2}$  
$^{1}$ 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 Fujisawa, Katsuhiko Nishiguchi, Gent’o 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$^{1}$  
$^{1}$ Nanyang Technological University, Singapore,  
$^{2}$ MISTRAL-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 nanoscale 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 Mirzotaheri, 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

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<td>Time</td>
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[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-TeO2/n-SnO2 Hierarchical Heterostructures
Yung-Chiun Hsu, Ping-Fu Huang
National Chung Hsing University, Taiwan

16:30 – 16:45
Growth and photoluminescence enhancement of core shell ZrO2-ZnO nanowire arrays
Yuan Zhang1, Hong-Liang Lu1, Tao Wang1, De-Hui Lü1, Shi-Jin Ding1, David Wei Zhang1
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 ZnO composite Nanowires: Photoluminescence and Photoresponse Studies
Soumen Dhara1, Kenji Imakita1, Minoru Mizuhata2, Minoru Fujii1
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. Koops1, Hitoshi Fukuda2
1 HAWTo GmbH, Germany.
2 Hitachi High-Technologies Corporation, Japan
[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\textsuperscript{1}, Makoto Kuwata-Gonokami\textsuperscript{1,2,3}
\textsuperscript{1}Photon Science Center, The University of Tokyo, Japan,
\textsuperscript{2}Department of Physics, The University of Tokyo, Japan,
\textsuperscript{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

[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-Tsong Huang
National Chiao Tung University, Taiwan
[Invited] 12:15 – 12:40
Computational Materials Design (CMD®): Realization of the Switching Mechanism in RRAM
Hideaki Kasai1,2, Susan Aspera1, Yukio Tannai3, Nobuyoshi Awaya3
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 & Hiroshi 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
Hiramu Ishii1, Makoto Ishida1, Kazuaki Sawada1,2, Katsuyuki Machida1,3, Kazuya Masu4, Ken-Ichiro Ida1, Mitsumasa Saito5, Shinichi Yoshida6
1 Toyohashi University of Technology, Japan,
2 Electronics-inspired Interdisciplinary Research Institute (ERIS), Toyohashi University of Technology, 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-Al2O3/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, Wei-Yin Zeng, Yuan-Hui Liao, Anirban Das, Chia-Ming Yang
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, Meyya Meyyappan
1 Pohang University of Science and Technology(POSTECH), 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
NAST, Japan.

10:50 – 11:05
Characteristics of Nitrogen-Containing Plasma Treatment on PEDOT:PSS Piezoresistive Pressure Sensors
Rajat Subhra Karmaker, Jer-Chyi Wang, Yu-Jen Lu, Hsiang-Yu Liu, Chia-Ming Yang,
Chao-Sung Lai, Wei-Lun Zou, Mu-Yi Hua, Ming-Yih Lee, Chiung-Yin Huang, Kuo-Chen Wei
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 Kiriya1, Masahiko Ishida1, Kenichi Uchida2,3, Hiroko Someya1, Yuma Iwasaki1, Kazuki Iharana1, Shigeru Kohmoto1, Eiji Saitoh2,4,5,6, Tomoo Murakami7  
1 NEC Corporation, Japan,  
2 IMR, Tohoku University, Japan,  
3 JST-PRESTO, Japan,  
4 WPI-AMR, 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 Takenashia  
Institute for Materials Research, Tohoku University, Japan  

12:40 – 12:55  
Spin pumping and rectification effect driven by ferromagnetic resonance in cavity  
Ryo Iguchi1, Eiji Saitoh1,2,3,4  
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, Switzerland  

[Invited] 15:50 – 16:15  
Highly sensitive HARP image sensor with Spindt-type field emitter array  
Yuki Honda1,2, Masakazu Nanba1, Kazunori Miyakawa1, Misao Kubo1, Noritumi Egami3  
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 Takeuchi1,3,4, Satoshi Koizumi1,2,3,4, Toshiharu Makino1,3,4, Hiromitsu Kato1,3,4,
Masahiko Ogura1,3,4, Hiromichi Ohashi1,3,4, Hideyo Okushi1,3,4, Satoshi Yamasaki1,3,4
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
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 Jeng1, Evgenia Rabenok2, Gennady Novikov2, Jian-Ping Ao3, Yun Sun3, Liann-Be Chang1, Wu-Shiung Feng1
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

WO3/TiO2 core-shell nanostructure for the enhancement of electrochromic, photodegradation, and self-cleaning performance
Bonn-Ran Huang, Tzu-Ching Lin, 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, Ryohi Sano, Hiroshi Magi, Yudai Fukushi, Yasushiro Nishioka
College of Science and Technology, Nihon University, Japan

Thermoelectric properties of Ca0.5Ce0.5-xLaxMnO3 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 TiO2/SiO2 Space Layer and Voltage Biasing
Min-Chun Huang, Wen-Jeng Ho, Yi-Yu Lee, Zhong-Fu Hou, Jian-Jyun Liao
National Taiwan University of Technology, Taiwan

Optimization of CdS buffer layer on the performance of Cu2ZnSnS4 solar cells
Ming-Yang Hsieh, Shou-Yi Kuo
Chang Gung University, Taiwan

A flexible glucose biofuel cell with porous polypyrrole electrodes modified with enzymes
Ryohi Sano, Tsubasa Sasaki, Shohei Koide, Hiroshi Magi, Yudai Fukushi, Yasushiro Nishioka
College of Science and Technology, Nihon University, Japan

The Cu concentration effect on the electro-optical properties of Cu2ZnSnS4 thin films prepared by thermal evaporation with post selenization
Yu-Ling Wei1, Jui-Fu Yang2, Shou-Yi Kuo1
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 Rahman1,4, Takeru Oikado1, Noritaka Usami2, Seiji Samukawa1,3,4
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 CuInS2 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 FesOx nanoparticles for high performance anode material Lithium-ion batteries
De Pham-Cong1, Jung Soo Park2, Ji Yoon Kim3, Jae Hyun Kim4, Chae-Ryong Cho5
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 and 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 Kumar1, Anjana Bagga2, Neelshewar Sonnath3
1 Indian Institute of Technology Delhi, New Delhi, India.
2 GGSI Indraprastha University, Delhi, India.

Highly transparent and flexible field emission display based on hybridized nanocarbon
Masaki Tanemura1, Debashish Ghosh, Mohd Zamri Yusop2, Zurita Zulkifli2, Pradip Ghosh, Golap Kanti3
1 Nagoya Institute of Technology, Japan
2 Department of Frontier Materials, Nagoya Institute of Technology, Gokiso cho, Showa-ku, 466-8555 Nagoya, Japan

Synthesis of carbon nanoflakes on stainless steel substrates by RF sputtering for electron field emission application
Wen-Ching Shih, Hsuang-Chen Chang
Taiung University, Taiwan

Direct Observation of Bi-layer Graphene Field Emission Properties by In Situ TEM
Mohd Zamri Mohd Yusop1,2, Golap Kalita2, Yazid Yaakob2, Saufi Rosmi2, Masak Tanemura2
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 Halubail, Toan Nguyen Van, Tomohiro Kubota, Takahito Ono, Seiji Samukawa
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 Belbassir, Zhongjie 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, Wei-Yin Zeng, Yuan-Hui Liao, Anirban Das, Chia-Ming Yang, Chao-Sung Lai
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
Electroactive Polymer Actuated Tendon Driven Micro Actuator for Robotic Application
Md Masum Billah, Raisuddin Khan, Amir Akrain Shafie, Rini Akremiawati
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, Chia-Ping Hsien, Ming-Han Liao, Sen-Wen Cheng, Yu-Huan Guo
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
Jungsi Kim, Junyoung Lee, Jiyeongwan Oh, Taluk Rim, Chang-Ki Baek, Meyya Meyyappan, Jeong-Soo Lee
1 Division of IT Convergence Engineering, Pohang University of Science and Technology, Republic of Korea,
2 Department of Electrical Engineering, Pohang University of Science and Technology, Republic of Korea,
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
Chien-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, Mansun Chan
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
Shinriko Shin, Akio Higo, Kenichi Yoshikawa, Yosuke Tamura, Takayuki Kiba, Akihiro Murayama, Yiming Li, Seiji Samukawa
1 IPS, Tohoku University, Japan,
2 WPI-AIMR, Tohoku University, Japan,
3 JST-CREST, Tohoku University, Japan,
4 Graduate School of Information Science and Technology, Hokkaido University, Japan,
5 Department of Electronic Engineering, Tohoku University, Japan.
The disordered cation distribution studies of nanosized zinc ferrite powders by synchrotron X-ray absorption spectroscopy
Thanit Tangcharoen1,2, Wantana Klysobun3, Chanapa Kongmark3, Wisanu Pecharapa1,3
1 College of Nanotechnology, King Mongkut’s Institute of Technology Ladkrabang (KML), Bangkok, 10520, Thailand,
2 Synchrotron Light Research Institute (SRL), Nakhon Ratchasima, 30000, Thailand,
3 Thailand and Center of Excellence in Physics (ThEP Center), CHE, 32B Sityuthaya Rd., Bangkok, 10400, Thailand

Numerical study on generation process of neutral beam by collision of ions against graphite surface
Tomohiro Kubota1,2, Naoki Watanabe3, Shingo Ohtsuka3, Takuya Iwasaki3, Kohei Ono3, Yasuhiro Iriy4, Seiji Samukawa2,4
1 Institute of Fluid Science, Tohoku University, Japan,
2 3D BEANS Center, BEANS Project, Japan,
3 Mihoro 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 Islam1, Md. Nur Kutubul Alam2, Md. Rafiquil Islam3
1 Dept. of EEE, Khulna University of Engineering & Technology (KUET), Bangladesh,
2 Dept. of EEE, Khulna University of Engineering & Technology (KUET), Bangladesh,
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 Islam1, Md. Nur Kutubul Alam2, Md. Rafiquil Islam3
1 Department of Electrical and Electronic Engineering, Khulna University of Engineering & Technology (KUET), Bangladesh,
2 Department of Electrical and Electronic Engineering, Khulna University of Engineering & Technology (KUET), Bangladesh,
3 Department of Electrical and Electronic Engineering, Khulna University of Engineering & Technology (KUET), Bangladesh

Ballistic performance comparison of III-V XO1 and Junction-less XO1 nFETs
Md. Nur Kutubul Alam1, Muhammad Shaffatul Islam2, Md. Rafiquil Islam3
1 Department of Electrical and Electronic Engineering, Khulna University of Engineering & Technology (KUET), Bangladesh,
2 Department of Electrical and Electronic Engineering, Khulna University of Engineering & Technology (KUET), Bangladesh,
3 Department of Electrical and Electronic Engineering, Khulna University of Engineering & Technology (KUET), Bangladesh

Highly functionality of three-terminals nanodot array
Isamu Yoshioka1, Hikaru Satoh1, UchidaTakahumi2, Akira Fujiwara2, Masashi Arita1, Yasuo Takahashi1
1 Information Science & Technology, Hokkaido University, Japan,
2 NTT Basic Research Laboratories, Japan

The research of Excited states in Si-SET
Hikaru Satoh1, Takafumi Uchida1, Isamu Yoshioka1, Akira Fujiwara2, Masashi Arita1, Yasuo Takahashi1
1 Information Science & Technology, Hokkaido University, Japan,
2 NTT Basic Research Laboratories, Japan

Double-quantum-dot Si single-electron transistor with multiple gates
Takafumi Uchida1, Isamu Yoshioka1, Hikaru Satoh1, Masashi Arita1, Akira Fujiwara2, Yasuo Takahashi1
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 Liao1, Chien-Wei Chiu2, Chieh-Hsiung Kuan1, Tsung-Yi Huang2, Tsung-Yu Yang2
1 National Taiwan University, Taiwan,
2 RIEtek Technology Corporation, Taiwan
Electronic transition in ultra-thin BiSrzCo3O8 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 Dhar1, Kenji Imakita1, P. K. Giri2, Minoru Fujii3
1 Department of Electrical and Electronic Engineering, Graduate School of Engineering, Kobe University, Japan,
2 Department of Physics, Indian Institute of Technology Guwahati, India

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 Kiba1, Xiaojie Yang, Junichi Takayama, Agus Subagyo, Kazuhiro Sueoka, Akihiro Murayama
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, Kazuhiro 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
Tori Tanaka1, Takayuki Kiba1, Yosuke Tamura1, Cedric Thomas2,4, Akio Higo5, Seiji Samukawa5,6,4, Akihiro Murayama1,4
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, Kazuhiro 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 Kiba1,4, Akio Higo5, Yosuke Tamura1, Cedric Thomas2,4, Seiji Samukawa5,6,4, Akihiro Murayama1,4
1 Hokkaido University, Japan,
2 WPI-AIMR, Tohoku University, Japan,
3 JST-CRT, Tohoku University, Japan,
4 CREST Japan Science and Technology Agency, 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 Ko1,2, Tien-Chang Lu2, Jung-Ron Chen2, Sin-Liang Ou3, Chia-Ming Chang2, Hau-Chung Kuo1, Der Yuh Lin
1 Department of Electronic Engineering, National Cheng Kung University, 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
Akihito Suzuki1, Atsuhiko Fukuyama1, Hidetoshi Suzuki1, Kentaro Sakai2, Ji-Hyun Paek3, Masahito Yamaguchi1, Tetsuo Ikari1
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 CuInSe2 Thin Films with Different Cu/In Ratio
Shou-Yi Kuo1, Fang-I Lai2, Pei-Jhe Liou1, Jui-Fu Yang1, Shiang-Yi Hu2
1 Department of Electronic Engineering, Chang Gung University, Taiwan.
2 Department of Photonics Engineering, Yuan Ze University, Taiwan.
Wednesday, 30 July 2014

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

[Invited] 9:10 – 9:35  
Low-temperature Microwave annealing Process for future IC fabrication  
Yao-Jen Lee1, Bo-An Tsai2, Ta-Chun Cho2, Fu-Kuo Hsueh1,2, Po-Jung Sung1,2, Chiung-Hui Lai2, Chih-Wei Luo3, Tien-Sheng Chao4  
1 National Nano Device Laboratories, Taiwan.  
2 Department of Electrophysics, National Chiao Tung University, Taiwan.  
3 Department of Electronics Engineering, Chung Hua University, Hunchu, Taiwan

[Invited] 9:35 – 10:00  
Vector soliton dynamics of graphene mode locked fiber lasers  
Dingyuan Tang1, Yufeng Song1, Luming Zhao2, Deyuan Shen2  
1 School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore.  
2 School of Physics and Electronic Engineering, Jangsu 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 Takahashi1, Hiroti Takenaka1, Akira Fujisawa2, Masashi Arita1  
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. Tobing1, Z.J. Xu1, Dawei Zhang2, K.S. Low1, D.H. Zhang1  
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 Fujisawa

[Invited] 11:25 – 11:50  
BEOL-Compatible Oxide-Based Transistor Technology  
Hong-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

AI/Ge Simultaneous Oxidation Process using Oxygen Neutral Beam for Ge MOS Transistor
Takeo Ohno1,2, Daiki Nakayama1, Seiji Samukawa3
1 WPI-AIMR, Tohoku University, Japan,
2 PRESTO, JST, Japan,
3 IPS, Tohoku University, Japan

12:30 – 12:45

Surface dependence of nonlinear electrical characteristics in GaAs-based three-branch nanowire junction devices
Masaki Sato1,2, Xiang Yin2, Ryota Kuroda1,2, Seiya Kasai1,2
1 Graduate School of Information Science and Technology, Hokkaido University, Japan,
2 Research Center for Integrated Quantum Electronics, Hokkaido University, Japan

[Invited] 15:25 – 15:50

Application of Graphene to Transistors and Interconnects for Future LSIs
Shintaro Sato1,2
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 Han1,2, Kazuto Akagi1, Filippo Federici Canova1, Hirotaka Mutoh1, Susumu Shiraki1, Katsuya Iwaya1, Paul S. Weiss1,2, Naoki Asao1, Taro Hifosugi1
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 MoS2 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 Silva

[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
Yancai Cao¹, Nguyen Viet Long¹, Masaki Tanemura², Masayuki Nogami³
¹ Shanghai Institute of Ceramics, Chinese Academy of Sciences, China.
² Nagoya Institute of Technology, Japan.
³ Toyota Physical and Chemical Research Institute, Japan

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 Cho¹, Akihito Murayama², Kwangseuk Kyhm³
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 – 09:35
Random Dopant Fluctuation in Gate-All-Around Nanowire FET
Cher Ming Tan¹, Xiangchen Chen²
¹ Chang Gung University, Taiwan.
² Nanyang Technological University, Singapore

[Invited] 09:35 – 10:00
Graphene bandgap engineering by CF₃ plasma doping and its applications
Chao Sung Lai¹, Kuan IHo¹, Ching-Yuan Su²
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 Fujii1, 2, Takeru Okaaa2, Mord Erman Syazwan2, Taiga Isoda1, Hirotaka Endo1, Mohammad Maksudur Rahman1, 3, Konei Ito1, Seiji Samukawa2
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

Session: Photo-3
Time: 11:25 – 12:55
Venue: Room 8
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
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
Kwangseok 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 Lin1, Ming-Lun Lee1, Chieh-Hsiung Kuan1
1 Department of Biomedical Engineering, Hsing Kung University, Taichung City 43302, Taiwan
2 Graduate Institute of Electronics Engineering, National Taiwan University, Taipei City 10617, Taiwan
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

Topological Switching Nonvolatile Memory (TRAM) using [(GeTe)_{x}(SbTe)_{y}] in Phase Change Superlattice Structures
Junji Tominaga
National Institute of Advanced Industrial Science & Technology (AIST), Japan

Process and device technologies of topological-switching random-access memory (TRAM)
Norikatsu Takaura
Low-power Electronics Association & Project (LEAP), Japan

Effects of Plasma Treatment on Gadolinium Oxide Resistive Switching Memory
Jer-Chyi Wang1, Yu-Ren Ye1, Chih-Hsiien Hsu1, Ying-Huei Wu1, Chi-Fong A2, Wen-Fa Tsai2
1 Department of Electronic Engineering, Chang Gung University, Taiwan.
2 Institute of Nuclear Energy Research, Atomic Energy Council, Taiwan

Density functional study on the structures of conductive filaments and ion migration behaviors in tantalum-oxide-based resistive switching devices
Satoshi Watanabe, Bo Xiao
Department of Materials Engineering, The University of Tokyo, Japan

Advanced Hydride Research for Hydrogen and Electrochemical Energy Storage
Shin-ichi Orito
WPI Advanced Institute for Materials Research (WPI-AIMR) / Institute for Materials Research, Tohoku University, Japan

Large Scale Molecular Dynamics Simulations for Transport Phenomena of Materials in Polymer Electrolyte Fuel Cell
Takashi Tokunari
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 Toyoura1, Atsutomo Nakamura1, Katsuyuki Matsunaga1,2
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 Mori1,4, Gennady Mil’nikov1,4, Yoshinari Kamakura1,4, Tomofumi Zushi2, Takanobu Watanabe2, Masashi Uematsu2, 4, Kohel Mitsui3,4
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 Shiraiishi
Kanagawa Institute of Technology, Japan

[Invited] 10:25 – 10:50
Theoretical studies of graphene on SiC
Hiroaki Kageshima1,2, Hiroki Hibino2, Hiroshi Yamaguchi2, Masao Nagase3
1 Shimane University, Japan, 2 NTT Basic Research Laboratories, Japan, 3 University of Takushoku, 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
Zihan Ali Syed Mohammed, Xinlong Zhu, Poenar Daniel Puiu, Sheel Aditya
School of EEE, Nanyang Technological University, Singapore
**Simulation of Filamentary Switching in Binary Metal Oxide Based RRAM devices**
Blanka Magyari-Kopeč, Liang Zhao, Katsumasa Kamiya, Moon Young Yang, Kenji Shiraishi, Yoshihisa Nishii
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

**Theory of high efficiency photoelectric conversion in carbon nanotubes**
Satoru Konabe
University of Tsukuba, Japan

**Ab initio Molecular Dynamics of Nanobiomolecules**
Katsumasa Kamiya
Kanagawa Institute of Technology, Japan

**Impact of Image Force Effect on Gate-All-Around Schottky Barrier Tunnel FET**
Shuichiro Hashimoto, Hiroki Kosugiyama, Kohei Takei, Sung Jing, Yuji Kawamura, Yasuhiro Shikahama, Kenji Ohmori, Takanobu Watanabe
1 Faculty of Science and Engineering, Waseda University, Japan
2 Graduate School of Pure and Applied Sciences, University of Tsukuba, Japan

**Bio-magnetic field sensor application of magnetic tunnel junctions**
Yasuo Ando, Takuo Nishikawa, Kousuke Fujiiwa, Daiki Kato, Mikihiko Ogane, Hiroshi Nagano
1 Department of Applied Physics, Graduate School of Engineering, Tohoku University, Japan
2 Corporate R&D Headquarters, KONICA MINOLTA, INC., Japan

**Magnetic domain wall motion and spin-orbit torque induced magnetization switching for three-terminal spintronics devices**
Shunsuke Fukami, Chaoliang Zhang, Hideo Ohno
1,2,3,4 Tohoku University, Japan
2 CSIT, Tohoku University, Japan
3 Laboratory for Nanoelectronics and Spintronics, RIEC, Tohoku University, Japan
4 WPI-AMR, Tohoku University, Japan
[Invited] 16:15 – 16:40

Novel approach to investigate spin-polarization in half-metallic Heusler compounds via anisotropic magnetoresistance effect
Yuya Sakuraba1, Satoshi Kokado2, Yusuke Hirayama1, Takao Furubayashi1, Hiroaki Sukegawa1, Songtian Li1, Yukiko Takahashi1, Kazuhiro Hono1
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, Hirosi 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 Nanolimprint Lithography
Mitsunobu Okuda1,2, Yasuyoshi Miyamoto1, Eichi Miyashita1, Nobuo Saito1, Naoto Hayashi1, Shigeki Nakagawa2
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 Janssen
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, Tadasmi Daibou, Yushi Kato, Chikayoshi Kamata, Yuichi Oosawa, Hiroki Noguchi, Hiroki Yoda
Toshiba Corp., Japan

[Invited] 18:30 – 18:55

Spin injection, detection and local magnetoresistance through Si at room temperature in ferromagnet/MgO/ SOI lateral spin valves
Yoshiaki Saito1, Misue Ishikawa1, Hideyuki Sugiyama1, Tomoaki Inokuchi1, Tetsufumi Tamamoto1, Nobuki Tezuka2, Kone Hamaya3
1 Toshiba Corporation, Japan,
2 Tohoku University, Japan,
3 Osaka University, Japan


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
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 Nakane1, Takahiro Hiroi1, Masaki Kudo1, Masashi Arita2, Hideyuki Ando1, Takashi Morie2, Yasuo Takahashi2
1 IST, Hokkaido Univ., Japan.
2 Kyushu Inst Technol, Japan

Study on In-situ TEM observation of WOx ReRAMs with Cu top electrodes
Akihito Takanashi, Yuuki Ohno, Masaki Kudo, Akitoshi Nakane, Masashi Arita, Yasuo Takahashi
Information Science & Technology, Hokkaido University, Japan

Switching characteristics of Cu-MoOx ReRAM
Takahiro Hiroi1, Akitoshi Nakane1, Takashi Fujimoto1, Masashi Arita1, Hideyuki Ando2, Takashi Morie2, Yasuo Takahashi1
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 Chen1, Chih Kai Chen2, Shu-Fen Hu3, Ru Shih4
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 LuNiIICo/Au interface
Naoto Ogawa1, Kenta Kimotot1, Syogo Hatakë1, Masamichi Sakainot1, Tsuyoshi Takasnet1, Yong Sun2
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 Juan1, Ming-Yang Shih1, Chen-Ting Yeh2, Chia-Ming Yang2, Mu-Yi Hua2, Chao-Sung Lai1
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

Ambipolarity and electrical properties of thermally treated ultrathin carbon membranes grown by focused ion beam induced deposition of phenanthrene
Gemma Rius1, Marc Sansa2, Xavier Borris3, Francesc Perez-Murano3, Masamichi Yoshimura3, Narcís Mestres4
1 Nagoya Institute of Technology, Japan.
2 Institu de Microelectronica de Barcelona, Spain.
3 Toyota Technological Institute, Japan.
4 Institute de Ciencia de Materiais, Spain
Coherent Electronic Transport in Edge-Disordered Graphene Nanoribbons
Kengo Takashima1, Hiromu Fujii1, Takahiro Yamamoto1,2
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 PFe Nanoparticles on PDDA-modified-Graphene
Ting-Yu Liu1, Li-Ying Huang2, Tzu-Yi Chao1, Tung-Yuan Yung3,4,5, Ling-Kang Liu6
1 Department of Materials Engineering, Ming Chi University of Technology, New Taipei City 24351, 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, Nankang, Taipei 115, Taiwan, Taiwan.

Conductive DLC deposition by NBECVD for application of Bio-LSI
Xijiang Chang1, Yoshiyuki Kikuchi1,2, Tomohiro Kubota1, Kumi Y. Inoue1, Tomokazu Matsue3,4,5, Seiji Samukawa1,5
1 Institute of Fluid Science, Tohoku Univ., Japan.
2 Tokyo Electron Limited, Japan.
3 Graduate School of Environmental Studies, Tohoku Univ., Japan.
4 ISEC, Tohoku Univ., Japan.
5 WPI-AMIR, Tohoku Univ., Japan

Neutral beam induced nitridation of multi-layer graphene
Takeru Okada1, Seiji Samukawa1,2
1 Institute of Fluid Science, Tohoku University, Japan.
2 WPI-AMIR, Tohoku University, Japan

First-principles study on formation of atomically precise graphene nanoribbons
Tomoaki Kaneko1,2, Nobuo Taji1,2, Takahisa Ohno1,2,3
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-HfO2(111): first-principles analysis
Tomoaki Kaneko1,2, Takahisa Ohno1,2,3
1 National Institute for Materials Science, Japan.
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-Taher Chenitr1, Takeru Okada1, Naoyuki Kawai1, Kazumi Wada1, Seiji Samukawa1,3,4
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 Kalia, Subash Sharma, Sachin Shinde, Masaki Tanemura
Nagoya Institute of Technology, Japan

Graphene dots fabrication by a bio-template and a neutral beam etching
Koki Igarashi1, Takeru Okada1, Patrick Han2, Katsuaki Sugawara2, Taro Hitosugi2, Seiji Samukawa1,2
1 Institute of Fluid Science, Tohoku University, Japan.
2 WPI-AMIR, Tohoku University, Japan
Evaluation of potential variation around grain boundaries in BaSi2 on poly-crystalline Si substrates
Masakazu Baba1, Weijie Du1, Ryota Takabe1, Kaoru Tako1, Kentaro Watanabe1, Takashi Sekiguchi2, Kosuke O. Haru3, Noritaka Usami3,4, Takashi Suemasu1,4
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 doped ZnO nanowires
Tsung-Shine Ko1, Sin-Liang Ou2, Kuo-Sheng Kao3, Der Yuh Lin1
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, BHU-TE University, Taiwan

Tailoring the physical properties of (Ba, Ca)(Ti, Zr)O3 - SmO3 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 Konishi1, Takao Miyamoto1, Zhixin Cui1, Tomotsugu Ishikura1, Kanji Yoh1, Akihiro Hashimoto2
1 RCQE Hokkaido University, Japan
2 Fukushima University, Japan

Growth and characterization of transport properties of <110>-oriented InAs nanowires
Zhixin Cui, RAJA GEMLPERUMAL, Tomotsugu Ishikura, Keita Konishi, Kanji Yoh, Junichi Motohisa
RCQE, Hokkaido University, Japan

Physical properties of Ti-doped ITO Nanoparticles Synthesized by Co-precipitation Method
Krishna Chongsri1, Jiunthanin Kanoksinwuttipong2, Wihan Techitdheera2, Wisanu Pecharapa3,4
1 Department of Applied Physics, Faculty of Science and Technology, Rajabhat Rajanagarindra University, Bangkok, 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, Thailand

Photocatalytic activity and dye-sensitized solar cell performance of Cu-doped ZnO nanopowders
Kankanit Phiwadang1, Krishna Chongsri2, Wanichaya Mekprasart1, Wisanu Pecharapa1,3
1 College of Nanotechnology, King Mongkut’s Institute of Technology Ladkrabang, Thailand,
2 School of Applied Physics, Faculty of Science and Technology, Rajabhat Rajanagarindra University, Bangkok, Thailand,
3 ThEP Center, Thailand

Structural transformation of Si-incorporated carbon nanofiber studied by in situ TEM
Yazid Yaakob1,2, Mohd. Zaini Mohd. Yusop1,2,3, Yu Kuwata4,5, Chisato Takahashi2, Golap Kalita1, Masaki Tanemura1
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 (R.O.C.)
In Site Transmission Electron Microscopy Observation of Structural Changes in Cu-deposited Carbon Nanofiber At High Current Flow
Mohamad Saufi Rosmi1,2, Yazid Yaakob1,2, Mohd Zamri Mohd Yusop1,4, Golap Kalita1, Masaki Tanemura1
1 Department of Frontier Materials, Nagoya Institute of Technology, Gokisocho, Showa-Ku, Nagoya 466-8555, Japan.
2 Department of Chemistry, Faculty of Science and Mathematics, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia.
3 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 Lui, Yi-Jen Huang1, Jui-Ju Hsia2, Hung-Ing Chen2, Jen-Cheng Wang1, Chia-Hui Fang2, Ya-Fen Wu1, Tzer-En Nee2
1 Tunghsien University, Taiwan, Republic of China.
2 Chang Gung University, Taoyuan, 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 Lui1, Shin-Huang Tsai1, Hung-Ing Chen2, Chia-Hui Fang2, Jui-Ju Hsia2, Yi-Jen Huang2, Jen-Cheng Wang2, Tzer-En Nee2
1 Tunghsien University, Taiwan, Republic of China.
2 Chang Gung University, Taoyuan, Republic of China.

Cux-xSe nanoparticles for thermoelectric application
Rajesh Kumar1, B Khasimsaheb1, B Shivaiah2, Ajay Dhar2, Sonnath Neeleshwar1
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/Aluminium
Jung Ju Lee1, Won Seok Kim2, Kum Cheol Shin2, Ju Won Jeong1, Sang Young Kim1
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 TiOx Passivation layer Based on Optimal Light Trapping and Surface Recombination Reducing
Po-Hung Tsai1, Wen-Jung Ho1, Chia-Min Chang1, Hung-Chang Hus2, Ching-Fuh Lin2
1 National Taipei University of Technology, Taiwan.
2 National Taiwan University, Taiwan.

Prediction of plasma etching profile using on-wafer monitoring system
Tomohiro Kubota1, Michio Sato2, Takuya Iwasaki3, Kohei Ono3, Seiji Samukawa1,4
1 Institute of Fluid Science, Tohoku University, Japan.
2 Harada Corporation, Japan.
3 Mie University, Japan.
4 WPI-AMR, Tohoku University, Japan.

GaAs/AIGaAs quantum nanodisks by using neutral beam etching and their optical response
Yosuke Tamura1, Akio Higo2, Takayuki Kibo2, Cedric Thomas1,4, Takeru Okada1, Wang Yunneng1, Hassanet Sodabanlou1, Masakazu Sugiyama2, Yoshiaki Nakano3, Akihiro Murayama3,6, Seiji Samukawa1,2,6
1 Institute of Fluid Science, Tohoku University, Japan.
2 WPI-Advanced Institute for Material Research, Tohoku University, Japan.
3 Graduate School of Information, Science and Technology, Hokkaido University, Japan.
4 KCASIT, The University of Tokyo, Japan.
5 School of Engineering, The University of Tokyo, Japan.
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 Higa¹, Takayuki Kiba², Yosuke Tamura³, Shintaro Ishii⁴, Cedric Thomas⁵, Takuya Ozaki⁶,
Akihiro Murayama⁷, Seiji Samukawa¹, ², ³
¹ WPI-AMR, Tohoku University, Japan,
² Hokkaido University, Japan,
³ JSPS, Tohoku University, Japan,
⁴ JST-CREST, Japan

Low Temperature InGaAs Oxidation Process using Defect-Free Neutral Beam Technology with Various Indium Concentrations
Chang Yong Lee¹, ², Akio Higo³, Cédric Thomas¹, ³, Yosuke Tamura¹, ³, Seiji Samukawa¹, 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
Cédric Thomas¹, ², Yosuke Tamura¹, ², Takeru Okada¹, Akio Higo³, Seiji Samukawa¹, ², ³
¹ Tohoku University, Japan,
² CREST Japan Science and Technology Agency, Japan,
³ WPI-AMR Tohoku University, Japan

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 Chen¹, Pei-Jia Wu², Kuan-Yuan Shen¹, Chieh-Hsiung Kuan¹, 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 Yoshikawa¹, Akio Higo², Chang Yang Lee¹, Yosuke Tamura¹, ², ³, Cedric Thomas¹, ², ³,
Takayuki Kiba², ³, Shintaro Ishii³, Hassanet Sodabanlu³, Yunpeng Wang³, Masakazu Sugiyama⁴,
Yoshitake Nakano³, Ichiro Yamashita³, Akihiro Murayama³, Seiji Samukawa¹, ², ³
¹ Institute of Fluid Science, Tohoku University, JAPAN,
² WPI-Advanced Institute for Materials Research, Tohoku University, JAPAN,
³ Graduate School of Information Science and Technology, Hokkaido University, JAPAN,
⁴ RCAST, The University of Tokyo, JAPAN,
⁵ Naro Institute of Science and Technology, JAPAN,
⁶ School of Engineering, The Univ. of Tokyo, JAPAN,
⁷ CREST Japan Science and Technology Agency, JAPAN

In-situ observation of electromigration-induced atomic steps movement
Yosuke Murakami, Ryouta Tonesaka, Kouichi Hamada, Masashi Arita, Yasuo Takahashi
Graduate School of IE, Hokkaido University, Japan

Applying grounded hardware structures to suppress proximity effect and charging effect in e-beam lithography.
Shao-Wen Chang¹, Kuan-Yuan Shen¹, Chieh-Hsiung Kuan¹, 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 Shen¹, Shao-Wen Chang¹, Hsiu-Yun Yeh², Hung-Ming Chen¹, Chieh-Hsiung Kuan¹
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 Chang1, Yi-Ting Lin1, Chai-Ming Yang2, Ji-dang Luo3, Chiuan-Chian Chiou3, Chao-Sung Lai1
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 membrane for hydrogen and potassium ion detection
Hau-Cheng Wang1, Tsung-Cheng Chen1, Hao Yang1, Teng-Wei Juan1, Pi-Chun Juan2, Chia-Ming Yang3, Chao-Sung Lai1
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 Ozaki1, Takeru Okada1, Tomohiro Kubota1, Seiji Samukawa1,2
1 Institute of Fluid Science, Tohoku University, Japan,
2 WPI-AIMR, Tohoku University, Japan

Magnetoresistance and microstructure of Fe-MgF2 single layer granular films
Tokihiro YOKONO, Eito SATO, Yousuke MURAKAMI, Masashi ARITA, YasuoTAKAHASHI
RI HOKKAIDO UNIV., Japan

Enhanced spin injection from ferromagnet into InAs through MgO tunnel barrier
Tomotsugu Shiokura1, Zhixin Cui1, Keita Konishi1, Kanji Yoh1, Tetsuya Uemura2
1 RCIGE, 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 Technology (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
Soheili Farhana, AHM Zahirul Alam, Sharaz Khan
International Islamic University Malaysia, Malaysia

10:30 – 10:45
Boosting of ON current using spacer and charge plasma concept.
Ishu Agrawal1, P. N Kondekar2
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
InGaSb Junctionless DG-nMOSFET: A Quantum Transport study at Gate Length down to 5 nm and 7 nm
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 Saga

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. Tso-Yuan

[Invited] 9:40 – 10:05
Design, fabrication and characterization of thin film monocrystalline-silicon solar cells with efficient light trapping
Alain Fave1,2, Loïc Labouat1,2,3, Xianqin Meng4, Guillaume Gomard5, Christos Trompoukis6, Romain Champary1,2,3, Oussi El Dali4, Valérie Depauw4, Emmanuel Drouard1,3, Fabien Mondirotto1,3, Christian Seassal1,3
1 Université de Lyon, Institut des Nanotechnologies de Lyon (INL) UMR 5270 CNRS-INSA-ECLA-UCBL, France.
2 INSA de Lyon, Bat. Blaise Pascal, 7 Avenue Colonel, 69621 Villerbanne, France.
3 École Centrale de Lyon, 36 Avenue Guy de Collongue, 69134 Écully, France.
4 Imec, Kapeldreef 73, 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.Hara1,2, Norihaka Usami1,2, Masakazu Baba3, Kaoru Toko1, Takashi Suemasu2,3
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, Taiwan 70155, Taiwan (R.O.C.)
[invited] 11:25 – 11:50
Interface engineering for efficient solar energy harvesting using earth abundant materials
Gautam Kumar Dalapati
Institute of Materials Research and Engineering (IMRE) of A*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 Kubo1, Yoshihisa Kobayashi2,3, Yasuhiro Yamada4, Takashi Nagatomo1,2,5, Mototsugu Minarai6, Jun Miyazaki7, Wataru Sato8, Shinji Sato9, Atsushi Kifagawa9
1International Christian University, Japan,
2University of Electro-Communications, Japan,
3RIKEN, Japan,
4Science University of Tokyo, Japan,
5KEK, Japan,
6Osaka University, Japan,
7Nihon University, Japan,
8Kanazawa University, Japan,
9National 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

[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 Kinashita1,2
1 Department of Information and Electronics, Graduate School of Engineering, Tohoku University, Japan,
2 Tohoku 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 α-TiO2 films and its resistive switching characteristics
Yi-Jen Huang1, I-Chung Shih2, Shih-Chun Chao3, Cheng-Yen Wen4, Jr-Hau He5, Si-Chen Lee1
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

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<th>Session: Memory-3</th>
<th>Time: 11:25 – 12:30</th>
<th>Venue: Room C</th>
<th>Chair: Masato Koyama</th>
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[Invited] 11:25 – 11:50
Experimental Study of Charge Trapping Type FinFET Flash Memory
Yongjun Liu1, Toshihide Nabatame2, Takashi Matsukawa1, Kazuhiko Endo1, Sinichi O’uchi1, Junichiro Tsukada1, Hiromi Yamauchi1, Yuki Ishikawa1, Wataru Mizubayashi1, Yukinori Morita1, Shinji Migita1, Hiroyuki Ota1, Toyohiro Chikyow2, Meishoku Masahara1
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 MoS2 crystals and fabrication of a heterostructured with Graphene
Sachin Shinde, Kalita Golap, Subash Sharma, Remi Papon, Ritesh Kumar Vishwakarma
Nagoya Institute of Technology (NIT), Japan
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再生可能エネルギーの歴史を拓く変える
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長年に渡る世界No.1の耐久性能が
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