

# The Conference Theme

*“Emerging Topics and Advanced Electronics”*

## Table of Contents

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### Opening

9:15-9:20 Opening Remarks by M. Kimura (Ryukoku University)

### 9:20-9:50 Poster Short Presentation

### Keynote Speech-I

*Energy Harvesting and Energy Saving*

9:50-10:50

K-1 Nanostructure Thermoelectrics  
Yoshiaki Nakamura (Osaka University)

### 10:50-11:10 Authors' Interview & Break

### General Session –Circuits and Sensors-

11:10-11:30

G-1 Enhanced Mobile Robot Localization with Lidar and IMU Sensor  
Darren Ren-Yee Phang and Wai-Kong Lee (Universiti Tunku Abdul Rahman)  
Nobuto Matsuhira (Shibaura Institute of Technology)  
Michail Papoutsidakis (University of West Attica)

11:30-11:50 (Withdraw)

~~G-2 Standalone Solar PV Maximum Power Point Tracking Using Interval Type-2 Fuzzy Logic~~  
~~Angelo A. Beltran Jr. (Adamson University)~~

11:50-12:10

G-3 Recent Design Techniques for Improving Sensing Accuracy of Oscillator-based Sensor Interfaces in Standard CMOS Process  
Wei Zhou, Wang Ling Goh (Nanyang Technological University)  
Yuan Gao (Agency for Science, Technology and Research)

## **12:10-13:40 Lunch**

### **Energy Harvesting and Energy Saving**

13:40-14:10 (Invited)

E-1 Possibility of Dye-Sensitized Solar Cell as Energy Harvester  
Atsushi Fukui (Sharp Corp.)

14:10-14:40 (Invited)

E-2 Polymer Light-Emitting Devices with Selectively Transparent Photonic Crystals  
Consisting of Printed Inorganic/Organic Hybrid Dielectric Films  
Hirotake Kajii (Osaka University)

14:40-15:10 (invited)

E-3 Solid-State Lithium Thin-Film Batteries Capable of Fast Charging  
Taro Hitosugi (Tokyo Institute of Technology)

## **15:10-15:30 Authors' Interview**

Break (15:30-15:50)

### **Keynote Speech-II**

*Artificial Intelligence and Related Technology*

15:50-16:50

K-2 Physical Reservoir Computing Devices and Complex-Valued Neural Networks  
Akira Hirose, Ryosho Nakane, Gouhei Tanaka (University of Tokyo)

## **16:50-17:10 Authors' Interview**

### **Closing**

[17:10 – 17:40 Award Committee]

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## 9:15-10:40 Poster Presentation

### Special Session on Industry Activity

*-Analysis, Material & Process Technology-*

10:45-11:05 (Invited)

- S-1 Sub-Gap Defect States in Back-Channel-Etched Amorphous In-Ga-Zn-O TFTs Studied by Photoinduced Transient Spectroscopy  
Kazushi Hayashi and Mototaka Ochi (Kobe Steel, Ltd.)

11:05-11:25 (Invited)

- S-2 High Reliability InGaZnO TFT by Inductively Coupled Plasma Sputtering System  
Daisuke Matsuo, Ikeda Takuya, Shigeaki Kishida, Yoshitaka Setoguchi,  
And Yasunori Andoh (Nissin Electric Co., Ltd.)  
Ryoko Miyanaga, Mami N. Fujii, Yukiharu Uraoka (NAIST)

11:25-11:45 (Invited)

- S-3 Industrial Device Manufacturing Process Technologies toward the Future  
Masahiko Tanaka (SPP Technologies Co., Ltd.)

11:45-12:05 (Invited)

- S-4 The Recent Resolution and Detection Limit Improvement of EDS and EBSD with SEM  
Hirobumi Morita, Sam Marks, and Iain Anderson (Oxford Instruments)

## 12:05-14:15 Lunch

### General Session –Materials and Devices-

14:15-14:35

- G-4 Defect Evaluation of O<sub>2</sub>-annealed TaO<sub>x</sub> for Transparent ReRAM with High Resistance Ratio ( $R_{HRS}/R_{LRS} > 10^9$ )  
Soshun Doko, Yoriko Suda, Yoshiaki Ishii, and Masahiro Moniwa  
(Tokyo University of Technology)

14:35-14:55

- G-5 Impact of SiN Capping during Ohmic Annealing on Performance of GaN-Based MISHEMTs  
Shan Low, Shinsaku Kawabata, Joel Asubar, Hirokuni Tokuda and Masaaki Kuzuhara (University of Fukui)

14:55-15:15

- G-6 Microstructures of  $\epsilon$ -Ga<sub>2</sub>O<sub>3</sub> Thin Film on (100) TiO<sub>2</sub> Substrate by Mist Chemical Vapor Deposition

Daisuke Tahara, Hiroyuki Nishinaka, Yuta Arata, Kazuki Shimazoe, and Masahiro Yoshimoto (Kyoto Institute of Technology)

**Break (15:15-15:30)**

## **15:30-17:00 Power Devices, Materials and Analysis**

15:30-16:00 (Invited)

P-1 Limiting Factors of Inversion Layer Mobility in Si-Face 4H-SiC MOSFETs  
Munetaka Noguchi (Mitsubishi Electric)

16:00-16:30 (Invited)

P-2 Analysis and detection of dislocations in GaN  
Yukari Ishikawa (JFCC)

16:30-17:00 (Invited)

P-3 Process and Characterization of Vertical Ga<sub>2</sub>O<sub>3</sub> Transistors  
Masataka Higashiwaki (NICT)

## **17:00-17:20 Authors' interview & Break**

[Award Committee]

## **Awards & Closing Remark**

17:25-17:45 Award Presentation M. Yoshimoto (KIT)

17:45-17:50 Closing Remark M. Yoshimoto (KIT)

## Poster Papers

- PP-1. Effects of UV-LED Irradiation Towards Leaf-Lettuce Roots in Plant Factory  
Mitsuhiro Urano and Keisuke Uenishi (Osaka University)
- PP-2. Rapid Growth of Lettuce in Plant Factory with Sun Light and Night LED Lighting  
Iori Yamada and Akira Takahashi (National Institute of Technology, Nara College)
- PP-3. In-vitro experiments of artificial retina using TFTs and TFPTs  
Kohei Toyoda, Keisuke Tomioka, Keigo Misawa, Naoya, Naitou,  
and Mutsumi Kimura (Ryukoku University)
- PP-4. Ga-Sn-O TFT Fabricated with Al<sub>2</sub>O<sub>3</sub> Insulating Film  
Kazuki Hattori, Kenta Tanino, Mutsumi Kimura, and Tokiyoshi Matsuda  
(Ryukoku University)
- PP-5. Growth of  $\alpha$ - and  $\epsilon$ -Ga<sub>2</sub>O<sub>3</sub> Epitaxial Thin Films on LiTaO<sub>3</sub> Substrate  
Kazuki Shimazoe, Hiroyuki Nishinaka, Daisuke Tahara, Yuta Arata,  
and Masahiro Yoshimoto (Kyoto Institute of Technology)
- PP-6. Fabrication of Flexible and Epitaxial Metastable Ga<sub>2</sub>O<sub>3</sub> Thin Films on Synthetic Mica  
Using Oxide Buffer Layer  
Yuta Arata, Hiroyuki Nishinaka, Daisuke Tahara, Kazuki Shimazoe, Yusuke Ito,  
and Masahiro Yoshimoto (Kyoto Institute of Technology)
- PP-7. Crystal Growth of (Bi, La)<sub>4</sub>Ti<sub>3</sub>O<sub>12</sub> Using a Two Step Deposition Process  
Homare Yoshida, Yuta Miyabe, and Mutsumi Kimura (Ryukoku University)
- PP-8. A New Temperature-Stabilized Biosensor System for Phospholipid-Immobilized  
Cantilever Sensor to Detect Biomarker Amyloid Protein for Parkinson Disease  
Ryoko Kobayashi, Minoru Noda (Kyoto Institute of Technology)  
Masanori Sawamura, Hodaka Yamakado (Kyoto University)  
Masayuki Sohgawa (Niigata University)
- PP-9. Synapse Elements in Neural Network Based on Multilayer Cross-Point Device Using  
IGZO  
Takumi Tsuno, Jumpei Shimura, Atsushi Kondo, and Mutsumi Kimura  
(Ryukoku University)
- PP-10. Ga-Sn-O Thin Film Synapse for Neural Network  
Yuki Shibayama, Daiki Yamakawa, Yuki Onishi, and Mutsumi Kimura  
(Ryukoku University)  
Hiroki Yamane, Yasuhiko Nakashima (Nara Institute of Science and Technology)
- PP-11. Optical and Electrical Properties of Si Nanowire for Si Solar Cells  
Masaya Kuriyama, Hidenobu Mori, and Haruhiko Yoshida  
(University of Hyogo)

- PP-12. Sub-Micron Gate Fabrication Process for AlGaN/GaN HEMTs  
Ali Baratov, Takashi Ozawa, Joel T. Asubar, Hirokuni Tokuda, and Masaaki Kuzuhara (University of Fukui)
- PP-13. Study on Luminescence and Leakage Current of AlGaN/GaN HEMTs Biased near Off-State Breakdown  
Shunsuke Kamiya, Takashi Nishitani, Joel T. Asubar, Hirokuni Tokuda, and Masaaki Kuzuhara (University of Fukui)
- PP-14. The Impact of Doping Concentration on the Electrical Characteristics of Z2-FET  
Yu Yabuuchi, Shingo Sato (Kansai University)  
Yasuhisa Omura (Academic Collaboration Associate)
- PP-15. Simulation of Optical Gain in Semiconductor Laser Structure with h-BCN Active Layer  
Daisuke Maki, Matsuto Ogawa, and Satofumi Souma (Kobe University)
- PP-16. Simulation of Graphene FET Gated by Ionic Liquid  
Koki Arihori, Matsuto Ogawa and Satofumi Souma (Kobe University)  
Junko Sato-Iwanaga (Panasonic Corporation)
- PP-17. In-Ga-Zn-O Film Thickness Dependence of Memristor Characteristic for Resistive Random Access Memory  
Kaito Hashimoto, Ayata Kurasaki, Mutsumi Kimura, and Tokiyoshi Matsuda (Ryukoku University)
- PP-18. Characterization and Reduction of the Tail States in GaAsBi Alloy  
Sho Hasegawa, Kakuyama Kyohei, Hiroyuki Nishinaka, and Masahiro Yoshimoto (Kyoto Institute of Technology)