



# PROGRAM

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# AM-FPD 21

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THE TWENTY-EIGHTH INTERNATIONAL WORKSHOP ON  
**ACTIVE-MATRIX  
FLATPANEL DISPLAYS AND DEVICES**  
-TFT TECHNOLOGIES AND FPD MATERIALS-

June 29 - July 2, 2021  
Online Virtual Meeting

**Sponsorship:**

International Society of Functional Thin Film Materials & Devices

**Co-Sponsorship:**

The Japan Society of Applied Physics

**Technical Sponsorship:**

The Electrochemical Society - Electronics and Photonics Division -

The Electrochemical Society - Japan Section -

IEEE Electron Devices Society

**In cooperation with:**

The Institute of Electronics, Information and Communication Engineers

The Institute of Image Information and Television Engineers

The Institute of Electrical Engineers of Japan

The Chemical Society of Japan

The Laser Society of Japan

Japanese Liquid Crystal Society

Thin Film Materials & Devices Meeting

# GENERAL INFORMATION

The 28th International Workshop on Active-Matrix Flatpanel Displays and Devices (AM-FPD '21) will be held as an online meeting from June 29 (Tuesday) to July 2 (Friday), 2021. This international workshop was established in 1994 to present the latest research and development in Active Matrix Liquid Crystal Display technologies and their applications. In addition to AMLCDs and AMOLEDs, the scope has been widened to novel flat panel displays, materials for displays, flexible technologies, related physical phenomena and novel thin-film devices such as thin-film transistors (TFT), photovoltaics (PV) technologies, and other thin-film materials and devices (TFMD).

We hope that you will attend and enjoy our workshop.

## **WORKSHOP THEME**

AM-FPD '21 will prepare an attractive program focusing on “*Shoot the Future on the New Platform*”.

## **SYMPOSIA**

In addition to the regular sessions, we will prepare symposia which numerous speakers discuss for attractive and interesting themes.

Special Symposium on Vehicular Displays will focus on exciting developments paving the future of invehicle displays. The automotive industry is currently experiencing profound changes in its business environment, which will also have a strong impact on design and requirements of the human-vehicular interface, specifically displays.

On July 1, symposia, “*Variety of TFT Technologies for Emerging Applications*”, “*Advanced Materials and Processes for Next Generation PVs*” and “*Development of Fabrication and Analysis for Thin Film Devices*” are scheduled. Invited speakers will talk about the latest topics from the viewpoints of functional materials, device structures, fabrication processes, driving schemes, circuit technologies, etc.

## **PRESENTATION TIMES FOR SPEAKERS**

	Total	Presentation	Discussion
Keynote	30 min.	25 min.	5 min.
Special Symposium	40 min.	35 min.	5 min.
Invited	25 min.	20 min.	5 min.
Symposium	30 min.	25 min.	5 min.
Oral	20 min.	15 min.	5 min.
Poster	15:30-17:40, July 1		

## **THE PROCEEDINGS OF AM-FPD '21**

The Proceedings of AM-FPD '21 will be distributed in our workshop special website from June 29.

## **LANGUAGE**

The official language of the workshop is English.

## **REGISTRATION**

For Registration, access our online registration page (<http://www.amfpd.jp>) and enroll your information and complete payment. Registration fee is discounted until June 10 (JST). Registration and other fees should be paid in Japanese yen via bank transfer\*1 or credit cards. VISA, Master, DC, AMEX, Diners, Nicos and JCB are acceptable. After your payment has been confirmed, confirmation can be downloaded from our online registration page.

\*1 Registrants living in Japan can make payment via bank transfer or credit cards. Registrants living overseas can make payment by credit cards only.

Category	Advance Registration Fee until June 10, 2021 (JST)	Registration Fee	[One day] Special Symposium Only*3
<b>WORKSHOP*2</b>			
Member*4	¥45,000	¥50,000	¥35,000
Non-Member	¥47,000	¥52,000	
Student	¥15,000	¥17,000	
<b>TUTORIAL</b>			
Regular	Tutorial Only	¥7,000	
	Conference Attendee	¥5,000	
Student		Free	

\*2 The registration fee of the workshop includes the admission to all sessions and the proceedings. No banquet will be scheduled.

\*3 One day pass of "Special Symposium Only" is available to attend Special Symposium on Wednesday, June 30. The proceedings of the AMFPD '21 is included in the fee.

\*4 The member of the societies which sponsor and support AM-FPD '21 (see the front cover).

## **ON-DEMAND VIEWING**

The presentation accepted to deliver by the author will be recorded and available for the participants to watch until July 31, 2021.

## **CANCELLATION POLICY**

In case of cancellation, a written notification should be sent to NTA by e-mail ([am\\_fpd@nta.co.jp](mailto:am_fpd@nta.co.jp)) or by FAX (+81-43-225-2241) to avoid any trouble.

### Cancel Charge

After June 11-----100% of the registration fee / NO REFUND

The Proceedings of the AM-FPD '21 (download password) will be sent to the attendees who have paid in 100% cancellation charge after the workshop.

### **Nippon Travel Agency Co., Ltd.(NTA) Chiba Branch**

Chiba Center Square Bldg. 4F, 2-3-16, Chuo, Chuo-ku, Chiba  
260-0013, Japan

Fax: +81-43-225-2241 Tel: +81-43-227-2307

E-mail: [am\\_fpd@nta.co.jp](mailto:am_fpd@nta.co.jp)

## Endorsement Letter

The endorsement letters to IEEE Journal Electron Device Society (J-EDS) or ECS Journal Solid State Science and Technology (JSS) will be issued for excellent papers, which are chosen at our internal rating processes by AMFPD program committees.

Please select which journal you wish getting the endorsement letter when you submit a paper to AM-FPD.

1. Endorsement letters will be issued to excellent papers from the AM-FPD committee after AM-FPD '21 workshop is held.
2. After you receive the endorsement letter,
  - Please attach your paper of AM-FPD '21 and the endorsement letter when submitting your manuscript to each journal,
  - You make sure to add in your reference list when you reuse the contents (figures / tables) used in your paper of AM-FPD '21.

Your ID and password are required to be registered before submitting your manuscript to each journal.

## IEEE XPLORE DIGITAL LIBRARY

The Proceedings of AM-FPD '21 will be published in the IEEE Xplore digital library in around 2 months after the workshop.

## TUTORIAL

These classes are widely aimed at many people from beginners to researchers who hope to review their knowledge. Presentations and documents will be in Japanese. Documents will be distributed to the attendees who have registered in advance. These classes are available for an additional fee (see page 2).

**Tuesday, June 29** (10 : 00 ~ 12 : 00)

**Chairperson :** Y. Uraoka, *NAIST, Japan*

10:00 (T-1)      Flexible Display Device Technology and Applications  
Hiroyuki Okada, *Univ. of Toyama, Japan*

11:00 (T-2)      Basic Photovoltaic Principles and Fabrication Methods  
Yasuyoshi Kurokawa, *Nagoya Univ., Japan*

## AWARDS

Papers presented at this workshop will be considered for “AM-FPD Paper Awards”, “AMFPD-ECS Japan Section Young Researcher Award”. These winners will be presented at the award ceremony in AM-FPD '22 workshop.

### AM-FPD Paper Awards

“Best Paper Award”, “Poster Award” and “Student Paper Award” will be presented. The winners of them are selected by AMFPD '21 award committee chaired by Professor Yukiharu Uraoka (NAIST).

### AMFPD-ECS Japan Section Young Researcher Award

ECS Japan Section and AM-FPD Organizing Committee have jointly established “AMFPD-ECS Japan Section Young Researcher Award”. This award will be given to the author under the age of 35 that belongs to the university or the research institute in Japan.

## AM-FPD '20 PAPER AWARD

### Best Paper Award

- (4-2) Characteristics of Noble-Gas-Ion-Implanted Amorphous-InGaZnO Films on Glass  
Toshimasa Ui<sup>1</sup>, Ryugo Fujimoto<sup>1</sup>, Toshihiko Sakai<sup>2</sup>, Daisuke Matsuo<sup>2</sup>, Yoshitaka Setoguchi<sup>2</sup>, Yasunori Andoh<sup>2</sup>, Junichi Tatemichi<sup>1</sup>, <sup>1</sup>NISSIN ION EQUIPMENT CO., LTD., Japan, <sup>2</sup>NISSIN ELECTRIC CO., LTD., Japan

### Poster Paper Award

- (P-1) Deuteration of Pentacene Using Deuterium Gas and Heated Catalyst  
Akira Heya<sup>1</sup>, Ryo Yamasaki<sup>2</sup>, Koji Sumitomo<sup>1</sup>, <sup>1</sup>Univ. of Hyogo., Japan, <sup>2</sup>Tocalo Co., Ltd., Japan

### Student Paper Award

Pongsakorn Sihapitak, Nara Inst. of Sci. and Technol., Japan

- (P-4) Relationship of Phase Shift Mask Design and Size of Three-Dimension Nanostructures

### AMFPD-ECS Japan Section Young Researcher Award

Yugo Takashima, Hokkaido Univ., Japan

- (4-3) Fabrication and Characterization of Ba<sub>1/3</sub>CoO<sub>2</sub> Epitaxial Films Exhibiting Thermoelectric ZT = 0.12 at Room Temperature

## **ORGANIZING COMMITTEE**

**Chair:** Hiroki Hamada (*Kinki Univ.*)  
**Vice-Chair:** Hiroshi Tsutsu (*PVTEC*)  
**Members:** Junya Kiyota (*ULVAC*)  
Yue Kuo (*Texas A&M Univ.*)  
Atsushi Masuda (*Niigata Univ.*)  
Nobuo Sasaki (*Sasaki Consulting*)  
Kozo Ishida (*Mitsubishi Electric*)

**Advisor :** Hideya Kumomi (*Tokyo Inst. of Technol.*)  
Makoto Ohkura  
Akira Okada

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Shin-Ichiro Kuroki (*Hiroshima Univ.*)  
Naoto Matsuo (*Univ. of Hyogo*)  
Hiroyuki Okada (*Univ. of Toyama*)

## PROGRAM COMMITTEE

- Chair:** Hiroyuki Okada (*Univ. of Toyama*)
- Vice-Chairs:** Masatoshi Kitamura (*Kobe Univ.*)  
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Chih-Lung Lin (*Nat'l Cheng Kung Univ.*)  
Norbert Fruehauf (*Univ. of Stuttgart*)  
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- Members:** Byung Seong Bae (*Hoseo Univ.*)  
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Takashi Noguchi (*Univ. of the Ryukyus*)  
Kazumasa Nomoto (*Sony Group*)  
Keisuke Omoto (*Apple*)  
Shyam S. Pandey (*Kyushu Inst. of Technol.*)  
Taizoh Sadoh (*Kyushu Univ.*)  
Kimihiko Saito (*Fukushima Univ.*)  
Nobuyoshi Saito (*Kioxia*)  
Ruud E. I. Schropp (*Univ. of the Western Cape*)  
Bernhard Straub (*Steinbeis-Consulting Center*)  
Isao Suzumura (*Japan Display*)  
Kazushige Takechi (*Tianma Japan*)  
Taishi Takenobu (*Nagoya Univ.*)  
Masaya Tamaki (*KYOCERA Corp.*)  
Yung-Hui Yeh (*ITRI*)  
Atsushi Wakamiya (*Kyoto Univ.*)

# PROGRAM

Date: Tuesday, June 29

## Opening Session (13 : 00~13 : 15)

### Welcome Address

H. Hamada, *Kinki Univ., Japan*

### Award Presentation

## Session1 :Keynote (13 : 15~14 : 20)

Chairpersons : Y. Uraoka, *NAIST, JAPAN*

H. Okada, *Univ. of Toyama, JAPAN*

13:20-13:50 **1\_1 Modulation Spectroscopies for The Characterization of Electronic Properties in Organic Semiconductor Devices (INVITED)**

H. Naito<sup>1,\*</sup>

<sup>1)</sup> *Osaka Prefecture Univ., JAPAN*

13:50-14:20 **1\_2 Novel Passivating Contacts for Silicon Photovoltaics (INVITED)**

T. Matsui<sup>1,\*</sup> and H. Sai<sup>1)</sup>

<sup>1)</sup> *Global Zero Emission Res. Ctr., Nat'l Inst. of Advanced Industrial Sci. and Technol.(AIST), JAPAN*

— Break —

## Session2 :New Trends in Science and Technology for PVs R&D

(14 : 30~15 : 40)

Chairpersons : K. Saito, *Fukushima Univ., JAPAN*

N. Matsuki, *Kanagawa Univ., JAPAN*

14:35-15:00 **2\_1 Application of Machine Learning for Crystal Growth of Bulk and Film Silicon (INVITED)**

K. Kutsukake<sup>1,\*</sup>

<sup>1)</sup> *RIKEN, JAPAN*

15:00-15:20 **2\_2 Activation of 300-Mm-Diameter-Phosphorus-Implanted Silicon Substrates by Wireless Carbon Heating Tubes**

S. Saito<sup>1,\*</sup>, K. Onodera<sup>1)</sup>, T. Miyazaki<sup>1,2)</sup>, T. Uehara<sup>1)</sup>, T. Arima<sup>1)</sup>, M. Hasumi<sup>1)</sup>, G. Kobayashi<sup>3)</sup>, I. Serizawa<sup>3)</sup>, W. Kubo<sup>1)</sup>, T. Ueno<sup>1)</sup> and T. Sameshima<sup>1)</sup>

<sup>1)</sup> *Tokyo Univ. of Agriculture and Technol., JAPAN*, <sup>2)</sup> *Techno Research., Ltd., JAPAN*, <sup>3)</sup> *ORC MANUFACTURING Co., Ltd., JAPAN*



- 15:20-15:40 2\_3 Peeling Technique by Two-Dimensional MoSe<sub>2</sub> Atomic Layer for Bifacial-Flexible Cu(In,Ga)Se<sub>2</sub> Solar Cells**  
T. Nishimura<sup>1,\*</sup>, A. Mavlonov<sup>1</sup>, J. Chantana<sup>1</sup>, Y. Kawano<sup>1</sup> and T. Minemoto<sup>1</sup>  
<sup>1</sup> *Ritsumeikan Univ., JAPAN*

— *Break* —

## **Special Session :Next Stage of Displays** (15 : 50~17 : 10)

**Chairpersons :** K. Nomoto, *Sony Group, JAPAN*  
K. Omoto, *Apple, JAPAN*

- 15:55-16:20 SP\_1 Ferroelectric Liquid Crystal Pixels with Extremely Small Pixel Pitch for Holographic Displays (INVITED)**  
S. Aso<sup>1,\*</sup>, K. Aoshima<sup>1</sup>, R. Higashida<sup>1</sup>, N. Funabashi<sup>1</sup>, J. Shibasaki<sup>1</sup>, T. Ishinabe<sup>2</sup>, Y. Shibata<sup>2</sup>, H. Fujikake<sup>2</sup> and K. Machida<sup>1</sup>  
<sup>1</sup> *Sci. & Technol. Res. Labs.(STRL), Japan Broadcasting Corp.(NHK), JAPAN,* <sup>2</sup> *Tohoku Univ., JAPAN*
- 16:20-16:45 SP\_2 Redundant Pixel Design and External Mura Compensation for LTPS TFT Full Color MicroLED Display (INVITED)**  
K. Imaizumi<sup>1,\*</sup>, M. Tamaki<sup>1</sup>, K. Aoki<sup>1</sup>, R. Yokoyama<sup>1</sup>, S. Nakamitsu<sup>1</sup>, H. Ito<sup>1</sup>, K. Yamanoguchi<sup>1</sup>, M. Nishide<sup>1</sup>, F. Rahadian<sup>1</sup>, S. Matsuda<sup>1</sup>, E. Lang<sup>2</sup> and L. Hoeppe<sup>2</sup>  
<sup>1</sup> *Kyocera Corp., JAPAN,* <sup>2</sup> *OSRAM Opto Semiconductors GmbH, GERMANY*
- 16:45-17:10 SP\_3 OLED, MiniLED, MicroLED and QNED: The Battle for The Next Generation of Televisions (INVITED)**  
Z. Bouhamri<sup>1,2,\*</sup> and E. Virey<sup>1</sup>  
<sup>1</sup> *Yole Developement, FRANCE,* <sup>2</sup> *Yole KK, JAPAN*

Date: Wednesday, June 30

**Special Symposium1 :The Future Vehicle Displays** (10 : 00~10 : 45)

**Chairpersons :** H. Okada, *Univ. of Toyama, JAPAN*  
Y. Uraoka, *NAIST, JAPAN*

10:05-10:45 SS1\_1 A Novel Fully Transparent Photoluminescent Display (INVITED)

T. Sun<sup>1,\*</sup>)

<sup>1)</sup> *Sun Innovations Inc., USA*

**Special Symposium2 :Forecast of Display Market** (10 : 45~11 : 30)

**Chairpersons :** Y. Uraoka, *NAIST, JAPAN*  
H. Okada, *Univ. of Toyama, JAPAN*

10:50-11:30 SS2\_1 Display-Based HMI in The Software Defined Vehicle Era (INVITED)

S. Wu<sup>1,\*</sup>)

<sup>1)</sup> *Omdia,TAIWAN*

— *Lunch* —

**Special Symposium3 :Key Devices and Developments  
for Vehicle Display** (13 : 00~14 : 25)

**Chairpersons :** M. Miyakawa, *NHK, JAPAN*  
T. Miyadera, *AIST, JAPAN*

13:05-13:45 SS3\_1 Active Matrix Micro-Electromechanical-Systems Based Displays (INVITED)

N. Fruehauf<sup>1,\*</sup>)

<sup>1)</sup> *Univ. of Stuttgart, GERMANY*

13:45-14:25 SS3\_2 Wide -Color Gamut OLED Technologies for High-Luminance Operation at High Temperature (INVITED)

K. Hamada<sup>1,\*</sup>), S. Mori<sup>1)</sup> and H. Tanabe<sup>1)</sup>

<sup>1)</sup> *Tianma Japan, Ltd., JAPAN*

— *Break* —

**Special Symposium4 :Trends for Future Vehicle Display** (14 : 40~15 : 25)

**Chairpersons :** M. Kimura, *Ryukoku Univ., JAPAN*  
K. Omoto, *Apple, JAPAN*

**14:45-15:25 SS4\_1 Automotive Displays – Trends and Technologies (INVITED)**  
D. S. Hermann<sup>1,\*</sup>  
<sup>1)</sup> *Volvo Car Corp., SWEDEN*

— *Break* —

**Special Symposium5 :Future and Lighting Application  
for Vehicle Display** (15 : 40~17 : 05)

**Chairpersons :** M. Kimura, *Ryukoku Univ., JAPAN*  
K. Omoto, *Apple, JAPAN*

**15:45-16:25 SS5\_1 Flexible OLED Lighting and Signage for Automotive Application (INVITED)**  
C. May<sup>1,\*</sup>  
<sup>1)</sup> *Fraunhofer Inst. for Organic Electronics, Electron Beam and Plasma Technol. FEP, GERMANY*

**16:25-17:05 SS5\_2 The Challenges of Adapting Displays Into New Car Interiors (INVITED)**  
M. Stegemann<sup>1,\*</sup>  
<sup>1)</sup> *Via Optronics AG, GERMANY*

Date: Thursday, July 1

## Symposium1 :Variety of TFT Technologies for Emerging Applications

(9 : 25~11 : 00)

**Chairpersons :** H. Okada, *Univ. of Toyama, JAPAN*

M. Kitamura, *Kobe Univ., JAPAN*

**09:30-10:00 S1\_1 Vacuum Field Emission Transistor in Nanometer Era (INVITED)**

J. Han<sup>1,\*</sup>

<sup>1)</sup> *Center for Nanotechnology, NASA Ames Research Center, USA*

**10:00-10:30 S1\_2 Skin-Like Sensor Systems by Intrinsically Stretchable Electronic Materials (INVITED)**

N. Matsuhisa<sup>1,2,3,\*</sup>

<sup>1)</sup> *Keio Univ., JAPAN*, <sup>2)</sup> *Keio Global Res. Inst., JAPAN*, <sup>3)</sup> *Japan Sci. and Technol. Agency, PRESTO, JAPAN*

**10:30-11:00 S1\_3 Gigahertz Large-Area Electronic Devices and Circuits for Wireless Applications (INVITED)**

C. Wu<sup>1,\*</sup>, Y. Ma<sup>1</sup>, Y. Mehlman<sup>1</sup>, S. Wagner<sup>1</sup>, J.C. Sturm<sup>1</sup> and N. Verma<sup>1</sup>

<sup>1)</sup> *Princeton Univ., USA*

— *Break* —

## Symposium2 :Advanced Materials and Processes

**for Next Generation PVs** (11 : 10~12 : 45)

**Chairpersons :** T. Miyadera, *AIST, JAPAN*

A. Wakamiya, *Kyoto Univ., JAPAN*

**11:15-11:45 S2\_1 Technologies to Improve The Profitability of Silicon PV Module Recycling (INVITED)**

M. Tao<sup>1,\*</sup>

<sup>1)</sup> *Arizona State Univ., USA*

**11:45-12:15 S2\_2 Band Offset Engineering in Cu<sub>2</sub>O-Based Heterojunctions for High-Efficiency Tandem Photovoltaics (INVITED)**

N. Nakagawa<sup>1,\*</sup>, S. Shibasaki<sup>1</sup>, Y. Honishi<sup>1</sup>, Y. Mizuno<sup>1</sup>, Y. Nishida<sup>1</sup>, M. Yamazaki<sup>1</sup> and K. Yamamoto<sup>1</sup>

<sup>1)</sup> *Toshiba Corp., JAPAN*

**12:15-12:45 S2\_3 Development of  $\pi$ -Conjugated Materials for Efficient Organic Solar Cells (INVITED)**

I. Osaka<sup>1,\*</sup>

<sup>1)</sup> *Hiroshima Univ., JAPAN*

— *Lunch* —

## Symposium3 :Development of Fabrication and Analysis for Thin Film Devices (13 : 45~ 15 : 20)

**Chairpersons :** H. Kajii, *Osaka Univ., JAPAN*  
A. Heya, *Univ. of Hyogo, JAPAN*

- 13:50-14:20 S3\_1 Low-Temperature Solid-Phase Crystallization of Group IV Material Thin Films (INVITED)**  
K. Toko<sup>1,\*</sup>  
<sup>1)</sup> *Univ. of Tsukuba, JAPAN*
- 14:20-14:50 S3\_2 Silicon Spintronics for Electronic Devices (INVITED)**  
M. Shiraishi<sup>1,\*</sup>  
<sup>1)</sup> *Kyoto Univ., JAPAN*
- 14:50-15:20 S3\_3 Growth of A High Quality GaN Wafer From Point Seeds by The Na-Flux Method (INVITED)**  
M. Imanishi<sup>1,\*</sup>, S. Usami<sup>1)</sup>, M. Maruyama<sup>1)</sup>, M. Yoshimura<sup>1)</sup> and Y. Mori<sup>1)</sup>  
<sup>1)</sup> *Osaka Univ., JAPAN*

— Break —

## Poster Session (15 : 30~17 : 40)

### FPD p

- P\_01 LTPS Pixel Circuit Using Additional Capacitor Structure to Prevent Leakage Current for Low-Frame-Rate Displays**  
Y. Chen<sup>1,\*</sup>, B. Chen<sup>1)</sup>, J. Chang<sup>1)</sup> and C. Lin<sup>1)</sup>  
<sup>1)</sup> *Nat'l Cheng Kung Univ., TAIWAN*
- P\_02 Characteristics of Argon-Ion-Implanted Amorphous-InGaZnO**  
K. Yasuta<sup>1,\*</sup>, T. Ui<sup>1)</sup>, T. Ikeda<sup>2)</sup>, D. Matsuo<sup>2)</sup>, T. Sakai<sup>2)</sup>, S. Dohi<sup>1)</sup>, Y. Setoguchi<sup>2)</sup>, E. Takahashi<sup>2)</sup>, Y. Andoh<sup>2)</sup> and J. Tatemichi<sup>1)</sup>  
<sup>1)</sup> *NISSIN ION EQUIPMENT CO., LTD., JAPAN*, <sup>2)</sup> *NISSIN ELECTRIC CO., LTD., JAPAN*

### TFT p

- P\_03 Effects of Germanium Composition on Performance of Continuous-Wave Laser Lateral Crystallization N-Channel Polycrystalline Silicon-Germanium Thin-Film Transistors on Glass Substrate**  
A. Hara<sup>1,\*</sup> and K. Kitahara<sup>2)</sup>  
<sup>1)</sup> *Tohoku Gakuin Univ., JAPAN*, <sup>2)</sup> *Shimane Univ., JAPAN*
- P\_04 Non-Volatile Memory Using A Ga-Sn-O TFT with A Stacked Gate Insulator Film of SiO<sub>2</sub> and (Bi,La)<sub>4</sub>Ti<sub>3</sub>O<sub>12</sub>**  
T. Fukui<sup>1,\*</sup>, K. Nakagawa<sup>1)</sup> and M. Kimura<sup>1)</sup>  
<sup>1)</sup> *Ryukoku Univ., JAPAN*

### TFMD p

- P\_06 Ferroelectric Thin Film for A Capacitor-Type Synapse in Neuromorphic Systems**  
Y. Ishisaki<sup>1,\*</sup>, H. Umemura<sup>1)</sup>, D. Matsukawa<sup>1)</sup>, E. Tokumitsu<sup>2)</sup> and M. Kimura<sup>1)</sup>  
<sup>1)</sup> *Ryukoku Univ., JAPAN*, <sup>2)</sup> *Japan Advanced Inst. of Sci. and Technol.(JAIST), JAPAN*
- P\_07 Stacked Cross-Point Memory Using IGZO Thin Film for Synaptic Elementes**  
E. Iwagi<sup>1,\*</sup> and M. Kimura<sup>1,2)</sup>  
<sup>1)</sup> *Ryukoku Univ., JAPAN*, <sup>2)</sup> *Nara Inst. of Sci. and Technol.(NAIST), JAPAN*

- P\_08 Investigation of Orientation in The Thin Films of Conjugated Polymer and NIR Dye Blends Fabricated by Friction Transfer Method**  
 Y. Kurokawa<sup>1,\*</sup>, S. Nagamatsu<sup>1</sup> and S.S. Pandey<sup>1</sup>  
<sup>1)</sup> *Kyushu Inst. of Technol., JAPAN*
- P\_09 Structural and Electrical Properties of Nanographene Prepared From Pentacene by Hot Mesh Deposition and Soft X-Ray Irradiation**  
 A. Heya<sup>1,\*</sup>, M. Niibe<sup>1</sup>, K. Kanda<sup>1</sup>, R. Yamasaki<sup>2</sup> and K. Sumitomo<sup>1</sup>  
<sup>1)</sup> *Univ. of Hyogo, JAPAN*, <sup>2)</sup> *Tocalo Co., Ltd., JAPAN*
- P\_10 GTO Thin Film Thermoelectric Conversion Device Manufactured by RF Magnetron Sputtering Method**  
 Y. Yamamoto<sup>1,\*</sup>, T. Aramaki<sup>1</sup>, R. Ito<sup>1</sup> and M. Kimura<sup>1</sup>  
<sup>1)</sup> *Ryukoku Univ., JAPAN*
- P\_11 Improved Carrier Mobility of Poly-Ge Ultrathin Films on Insulator by Solid-Phase Crystallization Combined with A-Si Capping Layers**  
 R. Hara<sup>1,\*</sup>, M. Chiyozone<sup>1</sup> and T. Sadoh<sup>1</sup>  
<sup>1)</sup> *Kyushu Univ., JAPAN*
- P\_12 Improvement of GeO<sub>2</sub>/Ge Interface Characteristics by Hf-Post Metallization Annealing and Hf-Post Metallization Oxidation**  
 H. Horiguchi<sup>1</sup>, H. Ino<sup>1,\*</sup>, Y. Iwazaki<sup>1</sup> and T. Ueno<sup>1</sup>  
<sup>1)</sup> *Tokyo Univ. of Agriculture and Technol., JAPAN*
- P\_13 Fabrication of High-Performance Ge-MOS Structure Using Al<sub>2</sub>O<sub>3</sub>/TiO<sub>2</sub> Stacked Gate Insulating Film**  
 K. Toyoda<sup>1</sup>, K. Ito<sup>1,\*</sup>, Y. Iwazaki<sup>1</sup> and T. Ueno<sup>1</sup>  
<sup>1)</sup> *Tokyo Univ. of Agriculture and Technol., JAPAN*
- P\_14 Low-Temperature Solid-Phase Crystallization of High-Sn Concentration SiSn on Insulator**  
 K. Okamoto<sup>1,\*</sup>, T. Kosugi<sup>1</sup> and T. Sadoh<sup>1</sup>  
<sup>1)</sup> *Kyushu Univ., JAPAN*

## **LATE NEW p**

- P\_L1 Four-Terminal Polycrystalline-Silicon Thin-Film Transistors with High-K HfO<sub>2</sub> Dielectric on Glass Substrate**  
 K. Kudo<sup>1</sup>, J. Kimura<sup>1</sup>, T. Suzuki<sup>1</sup>, N. Nishiguchi<sup>1</sup> and A. Hara<sup>1,\*</sup>  
<sup>1)</sup> *Tohoku Gakuin Univ., JAPAN*
- P\_L2 Performance Improvement of Solution-Processed Organic Floating-Gate Transistor Memories via Tuning The Work Function of Gate Electrodes**  
 N. Nishida<sup>1,\*</sup>, S. Tazuhara<sup>1</sup>, R. Hattori<sup>1</sup>, M. Higashinakaya<sup>1</sup>, T. Nagase<sup>1</sup>, T. Kobayashi<sup>1</sup> and H. Naito<sup>1</sup>  
<sup>1)</sup> *Osaka Prefecture Univ., JAPAN*
- P\_L3 Fabrication of Lead Halide Perovskite Thin Films by Laser Alternate Deposition : Variation of Physical Properties with Layered Structure**  
 N. Matsuki<sup>1,\*</sup>, Y. Iida<sup>1</sup>, K. Kamada<sup>1</sup>, S. Toda<sup>1</sup> and T. Sato<sup>1</sup>  
<sup>1)</sup> *Kanagawa Univ., JAPAN*

Date: Friday, July 2

**Session3 :FPD** (9 : 25~10 : 35)

**Chairpersons :** T. Mori, *Aichi Inst. of Technol., JAPAN*  
R. Hattori, *Kyushu Univ., JAPAN*

**09:30-09:55 3\_1 Novel Flexible Films with High Gas Barrier Layers by Sputtering and ALD (INVITED)**

M. Kodon<sup>1,\*</sup>, M. Sugimoto<sup>1</sup>, N. Kawamura<sup>1</sup>, T. Yuki<sup>1</sup> and H. Nakada<sup>1</sup>  
<sup>1</sup> *Innovation Center for Organic Electronics (INOEL), Yamagata Univ., JAPAN*

**09:55-10:15 3\_2 New Pixel Circuit with Negative Feedback Scheme for AMOLED Smartwatch Displays**

J. Chang<sup>1,\*</sup>, L. Shih<sup>2</sup> and C. Lin<sup>1</sup>  
<sup>1</sup> *Nat'l Cheng Kung Univ., TAIWAN*, <sup>2</sup> *AU Optronics Corp., TAIWAN*

**10:15-10:35 3\_3 Inverted ZnCuInS/ZnS-Based Quantum-Dot Light-Emitting Diodes with Substrate Temperature Variation of Sputtered ZnO Film**

M.M.R. Biswas<sup>1,\*</sup> and H. Okada<sup>1</sup>  
<sup>1</sup> *Univ. of Toyama, JAPAN*

— *Break* —

**Session4 :Novel Fabrication Processing and Applications** (10 : 45~11 : 55)

**Chairpersons :** A. Heya, *Univ. of Hyogo, JAPAN*  
H. Kajii, *Osaka Univ., JAPAN*

**10:50-11:15 4\_1 Electret-Based Vibrational Energy Generator Composed of Polarmolecules for OLED (INVITED)**

Y. Tanaka<sup>1,2,\*</sup>, N. Matsuura<sup>1</sup>, Y. Tazo<sup>1</sup>, H. Kayaguchi<sup>1</sup> and H. Ishii<sup>1</sup>  
<sup>1</sup> *Chiba Univ., JAPAN*, <sup>2</sup> *Japan Sci. and Technol. Agency, PRESTO, JAPAN*.

**11:15-11:35 4\_2 Double-Layer ReRAM with In-Ga-Zn-O Thin Film for Neuromorphic**

T. Katagiri<sup>1,\*</sup>, K. Morigaki<sup>1</sup>, K. Yachida<sup>1</sup> and M. Kimura<sup>1</sup>  
<sup>1</sup> *Ryukoku Univ., JAPAN*

**11:35-11:55 4\_3 Oxygen Ratio Effect on Zinc Oxide Films Fabricated by Radio Frequency Magnetron Sputtering for Photoluminescence Type Gas Sensor Application**

H.S. Wai<sup>1,\*</sup>, T. Ueda<sup>1</sup> and C. Li<sup>1</sup>  
<sup>1</sup> *Kochi Univ. of Technol., JAPAN*

— *Lunch* —

**Session5 :Oxide TFT Technology** (13 : 00~14 : 10)

**Chairpersons :** T. Nagase, *Osaka Prefecture Univ, JAPAN*  
N. Saito, *Kioxia, JAPAN*

**13:05-13:30 5\_1 LTPO Driving Technology for The Next Generation (INVITED)**

J.C. Kim<sup>1,2,\*</sup>, J.S. Yoo<sup>2</sup>, H.W. Hwang<sup>2</sup>, H.C. Choi<sup>2</sup>, Y.M. Ha<sup>2</sup> and H.J. Kim<sup>1</sup>  
<sup>1</sup> *Yonsei Univ., KOREA*, <sup>2</sup> *LG Display, KOREA*

- 13:30-13:50 **5\_2 High-K Solution Processed Hybrid Gate Insulators for Amorphous Oxide Thin-Film Transistors and Its Temperature and Thickness Dependence**  
J.P. Bermundo<sup>1,\*</sup>, P. Kesorn<sup>1</sup>, N. Yoshida<sup>1</sup> and Y. Uraoka<sup>1</sup>  
<sup>1</sup> *Nara Inst. of Sci. and Technol.(NAIST), JAPAN*
- 13:50-14:10 **5\_3 Performance Enhancement of Solution-Processed In-Zn-O Thin-Film Transistors via Low-Temperature Wet Annealing Ambients**  
M.P.A. Jallorina<sup>1,\*</sup>, J.P.S. Bermundo<sup>1</sup> and Y. Uraoka<sup>1</sup>  
<sup>1</sup> *Nara Inst. of Sci. and Technol.(NAIST), JAPAN*

— Break —

## **Session6 :Artificial TFT Applications & Sensor** (14 : 20~15 : 30)

**Chairpersons :** T. Takenobu, *Nagoya Univ., JAPAN*  
K. Takechi, *Tianma Japan, JAPAN*

- 14:25-14:50 **6\_1 Artificial Synapse Based on MoS<sub>2</sub> Memtransistor for In-Memory Computing (INVITED)**  
K. Ang<sup>1,2,\*</sup>  
<sup>1</sup> *Nat'l Univ. of Singapore, SHINGAPORE*, <sup>2</sup> *Agency for Sci., Technol. and Res.<sup>A\*STAR</sup>, SHINGAPORE*
- 14:50-15:10 **6\_2 Study on Bulk-Heterojunction Organic Photodetectors Based on Inverted Structure Toward Near-Infrared Narrowband-Light Detection Devices**  
H. Kajii<sup>1,\*</sup> and M. Kondow<sup>1</sup>  
<sup>1</sup> *Osaka Univ., JAPAN*
- 15:10-15:30 **6\_3 Comparison of Switching TFT Operation in Output Frequency Dependence of The Artificial Retina Using LTPS-TFT**  
K. Toyoda<sup>1,\*</sup>, N. Naitou<sup>1</sup>, R. Ichikawa<sup>1</sup>, M. Mori<sup>1</sup> and M. Kimura<sup>1</sup>  
<sup>1</sup> *Ryukoku Univ., JAPAN*

**Closing Remarks** (15 : 30~15 : 40)



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