

Technical Program

Opening Remarks

Thursday, February 28th, 2019 @ 2F Hall (10:00 – 10:20)

Keynote

Thursday, February 28th, 2019 @ 2F Hall (10:20 – 11:40)

[KN1]

Current and Future Prospect on Display Glass Substrate

Taketsugu Itoh
Itoh Device Consulting, Saitama, Japan

[KN2]

Printed OLED Display and its Backplane Technology

Toshiaki Arai
Strategic Technology Planning Department, JOLED Inc., Kanagawa, Japan

Symposium 温故拓新

- Renaissance and Future Progress for TFT -

Thursday, February 28th, 2019 @ 2F Hall (13:30 – 15:45)

[S0]

Introductory Talk

Takashi Noguchi¹ and Mamoru Furuta²

¹University of the Ryukyus, Japan ²Kochi University of Technology, Japan

[S1]

Novel Low-Temperature Crystallization and High-Performance Si TFT

Naoto Matsuo and Akira Heya

Dept. of Materials and Synchrotron Radiation Engineering, University of Hyogo, Himeji, Japan

[S2]

Oxide Semiconductor TFTs:

half a century incubation, rapid commercialization after revival, and the future

Hideya Kumomi, Toshio Kamiya, and Hideo Hosono

Tokyo Institute of Technology, Yokohama, Japan

[S3]

Flexible sensors: a great opportunity for thin film transistor technology

Guglielmo Fortunato, Luca Maiolo, Francesco Maita, Luigi Mariucci, Alessandro Pecora, Matteo Rapisarda

IMM-CNR, Rome, Italy

[S4]

TFT Technology for Foldable and Rollable Electronics

Suhui Lee and Jin Jan

Advanced Display Research Center (ADRC), Department of Information Display, Kyung Hee University, Seoul, Korea

[S5]

Oxide TFTs for Large-Sized OLED TV

Chanki Ha¹, Won Beom Yoo¹, Ji Yong Noh², Woo Cheol Jeong¹, Jong Uk Bae¹, Jong Woo Kim¹

¹OLED Panel Development, LG Display, Paju, South Korea ²LGD Laboratory, LG Display, Paju, South Korea

Session 2H

Oxide TFTs-I

Friday, March 1st, 2019 @ 2F Hall (9:30 – 10:35)

[2H1-inv]

A practical strategy for high-performance AOS-TFTs with high-stability

Junghwan Kim¹, Yu-Shien Shiah¹, Joonho Bang¹, Katsumi Abe², Hideo Hosono¹

¹Materials Research Center for Element Strategy, Tokyo Institute of Technology, Yokohama, Japan

²Silvaco Japan Co., Ltd., Kyoto, Japan

[2H2]

The local degradation by hot electron injection in oxide semiconductor thin-film transistor

Hyeon-Jun Lee^{1*}, Katsumi Abe², Sung Haeng Cho³, and Myoung-Jae Lee¹

¹Institute of Convergence, DGIST, Daegu, South Korea ²Silvaco Japan Company, Ltd., Yokohama, Japan ³Realistic Display Research Group, ETRI, Daejeon, South Korea

[2H3]

Small-signal measurement of the threshold voltage shift in thin film transistors under positive gate bias

Tianwei Zhang, Kham Niang, Andrew John Flewitt

Engineering Department, University of Cambridge

[2H4]

Stability improvement of electric double layer transistor by suppressing chemical reaction

Yang Liu^{1*}, Mami N. Fujii¹, Juan Paolo S. Bermundo¹, Yasuaki Ishikawa¹, Miwa Kazumoto², Shimpei Ono², Yukiharu Uraoka¹

¹Nara institute of science and technology, Japan ²Central Research Institute of Electric Power Industry, Japan

Session 2A

Organic TFTs

Friday, March 1st, 2019 @ 4F RoomA (9:30 – 10:40)

[2A1-inv]

High drain voltage induced instability in short channel staggered OTFTs

Luigi Mariucci¹, M.Rapisarda¹, Antonio Valletta¹, G. Fortunato¹ and G. Giusi²

¹CNR-IMM, Roma, Italy ²Dept. of Engineering, University of Messina, Messina, Italy

[2A2-inv]

A Deeper Understanding of Charge Transport in Thin-Film Transistors

Ananth Dodabalapur and Xiao Wang

Dept. of Electrical and Computer Engineering, The University of Texas at Austin, USA

[2A3]

Organic Synaptic Devices with Floating-Gate Transistor Structure

Ya-Nan Zhong, Xu Gao, Sui-Dong Wang

Institute of Functional Nano & Soft Materials (FUNSOM), Soochow University

[2A4]

Analysis of Organic Transistors with Disorder: Degenerate and Non-degenerate

Yongjeong Lee¹, Sungyeop Jung², Sungjune Jung^{2,3}, Gilles Horowitz¹ and Yvan Bonnassieux¹

¹LPICM, CNRS UMR 7647, Ecole polytechnique ²i-LAB, Pohang University of Science and Technology (POSTECH), ³Dept. of Creative IT Engineering, POSTECH

Session 3H

Crystallization and Si-related devices

Friday, March 1st, 2019 @ 2F Hall (11:00 – 12:15)

[3H1-inv]

Visualization of Temperature Field in Molten Silicon Formed by Thermal Plasma Jet Induced Ultra-rapid Annealing

Seiichiro Higashi^{1,2}, Yuri Mizukawa¹

¹Graduate School of Advanced Sciences of Matter, Hiroshima University, Hiroshima, Japan ²Research Institute for Nanodevice and Bio Systems, Hiroshima University, Hiroshima, Japan

[3H2-inv]

Metal Source/Drain Structure TFTs using poly-Si Crystallized by Blue Multi-Laser Diode Annealing

Tatsuya Okada and Takashi Noguchi

University of the Ryukyus, Japan

[3H3-inv]

Single grain Si stripe on glass substrate formed by μ CLBA and its application to single grain TFT

Wenchang Yeh, Mitsuki Hirasue, and Toshiki Shirakawa

Interdisciplinary Faculty of Science and Engineering, Shimane University, Matsue, Japan

[3H4]

PON Body Effect on Junctionless Thin-Film Transistor

William Cheng-Yu Ma, Hsiao-Chun Wang, Li-Wei Yu, Jia-Yi Wang, Yan-Jia Huang, Ming-Jhe Li, Shen-Ming Luo, Cai-Jia Tsai, and Jiun-Hung Lin

Department of Electrical Engineering, National Sun Yat-sen University

Session 3A

Printable & Flexible devices-I

Friday, March 1st, 2019 @ 4F RoomA (11:00 – 12:05)

[3A1-inv]

Polyimide Film for Flexible Display Substrate

Tetsuo Okuyama
Toyobo Co., Ltd. Research Center, Japan

[3A2]

Organic-Metal Oxide Hybrid Device for Advanced Functionality Development in Large Area Electronics

Myung-Gil Kim
Department of Chemistry, Chung-Ang University

[3A3]

Influence of thickness on the instantaneous semiconductor-to-conductor transformation of transparent a-IGZO at low temperatures

Juan Paolo S. Bermundo¹, Yasuaki Ishikawa¹, Mami N. Fujii¹, Hiroshi Ikenoue², and Yukiharu Uraoka¹
¹Nara Institute of Science and Technology, 8916-5 Takayama, Ikoma, Nara 630-0192, Japan ²Kyushu University, 744 Motoooka, Nishi-ku, Fukuoka, 819-0395, Japan.

[3A4]

Low temperature processed TFTs with Ar+O₂+H₂-sputtered IGZO channel and high- κ anodic-Al₂O₃ dielectric for flexible devices

S. G. Mehadi Aman^{1,*}, Ryūnosuke Higashi¹, Yuya Hirota¹, Yusaku Magari¹, Daichi Koretomo¹, Norbert Fruehauf³, and Mamoru Furuta^{1,2}
¹Environmental Science and Engineering, ²Center for Nanotechnology, Kochi University of Technology, 185 Miyanokuchi, Tosayamada, Kami, Kochi, 782-8502 ³Institute for Large Area Microelectronics, University of Stuttgart, 70569 Stuttgart, Germany

Student Session 1

Friday, March 1st, 2019 @ 2F Hall (14:00 – 15:12)

[ST1-1]

Low Temperature Processed Zirconium-Oxo Cluster Dielectric Material For The Semiconductor Thin-Film Transistors

Dojeon Kim, Myung-Gil Kim
Department of Chemistry, Chung-Ang University

[ST1-2]

Organic-Inorganic Hybrid Transparent Conductive Electrode for Flexible Electronics

Minh Nhut Le, Byung Doo Choi, Myung Gil Kim*
Department of Chemistry, Chung-Ang University, Seoul, 06974, Korea

[ST1-3]

Highly Reliable Solution Processed Amorphous In-Zn-O (a-IZO) Thin-Film Transistors via Low Temperature Photosensitive Solution Processed Passivation

Aimi Syairah¹, Juan Polo Bermundo¹, Naofumi Yoshida^{1,2}, Toshiaki Nonaka², Mami N. Fujii¹,
Yasuaki Ishikawa¹, Yukiharu Uraoka¹
¹Nara Institute of Science and Technology ²PM-Display Patterning Materials Research, Merck
Performance Materials Ltd.

[ST1-4]

Effect of Zinc Doping in Amorphous InWO Thin Film Transistors

Zhen-Hao Li¹, Sin-Yi Jiang¹, Po-Yi Kuo¹, Eric Sun², Shih-Tse Wu², Po-Tsun Liu¹
¹Dept. of photonics, University of National Chiao Tung, Hsinchu, Taiwan ²Applied Materials AKT
Display Inc., Taiwan, Taiwan

[ST1-5]

Effect of channel thickness on electrical performance of IGZO thin film transistor with heterogeneous channel

Shūhei Hamada^(1,*), Ryūnosuke Higashi¹, Daichi Koretomo¹, Mamoru Furuta^{1,2}

¹Environmental Science and Engineering, ²Center for Nanotechnology, Kochi University of Technology.

[ST1-6]

Simultaneous Fabrication of Thin Film Transistor and Switching Resistance Memory Using GTO Thin Film

Sumio Sugisaki¹, Ayata Kurasaki¹, Kenta Tanino¹, Ryo Tanaka¹, Tokiyoshi Matsuda² and Mutsumi Kimura^{1,2}

¹Dept of Electronics and Informatics, Ryukoku University, ²Joint Research Ceuner, Ryukoku University

Student Session 2

Friday, March 1st, 2019 @ 4F RoomA (14:00 – 15:12)

[ST2-1]

Crystallization of Si films sputtered by Ne or Xe gas on PC using ELA

Yuya Ishiki, Tatsuya Okada, Takashi Noguchi, Naoya Kawamoto
University of the Ryukyus

[ST2-2]

Lumped ELA with long pulse duration for Si film on panel

R. Nakatsura¹, Y. Ishiki¹, T. Okada¹ and T. Noguchi¹, T. Morimura², A. Ota², O. Nishikata², J. Kiyota²
¹Faculty of Engineering, University of the Ryukyus, ²ULVAC Inc.

[ST2-3]

Solution Based Aluminum Oxide Film for Thin Film Transistor

H. C. Yang¹, S. H. Hwang¹, Y. J. Baek¹, S. J. Gang¹, P. S. Song¹, T. Okada², T. Noguchi², B. S. Bae¹
¹Hoseo University, ²University of the Ryukyus

[ST2-4]

Batteryless Operation of Single Crystalline Silicon CMOS Logic Circuits on a Flexible Substrate by Perovskite Photovoltaic Cells

Satoshi Nagasawa, Hiroaki Hanafusa, Seiichiro Higashi
Graduate School of Advanced Sciences of Matter, Hiroshima University, Japan

[ST2-5]

Aligned Carbon nano-tube field effect transistor by one droplet treatment

Boik Park, Jongsu Jang, Hyeonggyu Kim, Jiseok Seo, Hyunjun Yoo and Yongtaek Hong
Dept. of Electrical and Computer Engineering, Seoul National University, Republic of Korea

[ST2-6]

Synthesis of CdTe Quantum Dot and Ligand Exchange with MCC for QD-TFT Application

Yeo Kyung Kang, Ju Mi Kim, Myung-Gil Kim
Department of Chemistry, Chung-Ang University

Session 4H

Printable & Flexible devices-II

Friday, March 1st, 2019 @ 2F Hall (15:30 – 16:50)

[4H1-inv]

High Performance Solution-Processable Organic Thin Film Transistors

Cheng-Liang Liu¹, Bo-Chin Chang¹, Guan-Yu He², Bo-Chin Chang¹, Chih-Yu Lin¹, Sureshraj
Vegiraju², Ming-Chou Chen²

¹Dept. of Chemical and Materials Engineering, National Central University, Taoyuan, Taiwan ²Dept.
of Chemistry, National Central University, Taoyuan, Taiwan

[4H2]

Development of Digital Circuit using Inkjet Printed N-type Organic Field Effect Transistors

Seung Jae Moon^{1,2}, Seong Min Park^{1,2}, Byung Seong Bae², Tayeb Mohammed-Brahim¹, Maxime
Harnois¹, and Emmanuel Jacques¹

¹Institut d'Electronique et des Telecommunications de Rennes, Universite Rennes 1, UMR CNRS
6164, Campus de Beaulieu, 35042 Rennes Cedex, France ²School of Electronics and Display
Engineering, Hoseo University, Asan, Chungnam 31499, Republic of Korea

[4H3]

Near-infrared printed organic photo-transistor based on PbS Quantum Dots

Zhi Tao^{1,2}, Tayeb Mohammed-Brahim² Wei Lei¹, Maxime Harnois², Emmanuel Jacques²

¹School of Electronic Science and Engineering, Southeast University, Nanjing 210096, People's
Republic of China ²Institut d'Electronique et de Telecommunication de Rennes, UMR CNRS 6164,
Universite de Rennes 1, Campus de Beaulieu, 35042 RENNES Cedex (France)

[4H4]

Ultrathin and robust gate dielectric on sputtered C nanoparticles for low-voltage organic thin-film transistors and inverters

Xu Gao, Jie Liu, Ya-Nan Zhong, Sui-Dong Wang

Institute of Functional Nano & Soft Materials (FUNSOM), Soochow University, P. R. China

[4H5]

Oxygen concentration dependence of transfer free graphene thin film transistor

K. Ichikawa¹, S. Tateishi¹ and H. Akamatsu²

¹National Institute of Technology, Matsue College, Shimane, Matsue city, Japan ²Kobe City College
of Technology, Hyogo, Kobe city, Japan

Session 4A

Novel application for TFTs

Friday, March 1st, 2019 @ 4F RoomA (15:30 – 16:50)

[4A1-inv]

Oxide-based Neuromorphic Transistors for Brain-like Computation

Qing Wan

School of Electronic Science and Engineering, and Collaborative Innovation Center of Advanced Microstructures, Nanjing University, Nanjing, China

[4A2]

Organic Diode Sensor with an Enhanced Operational Current and Lifetime for Monitoring Breath Ammonia in Hemodialysis Patients

Shang-Yu Yu^{1,2}, Tin-Wei Tung¹, Yu-Chih Lee³, Chang-Chiang Chen^{4,5*}, Hsiao-Wen Zan^{1*}, Hsin-Fei Meng^{3*}, and Olivier Soppera²

¹Department of Photonics, College of Electrical and Computer Engineering, ³Institute of Physics, and ⁴Department of Biological Science and Technology, National Chiao Tung University, 1001, Ta Hsueh Rd., 300 Hsinchu, Taiwan ²Université de Haute-Alsace, CNRS, IS2M UMR 7361, F-68100 Mulhouse, Université de Strasbourg, France ⁵Department of Internal Medicine, Division of Nephrology, National Taiwan University Hospital Hsin-Chu Branch, 25, Ln. 442, Sec. 1, Jingguo Rd., 300 Hsinchu, Taiwan

[4A3]

Field Effect Phototransistor for Up-conversion Device

Alagesan Subramanian, Qasim Khan and Wei Lei

¹Joint International Research Laboratory of Information Display and Visualization, School of Electronic Science and Engineering, Southeast University, Nanjing, Jiangsu 210096, China ²College of Electronic Science and Technology, Shenzhen University, Shenzhen 518000, China.

[4A4]

IGZO MESFETs with enzyme-modified Schottky gate for glucose sensing

J. Kaczmarek, J. Jankowska-Śliwińska, M. Borysiewicz, E. Kamińska

Institute of Electron Technology, Al. Lotnikow 32/46, 02-668 Warsaw, Poland

[4A5]

Investigation of the Sensing Mechanism of the Dual-gate Low-Voltage Organic Transistor based Pressure Sensor.

Ogunleye Olamikunle Osinimu, Heisuke Sakai, Yuya Ishii, Hideyuki Murata

¹School of Materials Science, Japan Advanced Institute of Science and Technology ²Faculty of Fiber Science and Engineering, Kyoto Institute of Science and Technology

Banquet

Friday, March 1st, 2019 @ Okinawaken-Seinenkaikan (18:00 – 20:30)

Session 5A

Thin-Film technologies and device physics

Saturday, March 2nd, 2019 @ 4F RoomA (9:00 – 9:55, 10:10 – 11:05)

[5A1-inv]

Thin Film Technology devices studied for education purpose

Olivier Bonnaud^{1,2}

¹IETR, University of Rennes 1, Rennes, France ²GIP-CNFM, Grenoble, France

[5A2-inv]

Turn-off mechanisms in thin-film source-gated transistors with applications to power devices and rectification

Eva Bestelink, Thoran Landers, Radu A Sporea

Advanced Technology Institute, University of Surrey, Guildford, United Kingdom

[5A3]

High Performance Multilayer MoS₂ Transistor through Interface Engineering

Jianfeng Jiang^{1,2}, Xianjin Feng¹, Yu Zhang^{1*}, Lin Han^{1,2*}

¹Center of Nanoelectronics and School of Microelectronics, Shandong University, Jinan 250100, China ²Institute of Marine Science and Technology, Shandong University, Qingdao 266200, China

[5A4-inv]

Physical but simple and robust OTFT spice model for circuit design

Yvan Bonnassieux

LPICM, Ecole Polytechnique Palaiseau, Paris, France

[5A5-inv]

Engineering Organic Field Effect Transistors for Bio-chemical Sensing

Xiaojun Guo

Dept. of Electronic Engineering, Shanghai Jiao Tong University, Shanghai, China

[5A6]

Experimental and Modeling of OTFTs

Emmanuel Jacques¹, Zhi Tao^{1,2}, Lei Wei², Tayeb Mohammed-Brahim¹

¹IETR, University of Rennes 1, Rennes, France ²School of Electronic Science and Engineering, Southeast University, Nanjing, China

Session 5B

Oxide TFTs-II

Saturday, March 2nd, 2019 @ 4F RoomB (9:00 – 9:50, 10:10 – 10:45)

[5B1-inv]

Low temperature (150°C) processed high mobility oxide TFTs for stretchable AMOLED

Munpyo Hong
Korea University, Korea

[5B2]

Low voltage high performance ZnO thin film transistor processed by Spray Pyrolysis

Jewel Kumer Saha^{1,2}, Ravindra Naik Bukke¹, Narendra Naik Mude¹, Christophe Avis¹, and Jin Jang^{1*}
¹Advanced Display Research Center, Kyung Hee University, Dongdaemoon-ku, Seoul 02447, South Korea. ²Department of Physics, Jagannath University, Dhaka 1100, Bangladesh,

[5B3]

High Performance of Solution Processed Indium Tin Oxide Thin Film Transistor by Gallium Incorporation

Narendra Naik Mude, Ravindra Naik Bukke, Jewel Kumer Saha, Christophe Avis, and Jin Jang*
Advanced Display Research Center, Kyung Hee University, Dongdaemoon-ku, Seoul 02447, South Korea

[5B4-inv]

Towards ideal thin-film transistors based on oxide or organic semiconductors

Chuan Liu
School of Electronics and Information Technology, Sun Yat-sen University, Guangzhou, China

[5B5]

Impact of Negative Capacitance on P-Type Tin-Oxide Thin Film Transistor

Chien Liu¹, Hung-Chung Lin², Hsiao-Hsuan Hsu³, Chia-Chi Fan⁴, Wu-Ching Chou¹, Chien-Liang Lin³, Yu-Chi Fan³, Tsung-Ming Lee³, Shih-An Wang², Jun Ma⁵, Zhi-Wei Zheng⁵, Huang Zi You² and Chun-Hu Cheng^{2,*}

¹Dept. of Electro-physics, National Chiao Tung University, Taiwan ²Dept. of Mechatronic Engineering, National Taiwan Normal University, Taiwan ³Dept. of Materials & Mineral Resources Engineering, National Taipei University of Technology, Taiwan ⁴Dept. of Electronics Engineering, National Chiao Tung University, Taiwan ⁵Dep. of Electronics Engineering, Xiamen University, China

Closing Remarks

Saturday, March 2nd, 2019 @ 4F RoomA (11:10 –)