

***Preliminary Program***  
(March 21, 2023)

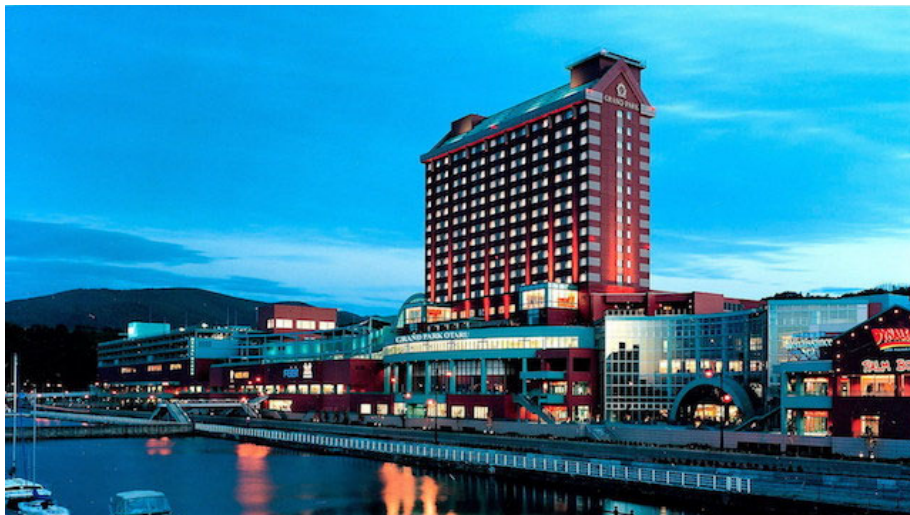
2023 International Conference on  
Semiconductor Technology for Ultra Large  
Scale Integrated Circuits and Thin Film  
Transistors (ULSIC VS TFT 8)

May 14-18, 2023

Grand Park Hotel  
Otaru (Sapporo), Japan

**Conference Chairs**

**Yue Kuo**  
Texas A&M University, USA



**Engineering Conferences International**  
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**Sunday, May 14, 2023**

17:30 – 19:00	Conference Check-in
19:00 – 20:30	Welcome Reception and Dinner (Ryusei Room)
20:30 – 21:30	Free communication

**Locations and Notes**

- Technical Sessions will be in Jukai room

**Monday, May 15, 2023**

- 06:30 – 08:00           **Breakfast** (Terrace Brasserie Restaurant)
- 08:00 – 08:05           **Open remark**  
Yue Kuo, Texas A&M University
- Session: General Topics**  
Chair: Yue Kuo, Texas A&M University
- 08:05 – 08:30           **Invited**  
**Challenge to next-generation VLSI with VFET using oxide semiconductor and 3D structure**  
Shunpei Yamazaki, Semiconductor Energy Laboratory Co., Ltd
- 08:30 – 08:55           **Invited**  
**ULSI and TFT technologies joint forces to meet the future challenges of a pervasive digital society**  
Olivier Bonnaud, University of Rennes
- Session: Semiconductor Materials**  
Chairs: Kenji Nomura, University of California San Diego  
          Laurie E. Calvet, LPICM, CNRS-Ecole Polytechnique  
          Shinji, Migita, AIST
- 08:55 – 09:20           **Invited**  
**Atomic-order surface reaction of reactant gas on group IV semiconductor (100) surface**  
Junichi Murota, Tohoku University
- 09:20 – 09:45           **Invited**  
**Formation and luminescence studies of Ge/Si core-shell quantum dots**  
Seiichi Miyazaki, Katsunori Makihara, Yuki Imai, Nagoya University
- 09:45 – 10:10           **Invited**  
**Epitaxy and heterostructure of germanium tin-related group-IV alloy semiconductors for future electronic and optoelectronic applications**  
Osamu Nakatsuka, Masashi Kurosawa, Shigehisa Shibayama, Mitsuo Sakashita, Nagoya University
- 10:10 – 10:40           Coffee Break
- 10:40 – 11:00           **Crystallinity of In-Ga-Zn-oxide (IGZO) in CAAC-IGZO vertical FET**  
Tomonori Nakayama, Yukinori Shima, Toshikazu Ono, Nao Sorida, Naoki Okuno, Hitoshi Kunitake, Shunpei Yamazaki, Semiconductor Energy Laboratory Co., Ltd.

**Monday, May 15, 2023 (continued)**

- 11:00 – 11:20      **Spinel, an overlooked crystalline phase of Igzo**  
Hendrik F.W. Dekkers, Akhilesh Kumar Mandal, Evangelos Aggiannis, Adrian Vaisman, Chasin Romain Delhougne, Attilio Belmonte, Gouri Sankar Kar, Interuniversity Microelectronics Centre (imec)
- Session: P-channel Oxide Materials for TFTs**  
Chair: Olivier Bonnaud, University of Rennes
- 11:20 – 11:45      **Invited**  
**Progress of p-channel oxide-TFT development and how we improve the performances**  
Kenji Nomura, University of California San Diego
- 11:45 – 12:10      **Invited**  
**P-channel metal oxide thin film transistors for flexible CMOS logic: Challenges and opportunities**  
Andrew Flewitt, Kham Niang, Daisy Gomersall, Jake Meeth, Niels van Fraassen, Sanggil Han, University of Cambridge; James Parish, Andrew Johnson, University of Bath
- 12:10 – 12:35      **Invited**  
**Developing high-performance p-channel TFTs: From emerging semiconductors to amorphous**  
Ao Liu, Huihui Zhu, Northwestern University; Yong-Young Noh, POSTECH
- 12:35 – 14:00      Lunch (Ryusei Room)
- Session: Dielectrics**  
Chairs: Cheol Seong Hwang, Seoul National University  
                         Junichi Murota, Tohoku University
- 14:00 – 14:25      **Invited**  
**What can we do with ferroelectric gate?**  
Eisuke Tokumitsu, Japan Advanced Institute of Science and Technology
- 14:25 – 14:50      **Invited**  
**Material challenges in HfO<sub>2</sub>-based ferroelectric memory devices**  
Min Hyuk Park, Seoul National University
- 14:50 – 15:15      **Invited**  
**Ferroelectric phase transformation accelerated in nanolaminate HfO<sub>2</sub>-ZrO<sub>2</sub> thin films**  
Shinji Migita, The National Institute of Advanced Industrial Science and Technology (AIST)
- 15:15 – 15:45      Coffee Break
- 15:45 – 16:10      **Invited**  
**Development of high-performance halide perovskite transistors**  
Yong-Young Noh, POSTECH

**Monday, May 15, 2023 (continued)**

- 16:10 – 16:35      **Invited**  
**Ternary amorphous oxide semiconductor material toward 3D-integrated ferroelectric devices**  
Takanori Takahashi, Mutsunori Uenuma, Nara Institute of Science and Technology; Masaharu Kobayashi, University of Tokyo; Yukiharu Uraoka, Nara Institute of Science and Technology
- 16:35 – 17:00      **Invited**  
**Microfabrication of BiTeSb thermoelectric devices for applications to IoT sensors**  
Takahito Ono, Nguyen Van Toan, Trung Thi Kim Tuoi, Tohoku University
- 17:00 – 18:30      Free Communication
- 18:30 – 20:30      Dinner (Ryusei Room)
- 20:30 – 21:30      Panel Discussion: Challenges in TFT Materials

**Tuesday, May 16, 2023**

- 06:30 – 08:00      **Breakfast** (Terrace Brasserie Restaurant)
- Session: Devices and Circuits I**  
                         Chairs: Shunpei Yamazaki, Semiconductor Energy Laboratory  
                         I-Chun Cheng, National Taiwan University  
                         Peter Mascher, McMaster University
- 08:00 – 08:25      **Invited**  
**HfZrO-based ferroelectric capacitors and FETs for ultralow-power signal processing**  
Shinichi Takagi, Kasidit Toprasertpong, Eishin Nako, Xuan Luo, Mitsuru Takenaka, Ryosho Nakane, The University of Tokyo
- 08:25 – 08:50      **Invited**  
**Contact effects towards mainstream thin-film transistor applications**  
Radu A. Sporea, University of Surrey
- 08:50 – 09:15      **Invited**  
**Latch-up issue between high-voltage circuit domain and low-voltage circuit domain in TFT LCD driver IC fabricated with BCD process**  
Ming-Dou Ker, Zi-Hong Jiang, National Yang Ming Chiao Tung University
- 09:15 – 09:35      **Invited**  
**Spiking neuron circuits in ULSIC vs TFT technologies**  
Laurie E. Calvet, LPICM, CNRS-Ecole Polytechnique; Zonglong Li, Centre de Nanosciences et Nanotechnologies; Benjamin Iniguez, University Rovira i Virgili; Kruno Romanjek, CEA-LITEN
- 09:35 – 10:00      **Electric field thermopower modulation analysis of oxide thin film transistors**  
Prashant Ghediya, Hui Yang, Hokkaido University; Yuqiao Zhan, Jiangsu University; Yasutaka Matsuo, Yusaku Magari, Hiromichi Ohta, Hokkaido University
- 10:00 – 10:30      Coffee Break
- 10:30 – 10:55      **Invited**  
**Sub 10-nm ferroelectric gadolinium-doped HfO<sub>2</sub> capacitors for non-volatile FeRAM**  
Ahmad Bsiesy, Liliane Alrifai, Evgenii Skopin, Patrice Gonon, Université Grenoble Alpes
- 10:55 – 11:20      **Invited**  
**TFT circuits for driving sensors and actuators on flat panels**  
Florian De Roose, Nikolas Papadopoulos, Raf Appeltans, Paul Heremans, Interuniversity Microelectronics Centre (imec)
- 11:20 – 11:45      **Invited**  
**CMOS inverters and circuits based on oxide thin-film transistors**  
I-Chun Cheng, Shu-Ming Hsu, Yun-Shiuan Li, Wei-Chen Li, Feng-Yu Tsai, Jian-Zhang Chen, National Taiwan University

**Tuesday, May 16, 2023 (continued)**

- 11:45 – 12:10      **Device layout dependence of PBTI in back-gated IGZO TFTs**  
Pietro Rinaudo, Adrian Chasin, Jacopo Franco, Ben Kaczer, Ingrid de Wolf, Gouri Kar, imec and Katholieke Universiteit Leuven
- 12:10 – 13:10      Lunch (Ryusei Room)
- Session: Devices and Circuits II**  
Chairs: Ahmad Bsiesy, Université GrenobleAlpes  
                         Radu A. Sporea, University of Surrey  
                         Po-Tsun Liu, National Yang Ming Chiao Tung University
- 13:10 – 13:35      **Invited**  
**Vertical channel-all-around IGZO FET for low latency, high-density 2T0C 3D DRAM application**  
Di Geng, Chuanke Chen, Xinlv Duan, Ling Li, Institute of Microelectronics of the Chinese Academy of Sciences
- 13:35 – 14:00      **Invited**  
**Circuit architecture and pixel array driving methods for AMOLED and Mini/Micro-LED displays**  
Chih-Lung Lin, National Cheng Kung University
- 14:00 – 14:20      **Strategy for threshold voltage reduction of molybdenum disulfide (MoS<sub>2</sub>)-based field effect transistor by substitutional tungsten doping**  
Hwi Yoon, Inkyu Sohn, Yonsei University; Yunyong Nam, Jun Hyung Lim, Samsung Display Co., Ltd.; Seung-min Chung, Hyungjun Kim, Yonsei University
- 14:20 – 14:40      **Threshold voltage reduction of MoS<sub>2</sub>-based thin film transistor by H<sub>2</sub>O-added chemical vapor deposition**  
Jisang Yoo, Hwi Yoon, Jaehyeok Kim, Yonsei University; Yunyong Nam, Jun Hyung Lim, Samsung Display Co., Ltd.; Seung-min Chung, Jaehyeok. Hyungjun Kim, Yonsei University
- 14:40 – 15:10      Coffee Break
- 15:10 – 15:35      **Invited**  
**An atomistic understanding of the oxygen vacancies in Pt/TiO<sub>2</sub>/Ti resistive random access memory: *Ab initio* study**  
Jung-Hae Choi, Taeyoung Jeong, Korea Institute of Science and Technology; Cheol Seong Hwang, Seoul National University
- 15:35 – 16:00      **Invited**  
**Characteristics of oxide TFT using atomic-layer deposited InO<sub>x</sub>-based metal oxide channel**  
Toshihide Nabatame, Riku Kobayashi, Kazuhito Tsukagoshi, National Institute for Materials Science
- 16:00 – 16:20      **Tri-layer self-aligned structure indium gallium zinc oxide thin film transistor with optical synaptic plasticity**  
Tsung-Che Chiang, Zhen-Hao Li, Jing-Zhong Deng, Po-Tsun Liu, National Yang Ming Chiao Tung University; Yue Kuo, Texas A&M University

**Tuesday, May 16, 2023 (continued)**

- 16:20 – 16:45            **Invited**  
**Ultrathin organic transistors toward next-generation skin electronics**  
Sunghoon Lee, Tomoyuki Yokota, Takao Someya, The University of Tokyo
- 16:45 – 17:05            **GAP-type low-temperature polycrystalline silicon thin film transistors for light sensing photo-transistor application**  
Jo-Lin Chen, Tsung-Che Chiang, Zhen-Hao Li, Yu-Ting Tsai, Po-Tsun Liu, National Yang Ming Chiao Tung University; Yue Kuo, Texas A&M University
- 17:05 – 17:30            **Invited**  
**ALD of robust amorphous oxide TFTS with turn on at the Boltzmann limit**  
Rebecca L. Peterson, Christopher R. Allemang, Tonglin L. Newsom, Tae H. Cho, Neil P. Dasgupta, University of Michigan
- 17:30 – 18:00            Free Communication
- 18:00 – 20:00            Dinner (Ryusei Room)
- 20:00 – 21:30            **Poster session (remove poster at 21:30)**





**Wednesday, May 17, 2023 (continued)**

- 11:15 – 11:40      **Invited**  
**An overview of the three-dimensionally stacked dynamic random access memory**  
Cheol Seong Hwang, Seoul National University
- 11:40 – 12:00      **Solid-state electrochemical thermal transistors**  
Hiromichi Ohta, Qian Yang, Hai Jun Cho, Zhiping Bian, Mitsuki Yoshimura, Hokkaido University; Joonhyuk Lee, Hyoungjeen Jeon, Pusan National University; Jinghuang Lin, Jiake Wei, Bin Feng, Yuichi Ikuhara, Hokkaido University
- 12:00 – 12:20      **Super stretchable polymer-metal hybrid electrodes fabricated by co-sputtering for high-performance stretchable electronics and sensors**  
Han-Ki Kim, SungKyunKwan University
- 12:20 – 13:20      Lunch (Ryusei Room)
- 13:20 – 18:30      Optional Excursion
- 18:30 – 21:00      **Banquet and Poster Award Announcement** (Ryusei Room)
- 21:00 – 22:00      Panel Discussion: Challenges in TFT Materials

**Thursday, May 18, 2023**

- 06:30 – 08:00           **Breakfast** (Terrace Brasserie Restaurant)
- Session: Novel TFT Applications**  
                                  Chairs: Yukiharu Uraoka, NAIST  
                                                Xiaojun Guo, Shanghai Jiao Tong University  
                                                Florian De Roose, imec
- 08:00 – 08:25           **Invited**  
                                  **Poly-oxide Tft for flexible electronics**  
                                  Jin Jang, Kyung Hee University
- 08:25 – 08:50           **Invited**  
                                  **TFT-based active sensors and sensor interfaces**  
                                  Kai Wang, Sun Yat-sen University
- 08:50 – 09:15           **Invited**  
                                  **Temporal information processing for in-sensor computing based on amorphous IGZO phototransistor**  
                                  Jen-Sue Chen, Ching-Hsiang Yang, Li-Chung Shih, National Cheng Kung University
- 09:15 – 09:40           **Metal-oxide thin-film transistor: An enabling technology for smart sensor construction and 3-D monolithic integration**  
                                  Zhihe Xia, Yushen Hu, Tengting Lei, Man Wong, The Hong Kong University of Science and Technology
- 09:40 – 10:10           Coffee Break
- 10:10 – 10:35           **Invited**  
                                  **Organic electrochemical transistors for sensing applications**  
                                  Feng Yan, The Hong Kong Polytechnic University
- 10:35 – 10:55           **Self-adhesive organic thin film transistors on elastomeric nanofilms**  
                                  Chika Okuda, Sunghoon Lee, Takao Someya, Tomoyuki Yokota, The University of Tokyo
- 10:55 – 11:20           **Invited**  
                                  **Droplets driving and sensing pixel circuits for thin film transistor-based digital microfluidics**  
                                  Dongping Wang, Chunyu Chang, Chinese Academy of Sciences; Yingbo Wei, Jun Yu, Arokia Nathan, Shandong University; Hanbin Ma, Chinese Academy of Sciences
- 11:20 – 11:45           **Invited**  
                                  **Mesoporous titania based synaptic device characteristics**  
                                  Hyun Ho Lee, Myongji University
- 11:45 – 11:50           End of Meeting Remark
- 11:50                      Lunch (Ryusei Room)

## Poster Presentations

- 1. New approach for bottom-up synthesis of 2D MoS<sub>2</sub> and patterning using electrohydrodynamic jet printer for thin-film transistors**  
Young-Jin Kwack, Thi Thu Thuy Can, Woon-Seop Choi, Hoseo University
- 2. Extract coefficients of thermal expansion of TaN thin film by tuning the N<sub>2</sub> gas flow in the PVD process**  
Yao-Zih Lai, Weileun Fang, National Tsing Hua University
- 3. Highly sensitive broadband phototransistors based on gradient tin/lead mixed thin film perovskites**  
Hok-Leung Loi, Feng Yan, The Hong Kong Polytechnic University
- 4. Ultra-sensitive and portable organic electrochemical transistors for noninvasive saliva glucose monitoring**  
Zeyu Zhao, Feng Yan, The Hong Kong Polytechnic University
- 5. Flexible Ion-selective biosensors for sweat analysis**  
Zhiyuan Tian, Feng Yan, The Hong Kong Polytechnic University
- 6. Vertical oxide semiconductor field-effect transistor with extremely low off-state current**  
Takeya Hirose, Tomonori Nakayama, Masataka Nakada, Manabu Sato, Tomoaki Atsumi, Masahiro Takahashi, Satoru Saito, Hitoshi Kunitake, Hideaki Shishido, Takanori Matsuzaki, Shunpei Yamazaki, Semiconductor Energy Laboratory Co., Ltd.
- 7. Analysis of carrier injection under high temperature AC operation in top gate IGZO TFTs**  
Kuan-Ju Zhou, Ting-Chang Chang, National Sun Yat-Sen University. Po-Hsun Chen, Military Academy. Bo-Shen Huang, National Sun Yat-Sen University. Simon M. Sze, National Yang Ming Chiao Tung University
- 8. Clean dry etching of Cu and Ni alloy metal thin film by reactive proton assisted etching**  
MunPyo Hong, Donghoon Kim, Sangheon Lee, Minyoung Kim, Sungyoun Lee, Jin Nyoung Jang, Jong Hwa Lee, Chiwoo Kim, Sang-Gab Kim, Korea University
- 9. Room temperature gas sensing with a hybrid poly-Si/ZnO TFT cell**  
Horng-Chih Lin, Jen-Chi Liao, Ping-Che Liu, Pei-Wen Li, National Yang Ming Chiao Tung University
- 10. Donor activation in boron and phosphorus implanted self-aligned bottom-gate Igzo Tfts**  
Eli Powell, Muhammad Kabir, Rahnuma Chowdhury, Karl Hirschman, Rochester Institute of Technology. Robert Manley, Bin Zhu, Corning Incorporated
- 11. Ambipolar oxide thin-film transistor-based artificial synapses**  
Chihsin Huang, Kenji Nomura, University of California San Diego
- 12. Hafnium oxide-based ferroelectric thin-film transistor with a-InGaZnO channel fabricated at temperatures <= 350°C**  
Che-Chuan Lee, Chun-Wei Chang, Min-Hung Lee, I-Chun Cheng, National Taiwan University

13. **P-type tin monoxide thin-film transistors on cellulose nanopaper substrates**  
You-Hong Zhang, Pu-Yuan Lin, Feng-Cheng Chang, I-Chun Cheng, National Taiwan University
14. **Electrical performance of amorphous IGZO thin-film transistor on cellulose nanopaper substrate**  
Zi-Fan Cao, Chih-Han Tseng, Feng-Cheng Chang, I-Chun Cheng, National Taiwan University
15. **Optimization of transparent PTFE/oxide multilayered antireflective coating**  
Ye-Ju Lim, Jung-Min Park, Han-Ki Kim, SungKyunKwan University
16. **Deposition angle effect of Ga, Ti co-doped In<sub>2</sub>O<sub>3</sub> top cathodes in semi-transparent perovskite solar cells**  
Jin-Won Yang, Seo-Yun Choi, Hyeon Uk Ha, Ji-Young Heo, Dong-Won Kang, Saemon Yoon, Han-Ki Kim, Sungkyunkwan Universty
17. **High-quality ITO electrode on quartz substrate for ultra-large scaled integrated circuits and thin film transistors**  
Seo-Yun Choi, Ji-Young Heo, Jin-Won Yang, Hae-Jun Seok, SungKyunKwan University; JuYoung Jang, JeongWoo Ha, SEMES; Han-Ki Kim, SungKyunKwan University
18. **High-quality Sn-doped In<sub>2</sub>O<sub>3</sub> top cathodes for semi-transparent perovskite solar cells prepared by using isolated plasma soft deposition at room temperature**  
Jung-Min Park, Ji-Young Heo, Ye-Ju Lim, Han-Ki Kim, Sungkyunkwan University
19. **Metal–semiconductor transition of hydrogen-doped In<sub>2</sub>O<sub>3</sub> for thin-film transistor application**  
Xiaoqian Wang, Mamoru Furuta, Kochi University of Technology