

*Program*

**International Conference on  
Semiconductor technology for ultra large scale  
integrated circuits and thin film transistors**

**July 7 - 12, 2013  
Villard-de-Lans (Grenoble area), France**

*Conference Chair*

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

*Conference Co-Chairs*

**Gennadi Bersuker  
Sematech, USA**

**Cor Claeys  
IMEC, Belgium**



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**Sunday, July 7, 2013**

17:00 - 18:30	Conference check-in
18:30 - 19:30	Welcome reception
19:30 - 21:00	Dinner

***NOTES***

- Audiotaping, videotaping and photography of presentations are strictly prohibited.
- Please do not smoke at any conference functions.
- Turn your mobile phones to vibrate or off during technical sessions.
- Technical Sessions will be in the Village Conference Center.
- Meals and poster sessions/social hours will be in the hotel.
- Be sure to check your contact information on the Participant List in this program and make any corrections to your name/contact information online. A corrected copy will be sent to all participants after the conference.
- Speakers – Please leave at least 5 minutes for questions and discussion. Be available for discussion during meals and social periods

## **Monday, July 8, 2013**

07:00 - 08:30 Breakfast

08:45 - 08:55 Welcome and Introduction to the conference  
Yue Kuo, Conference Chair  
Norman Li, ECI Conference Liaison

### **Session 1: Plenary**

Session Chair: Yue Kuo, Texas A&M University, USA

08:55 - 09:35 **The future of heterogeneous and diversified ULSI nanoelectronics**  
Simon Deleonibus, CEA-LETI, France

09:35 - 10:15 **Post-SI CMOS technologies based on high-mobility channels**  
Tso-Ping Ma, Yale University, USA

10:15 - 10:45 Coffee break

### **Session 2: Future devices**

Session Chairs: Gennadi Bersuker, Sematech, USA  
Jin Jang, Kyung Hee University, Korea

10:45 - 11:15 **Status and trends in GE CMOS technology**  
Cor Claeys, Imec, Belgium

11:15 - 11:45 **A possibility of application of crystalline indium-gallium-zinc-oxide to very large scale integration**  
Shunpei Yamazaki, Semiconductor Energy Laboratory Co., Ltd., Japan

11:45 - 12:15 **Printed organic TFTs on flexible substrate for CMOS circuits**  
Micael Charbonneau, CEA Liten-17, France

12:30 - 13:30 Lunch

13:45 - 14:15 **Monolayer diamond FETs consist of fluorinated graphene channel**  
Mutsuko Hatano, Tokyo Institute of Technology, Japan

14:15 - 14:35 **Comparison of organic pulse-generator circuits for ferroelectric memories fabricated by all-additive printing**  
David E. Schwartz, PARC, USA

14:45 - 19:30 *Ad hoc* sessions / free time for discussions

19:30 - 20:00 Dinner

20:00 - 21:30 **Poster Session** and social hour

## Tuesday, July 9, 2013

07:00 - 08:30

Breakfast

### Session 3: 3D and new devices

Session Chairs: Junichi Murota, Tohoku University, Japan  
Arokia Nathan, Cambridge University, United Kingdom

08:45 - 09:15

#### **Crystalline nanowires for 3D VLSI applications**

Thomas Ernst, CEA-LETI, France

09:15 - 09:45

#### **Silicon on thin buried oxide (SOTB) technology for ultralow-power (ULP) applications**

Nobuyuki Sugii, Low-power Electronics Association & Project, Japan

09:45 - 10:15

#### **Towards higher integration thin film technology by involving P-type and N-type vertical channel thin film transistor**

Olivier Bonnaud, IETR University of Rennes, France

10:15 - 10:45

Coffee break

10:45 - 11:15

#### **Innovative sharp switching devices**

Sorin Cristoloveanu, IMEP, France

11:15 - 11:45

#### **Technology and design challenges in sub 30 nm DRAM**

Ewoud Vreugdenhil, ASML Netherlands B.V., The Netherlands

### Session 4: Oxide TFTs

Session Chairs: Cor Claeys, IMEC, Belgium  
Guglielmo Fortunato, CNR-IMM, Italy

11:45 - 12:15

#### **Novel integration process for IGZO MO-TFT fabrication on gen 8.5 PECVD and PVD systems - A quest to improve TFT stability and mobility**

Beom Soo Park, AKT, USA

12:15 - 12:45

#### **Roles of hydrogen in amorphous oxide semiconductor**

Toshio Kamiya, Tokyo Institute of Technology, Japan

13:00 - 14:00

Lunch

14:15 - 14:45

#### **Effect of electron density in channel on TFT performances in Dual Gate Oxide TFTs**

Jin Jang, Kyung Hee University, Korea

14:45 - 15:05

#### **Conduction Band Lowering Effect in Crystalline Indium-Gallium-Zinc-Oxide Thin Film Transistors**

Daisuke Matsubayashi, Semiconductor Energy Laboratory Co., LTD., Japan

15:05 - 15:25

#### **Trap densities in ZnO TFTs with SiN<sub>x</sub>/SiO<sub>2</sub> stacked gate insulators fabricated using several N<sub>2</sub>O flow rate during SiO<sub>x</sub> deposition**

Mutsumi Kimura, Ryukoku University, Japan

15:25 - 15:50

Coffee break

15:50 - 16:20

#### **Amorphous semiconductor oxide TFTs and applications**

Arokia Nathan, University of Cambridge, United Kingdom



**Tuesday, July 9, 2013 (continued)**

- |               |   |
|---------------|---|
| 16:20 - 16:50 | <b>Negative-bias with illumination stress induced state creation in amorphous IGZO thin-film transistor</b><br>Mamoru Furuta, Kochi University of Technology, Japan |
| 16:50 - 19:30 | <i>Ad hoc</i> sessions / free time for discussions  |
| 19:30 - 21:00 | Dinner  |
| 21:00 - 22:30 | Panel: Challenges in Materials & Fabrication followed by social hour/discussions  |

## **Wednesday, July 10, 2013**

07:00 - 08:30 Breakfast

### **Session 5: Gate dielectric and processes**

Session Chairs: Shunpei Yamazaki, Semiconductor Energy Laboratory Co., Ltd., Japan  
John Rowlands, Thunder Bay Regional Research Institute, Canada

08:45 - 09:15 **Gate dielectrics in CMOS and TFTs**  
John Robertson, Cambridge University, United Kingdom

09:15 - 09:45 **Defect generation caused by charge transfer in nano-layer oxides**  
Gennadi Bersuker, SEMATECH, USA

09:45 - 10:15 **Structure and electronic properties of polycrystalline dielectrics**  
Keith McKenna, University of York, United Kingdom

10:15 - 10:45 **Monolithic integration of oxides on semiconductors**  
Alex Demkov, University of Texas, USA

10:45 - 11:15 Coffee break

### **Session 6: Other TFTs**

Session chairs: Tso-Ping Ma, Yale University, USA  
Shinichi Takagi, The University of Tokyo, Japan

11:15 - 11:45 **Contact effects in organic and inorganic thin film transistors**  
Guglielmo Fortunato, IMM-CNR, Italy

11:45 - 12:15 **Flexible single-grain Si TFTs on a plastic substrate**  
Ryoichi Ishihara, Delft University of Technology, The Netherlands

12:15 - 12:35 **Characterization of undoped/doped zinc oxide films by sol gel method on different substrates**  
Sonik Bhatia, Kanya Maha Vidyalaya, Jalandhar, India

13:00 - 14:00 Lunch

14:00 - 20:00 Excursion / free time for discussions

20:00 - 21:30 Dinner

21:30 - 22:30 Panel: Challenge in Applications followed by social hour and discussion

**Thursday, July 11, 2013**

07:00 - 08:30 Breakfast

**Session 7: LEDs & Group IV Materials and Devices**

Session Chairs: Olivier Bonnaud, University of Rennes 1, France  
Nobuyuki Sugii, The University of Tokyo, Japan

08:45 - 09:15 **Metal oxide high-K thin films – from gate dielectrics to nonvolatile memories to LEDs**  
Yue Kuo, Texas A&M University, USA

09:15 - 09:45 **Deep ultraviolet light emitting diodes**  
Michael Shur, Rensselaer Polytechnic Institute, USA

09:45 - 10:15 **Monolithic GE optical emitters for photonic-electronic integration**  
Katsuya Oda, Hitachi, Ltd., Japan

10:15 - 10:45 Coffee break

10:45 - 11:15 **III-V/Ge MOS transistor technologies for future ULSI**  
Shinichi Takagi, The University of Tokyo, Japan

11:15 - 11:45 **Atomically controlled CVD processing of group IV semiconductors for strain engineering and doping in ultralarge scale integration**  
Junichi Murota, Tohoku University, Japan

**Session 8: TFT imagers and others**

Session chairs: Michael Shur, Rensselaer Polytechnic Institute, USA  
Sorin Cristoloveanu, IMEP-LAHC, France

11:45 - 12:15 **Towards a digital radiology roadmap**  
John A. Rowlands, Thunder Bay Regional Research Institute, Canada

12:15 - 12:45 **Flat-panel X-ray image sensor using thin film transistors and field emitter arrays**  
Wei Zhao, SUNY at Stony Brook, USA

13:00 - 14:00 Lunch

14:15 - 14:45 **Wafer-scale CMOS imager technology**  
Nigel M. Allinson, ISDI Ltd., United Kingdom

14:45 - 15:05 **Nanocrystalline silicon thin film transistors for neuromorphic applications**  
Eric M. Vogel, Georgia Institute of Technology, USA

15:05 - 19:30 *Ad hoc* discussions / free time for discussions

19:30 - 21:30 Banquet

21:30 - 22:30 Social hour / Free discussions

**Friday, July 12, 2013**

07:00 - 09:00

Breakfast

Departures

## Poster List

1. **Polychromatic single-shot spectroscopy on SOI-FET trapped electrons**  
Jaime Tenorio-Pearl, Cambridge University, United Kingdom
2. **High mobility IGZO TFT fabricated by solution-based non-vacuum mist chemical vapor deposition**  
Mamoru Furuta, Kochi University of Technology, Japan
3. **Electrical detection of trapped charges using an ultra-thin SOI-FET**  
Stephen Fleming, University of Cambridge, United Kingdom
4. **Temperature dependences of transistor characteristics of SD and LDD POLY-SI TFTS**  
Mutsumi Kimura, Ryukoku University, Japan
5. **Novel application of crystalline indium-gallium-zinc-oxide technology to LSI: Dynamically reconfigurable programmable logic device based on multi-context architecture**  
Yuki Okamoto, Semiconductor Energy Laboratory Co., Ltd., Japan
6. **Multi-bit Unified Memory Concept in FinFETs with ONO Buried Insulator**  
Sorin Cristoloveanu, IMEP-LAHC, France
7. **Electrical characterization of ultrathin silicon-on-insultaro substrates static and split CV measurements in the pseudo-MOSFET**  
Luca Pirro, IMEP-LAHC, France
8. **Reliability evaluation and characterization of FDSOI ultra-thin buried oxides**  
Guillaume Besnard, SOITEC, France
9. **Unusual short-channel effects in SOI MOSFETs**  
Carlos Navarro Moral, IMEP-LAHC, France
10. **An Improved Semi-Classical Model to Investigate Tunnel-FET performance**  
Alberto Revelant, Universita Degli Studi Di Udine, Italy
11. **Etch stop and sacrificial layers materials for 3D co-integration between NEMS and CMOS**  
Julien Philippe, CEA LETI, France