Program

Semiconductor Technology for Ultra Large Scale Integrated Circuits and Thin Film Transistors III

An ECI Conference Series

June 26 - July 1, 2011
Hong Kong, China

Conference Chair

Yue Kuo
Texas A&M University, USA

Conference Co-Chair

Gennadi Bersuker
SEMATECH, USA
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Sunday, June 26, 2011

16:30 – 18:30   Registration
18:30 – 20:00   Welcome Reception

Notes

• Welcome Reception: Salon II & III
• Technical Session: Regency Ballroom I
• Poster Session with Social Hour: Salon I
• Meals:
  o June 27       Lunch & Dinner       Regency Ballroom I
  o June 28       Lunch & Dinner       Regency Ballroom I
  o June 29       Lunch               Regency Ballroom I
  o Dinner on your own
  o June 30       Reception            Sha Tin 18 Upper Deck
  o Banquet Dinner Sha Tin 18 Lower Deck
  o July 1        Lunch               Regency Ballroom I

• Audiotaping, videotaping and photography of presentations are prohibited.
• Speakers – Please leave at least 3-5 minutes for questions and discussion.
• Please do not smoke at any conference functions.
• Turn your cellular telephones to vibrate or off during technical sessions.
• Be sure to make any corrections to your name/contact information on the Master Participant List or confirm (with your initials) that the listing is correct. A corrected copy will be sent to all participants after the conference.
Monday, June 27, 2011

07:00 – 08:00  Breakfast Buffet

08:00 – 08:10  Welcome and Conference Overview
Y. Kuo and G. Bersuker, Conference Chairs

Plenary Talks
Session Chair: Y. Kuo, Texas A&M University

08:10 – 08:55  It's a 3D World - Challenges and opportunities for 3D logic and memory ULSI devices
R. Jammy, SEMATECH

08:55 – 09:40  Semiconductor technology evolution for ULSIC
H.-K. Kang, Samsung Electronics

09:40 – 10:25  Nanoscale metal silicides
L. J. Chen, National Tsing Hua University

10:25 – 10:50  Coffee Break

Nano Devices
Session Chairs: G. Bersuker, SEMATECH
              T. Asano, Kyushu University

10:50 – 11:20  Silicon grow-in-place nanowires and their applications
S. Fonash, Pennsylvania State University

11:20 – 11:50  In-plane silicon nanowires for field effect transistor applications
L. Yu and P. R. i Cabarrocas, CNRS

11:50 – 12:20  Application of graphene and carbon nanotubes to transistors and interconnects
S. Sato, M. Nihei, and N. Yokoyama, AIST

12:20 – 14:00  Lunch

14:00 – 15:30  Panel Discussion: Challenges in extremely large and small scalings
Moderators:  S. Srinivasan and H.-K. Kang

16:00 – 18:30  Free time for discussion, ad hoc sessions, leisure

18:30 – 19:30  Poster Session/Social Hour
Session Chairs: F. Yan, Hong Kong Polytechnic University

19:30 – 20:30  Dinner

20:30 – 21:30  Social Hour & Discussion
Tuesday, June 28, 2011

07:00 – 08:20  Breakfast Buffet

IC Devices & Materials  
Session Chairs:  W. Milne, Cambridge University  
S. J. Fonash, Pennsylvania State University

08:20 – 09:00  
Keynote:  Unipolar CMOS logic for post-Si ULSI and for TFT technologies  
T. P. Ma, Yale University

09:00 – 09:30  
Epitaxial techniques for semiconductor manufacturing  
S. Srinivasan, Applied Materials

09:30 – 10:00  
Electron and hole trapping in polycrystalline and amorphous oxides for novel CMOS devices  
A. Shluger, K. McKenna, University College London; G. Bersuker, SEMATECH

10:00 – 10:30        Coffee Break

Oxide and Organic TFTs  
Session Chairs:    J. Murota, Tohoku University  
S. Srivinasan, Applied Materials

10:30 – 11:00  
Zinc Oxide-Based Transparent TFTs Produced at Low Temperature  
W. Milne, F. Li, M. Mann, R. Waddingham, A. Kiani and  A. Flewitt, Cambridge University

11:00 – 11:30  
High performance a-IGZO TFT and TFT circuits for display application  
J. Jang, Kyung Hee University

11:30 – 11:50  
Comparative analysis of organic thin film transistor structures for flexible E-paper and AMOLED displays  
L. Feng, X. Xu, X. Guo, Shanghai Jiao Tong University

12:00 – 14:00 Lunch

14:00 –  
Afternoon Coffee

14:00 – 16:00  
Panel Discussion:  Challenges in materials and fabrication  
Moderators:    M. Caymax and J. Jang

16:30 – 19:00  
Free Time for discussion,  ad hoc  sessions, leisure.

19:00 – 20:30 Dinner

20:30 – 21:30  Social Hour & Discussion
Wednesday, June 29, 2011

07:00 – 08:00  Breakfast Buffet

**Memories and Interfaces**
Session Chairs:  G. Fortunato, CNR-IMM  
S. Sato, AIST

08:00 – 08:30  Structural characteristics of transition metal oxides enabling resistive memory operations  
G. Bersuker, SEMATECH

08:30 – 09:00  Nonvolatile memories for nano and giga electronics applications  
Y. Kuo, Texas A&M University

09:00 – 09:30  Understanding the switching mechanism in RRAM devices and the dielectric breakdown of ultrathin high-k gate stacks from first principles calculations  
B. Magyari-Kope and Y. Nishi, Stanford University

09:30 – 9:50  Manipulation of graphene properties by interface engineering  
J. B. Xu, X. M. Wang, C. L. Wang, W. G. Xie, and J. Du, The Chinese University of Hong Kong

10:00 – 10:30  Coffee Break

**Si-based TFTs**
Session Chairs:  T. P. Ma, Yale University  
Y. Saito, Toshiba

10:30 – 11:00  Short channel effects and drain field relief architectures in polysilicon TFTs  
G. Fortunato, M. Cuscunà, L. Maiolo, L. Mariucci, M. Rapisarda, A. Pecora and A. Valletta, CNR-IMM, S.D. Brotherton, TFT Consultant, UK

11:00 – 11:30  The potential application of oxide thin film transistor for active matrix display  
T. Mohammed-Brahim and K. Kandoussi, University Rennes 1

11:30 – 12:00  Single-grain germanium TFTs  
R. Ishihara, T. Chen, Delft University of Technology

12:00 – 12:20  Source-gated transistors for versatile large area electronic circuit design and fabrication  

12:20 – 14:00  Lunch

14:00  Free Time for leisure, recreation, discussion *ad hoc* sessions  
Optional Excursions
Dinner on your own
Thursday, June 30, 2011

07:00 – 08:00  Breakfast

IC beyond Si
Session Chairs:  O. Bonnaud, University Rennes 1
                 H. S. Kwok, Hong Kong University of Science Technology

08:30 – 09:00  SiGe, Ge and III-V materials and processes for beyond-Si CMOS and more-than-Moore applications
M. Caymax, IMEC

09:00 – 09:30  Electrical atomically controlled CVD processing for doping in future Si-based devices
J. Murota and M. Sakuraba, Tohoku University; B. Tillack, IHP and Technical University of Berlin

09:30 – 10:00  Physical modeling of charge transport and degradation in high-K stacks for logic device and memory applications
L. Larcher, A. Padovani, and L. Vandelli, Università di Modena e Reggio Emilia; G. Bersuker, SEMATECH

10:00 – 10:30  Coffee Break

TFT Devices and Processes
Session Chairs:  C. Matty, IMEC
                 L. Larcher, Università di Modena e Reggio

10:30 – 11:00  Success in measuring the lowest off-state current of transistors in the world
Y. Sekine, K. Furutani, Y. Shionoiri, K. Kato, J. Koyama, S. Yamazaki,
Semiconductor Energy Laboratory

11:00 – 11:30  Self-heating Issue of poly-Si TFT on glass substrate
T. Asano and G. Nakagawa, Kyushu University

11:30 – 12:00  Bridged-grain TFT
H. S. Kwok, M Wong, S Y Zhao and W Zhou, Hong Kong University of Science and Technology

12:20 – 14:00  Lunch

14:00 – Afternoon Coffee

14:00 – 16:00  Panel Discussion: Challenges in Applications
Moderators:  G. Bersuker and Y. Saito

16:30 – 19:00  Free Time for leisure, recreation, discussion ad hoc sessions

19:00 – 22:00  Conference Banquet
Friday, July 1, 2011

07:00 – 08:00  Breakfast Buffet

**Packages and New Device Principles**  
Session Chairs:  
J. Jang, Kyung Hee University  
A. Shluger, University College London

08:00 – 08:40  
**Keynote:** Recent advances on nano-materials for advanced packaging applications  
C. P. Wong, Chinese University of Hong Kong and Georgia Institute of Technology

08:40 – 09:10  
**Spin-based MOSFET and its applications**  

09:10 – 09:40  
**Flexible thin film transistor arrays as an enabling platform technology:**  
**Opportunities and challenges**  
G. B. Raupp, City University of Hong Kong

09:40 – 10:10  
Coffee Break

10:10 – 11:50  
**TFT New Application**  
Session Chairs:  
C. P. Wong, Chinese University of Hong Kong  
R. Ishihara, Delft University of Technology

10:10 – 10:40  
**Vertical channel thin film transistor: Improvement approach similar to multigate monolithic CMOS technology**  
O. Bonnaud, Z. Peng, E. Jacques and R. Rogel, University Rennes 1

10:40 – 11:00  
**Low power 6.0-Inch extended graphics array reflective liquid crystal display using crystalline indium gallium zinc oxide semiconductor with electronic paper function**  
M. Kaneyasu, H. Miyake, T. Nishi, Y. Hirakata, J. Koyama, S. Yamazaki  
Semiconductor Energy Laboratory Co.; R. Sato, M. Sakamura, Advanced Film Device Inc.

11:00 – 11:30  
**Biosensors based on organic thin film transistors**  
F. Yan, Hong Kong Polytechnic University

11:30 – 11:50  
**MILC PMOS poly-silicon TFT circuits and application in SOP**  
P. Sun, S. Zhao, T.-K. Ho, M. Wong, and H. S. Kwok, Hong Kong University of Science and Technology; Z. Meng, Nankai University

11:50 - 12:00  
**Conclusion of Conference:** Wrap-up, Thanks, and Future  
Y. Kuo, Texas A&M University, and G. Bersuker, SEMATECH

12:10  
Lunch

14:00  
Departure
## List of Posters

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<td>Low power 6.0-inch extended graphics array transmissive liquid crystal display using crystalline indium gallium zinc oxide semiconductor with variable frame frequency</td>
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<td>2. Y. Yuan, E. Ivanov (Tosoh)</td>
<td>Formation and characterization of rare earth metal silicides</td>
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<td>3. J. Li, F. Yan (Hong Kong Polytechnic University)</td>
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