

The 2013 Kyoto Prize Workshop in Advanced Technology

# **Integrated Circuits: 50 Years of Their Evolution and Future Prospects –Towards Higher-Density Memories and Ultra-Low Power LSIs–**

November 12, 2013 (Tue.), 10:00 - 17:00  
Kyoto International Conference Center

## Coordinators

Toshiro Hiramoto (Professor, the University of Tokyo)

Kenji Taniguchi (Member, Kyoto Prize Committee in Advanced Technology; President, Nara National College of Technology)

Takayasu Sakurai (Professor, the University of Tokyo)

Hiroyuki Sakaki (Chairman, Kyoto Prize Committee in Advanced Technology; President, Toyota Technological Institute)

10:00 **Opening Address and Introduction of Laureate**

Hiroyuki Sakaki

**Session I**

Chairperson: Kenji Taniguchi

**Laureate's Lecture**

Robert Heath Dennard (the Laureate in Advanced Technology)

“Past Progress and Future Challenges in LSI Technology -from DRAM and Scaling to Ultra-Low-Power CMOS”

10:40 **Lecture**

Akihiro Nitayama (Deputy General Manager, Center for Semiconductor Research & Development, Toshiba Co.)

“Technology Trends on Advanced Semiconductor Memories”

11:10 **Intermission**

11:20 **Topic Lectures of advanced memory technologies (DRAM, MRAM, ReRAM)**

12:00 **Lecture**

Ken Takeuchi (Professor, Chuo University)

“NAND Flash Memory and Storage Class Memory Hybrid Memory Solution for Future Big Data Application”

12:30 **Intermission**

13:50 **Session II**

Chairperson: Toshiro Hiramoto

**Lecture**

Koji Inoue (Associate Professor, Kyushu University)

“Green Computing: A Computer Architecture Perspective”

14:15 **Lecture**

Mitsumasa Koyanagi (Professor, Tohoku University)

“3D Integration to Achieve Ultra-Low Power Consumption”

14:40 **Lecture**

Shin'ichiro Kimura (Deputy Project Leader, Low-power Electronics Association & Project)

“FD-SOI, Promising Device for Low-power Electronics”

15:05 **Lecture**

Shinichi Takagi (Professor, The University of Tokyo)

“High Mobility Channel Transistor Technologies for Low Power CMOS”

15:40 **Panel Discussion**  
"Future Prospects of Integrated Circuits"  
Moderator Ken Uchida (Professor, Keio University)  
Panelists Tetsuya Asai (Associate Professor, Hokkaido University)  
Ken Takeuchi  
Tetsu Tanaka (Professor, Tohoku University)  
Hitoshi Wakabayashi (Professor, Tokyo Institute of Technology)

17:00 **Closing**

*Organized by Inamori Foundation  
Supported by Kyoto Prefectural Government, Kyoto City Government, NHK  
With the cooperation of IEEE SSCS Japan Chapter, IEEE EDS Japan Chapter, The Japan Society of Applied Physics,  
The Institute of Electrical Engineers of Japan , IEICE/Electronics Society, JSPS/165th committee on Ultra Integrated  
Silicon System*