

---

## Foreword

---

### Yasuo Takahashi

Graduate School of Information Science and Technology,  
Hokkaido University,  
Kita 14, Nishi 9, Kita-ku,  
Sapporo, Hokkaido, 060-0814, Japan  
Email: y-taka@nano.ist.hokudai.ac.jp

### Seiji Samukawa

Institute of Fluid Science,  
Tohoku University,  
2-1-1 Katahira, Aoba-ku,  
Sendai, 980-8577, Japan  
Fax: +81-22-217-5284  
Email: s-samukawa@mwe.biglobe.ne.jp

### Masaki Tanemura

Department of Frontier Material,  
Graduate School of Engineering,  
Nagoya Institute of Technology,  
Gokiso-cho, Showa-ku, Nagoya, 466-8555, Japan  
Email: tanemura.masaki@nitech.ac.jp

### Ken Okano

International Christian University (ICU),  
3-10-2 Osawa, Mitaka,  
Tokyo, 181-8585, Japan  
Fax: +81 422-33-3254  
Email: kenokano@icu.ac.jp

**Biographical notes:** Yasuo Takahashi received the BS, MS, and PhD in Electronics from Tohoku University, Sendai, Japan, in 1977, 1979, and 1982, respectively. He joined the Electrical Communication Laboratories, Nippon Telegraph and Telephone Public Corporation (now NTT), Tokyo, Japan in 1982. Since then, he has been engaged in research on physics and chemistry of the surface and interface of semiconductors. His current work includes the research on quantum physics of Si nano-structures and their electronic device applications particularly to Si single-electron devices (SEDs) and resistance random access memories (ReRAMs). Since 2004, he has been a Professor at the Graduate School of Information Science and Technology, Hokkaido University, Sapporo, Japan. He is a member of the Japan Society of Applied Physics, the Institute of Electrical Engineers of Japan, the Institute of Electronics, Information and Communication Engineers of Japan, and IEEE.

Seiji Samukawa joined NEC in 1981 after graduating in Instrumentation Engineering from Keio University. He worked on the research and development of ultra-precise plasma etching processes for ULSI devices and promoted to Principal Researcher in Microelectronics Laboratory, R&D Group NEC Corporation. He obtained a PhD in Instrumentation Engineering from Keio University in 1992. Since July 2000, he has been a Full Professor at Tohoku University, where he is currently Director of the Innovative Energy Research Center at the Institute of Fluid Science (IFS) Tohoku University. He is also a Principal Investigator (PI) at Advanced Institute of Materials Research (AIMR) Tohoku University, Deputy Director of Material Solutions Center (MaSC) Tohoku University, Joint Appointed Fellow of Advanced Industrial Science and Technology (AIST), and Chair Professor of Taiwan National Chiao Tung University. His significant scientific achievements earned him Ichimura Award (2008) in the New Technology Development Foundation, Prizes for Science and Technology (2009); The Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology, and Plasma Prize (2010) in American Vacuum Society. Additionally, he has been elected as a “Distinguished Professor” of Tohoku University, a ‘Fellow’ of the Japan Society of Applied Physics since 2008 and also a ‘Fellow’ of American Vacuum Society since 2009.

Masaki Tanemura is currently a Professor of Nagoya Institute of Technology (NITech), Nagoya, Japan, and Special Advisor to the President for Regional Partnership in Asia, and also a Director of Multi-Energy Innovation Center at NITech. He received the PhD from NITech in 1988. Before joining NITech in 1991, he worked at Toyota Central Research and Development Laboratories, Inc., Aichi, Japan from 1983 to 1990. He joined also Bonn University, Germany, from 1996 to 1997, as an Alexander von Humboldt Fellow. His recent research activities include the synthesis of graphene and the low-temperature fabrication of one-dimensional nanomaterials, especially the room-temperature growth of carbon nanofibres (CNFs) based on the ion-solid interactions. He has commercialised the CNF probes for atomic force microscope, and was awarded Encouragement Award from Japan Institute of Invention and Innovation for this development.

Ken Okano (PhD) is currently Professor of Natural Science in International Christian University (ICU) in Japan. He received BS, MS and PhD in Electronics from Tokai University, Japan in 1986, 1988, 1991 respectively. He has worked on chemical vapour deposited diamond for more than 30 years and has published over 100 peer reviewed papers including appearance on the magazine nature, and also started research concerning amorphous selenium from 2001. He has experiences working at MIT (USA), University of Cambridge (UK), and National University of Singapore as a Visiting Professor, and received over 10 research grants as a Principle Investigator (PI).

---

*6th IEEE International Nanoelectronics Conference (IEEE INEC 2014)* was held from 28th to 31st July, 2014 at Hokkaido University, Sapporo, Hokkaido, Japan. This is the 6th conference. The first conference was held in Singapore in 2006, followed by Shanghai 2008, Hong Kong 2010, Taiwan 2011, and Singapore 2013. The conference was also organised by IEEE Singapore Section and IEEE Nanotechnology Chapter-Singapore Section, and technically supported by IEEE Electron Devices Society, Japan Society of Applied Physics, and Graduate School of Information Science and Technology

of Hokkaido University. We obtained some funding from The Murata Science Foundation, and Graduate School of Information Science and Technology of Hokkaido University, Core Technology Consortium for Advanced Energy Devices of Tohoku University, and Multi-Energy Innovation Center of Nagoya Institute of Technology.

The theme of the conference was sustainable nanoelectronics, aiming in nanoelectronics for the future. The topics in the conference covered quite wide areas of nanomaterials, nanofabrication, nanodevices, and modelling, such as

- MEMS and NEMS
- nano-photonics
- nano-fabrication
- nano-electronic and CMOS devices/circuits
- energy devices
- spintronics devices
- memory devices
- emission
- nanomaterials and carbon related
- modelling and simulation.

The 253 papers were presented, including three plenary talks and 166 oral presentations, and we had 264 participants including 100 foreign researchers and fruitful discussions in the conference. This special issue of “Sustainable Nanoelectronics” containing eight regular papers is a collection of some of the research papers presented in the conference. Those papers were refereed to the publication standard of *Int. J. Nanotechnology*. The aim of this special issue is to inform the latest researches in the fields of nanoelectronics, including nanomaterials, nanofabrication, nanodevices, and modelling.