Lecture

Evolving functionality in nanomaterial networks

Wilfred G. van der Wiel
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CURRICULUM VITAE

Wilfred van der Wiel (1975) obtained his M.Sc. degree in Applied Physics (cum laude) from Delft University of Technology in The Netherlands in 1997. He did his Ph.D. research on electron transport in quantum dots and electron interferometers both at Delft University of Technology and NTT Basic Research Laboratories in Japan. He obtained his Ph.D. degree (cum laude) in 2002. After that he joined the University of Tokyo as a postdoc and in the same year he was appointed Pioneer (Sakigake) Fellow of the Japan Science and Technology Agency (JST). In 2005 he moved to the MESA+ Institute for Nanotechnology at the University of Twente in The Netherlands, where he took the position of Program Leader of the interdisciplinary nanoelectronics program. Presently he is full professor, holding the Chair NanoElectronics. In 2006 he was awarded the VIDI grant of the Dutch National Science Foundation (NWO) and was appointed as member of De Jonge Akademie of the Royal Netherlands Academy of Arts and Sciences (KNAW). Since the beginning of 2012 he is also member of the Global Young Academy. He has led the bottom-up nanoelectronics research section within the Dutch nanotechnology network NanoNed. In 2009 he received the Starting Grant of the European Research Council (ERC). Van der Wiel is author of more than 60 peer-reviewed journal articles receiving over 3,000 citations.
Watch the new movie “Between Nano and Nature”

RESEARCH INTERESTS

- Quantum electronics
- Hybrid inorganic-organic nanoelectronics
- Organic spintronics

Workshop on Molecular Architectonics – Toward Realization of Neuromorphic Computing by Nanomatrials

June 29-30, 2017

Interdisciplinary Research Building, Osaka University Toyonaka Campus

Thursday, June 29, 2017

10:30-10:40 Opening remarks Hirokazu Tada (Osaka Univ.)

Invited Lecture

(ORDL Seminar Series 9)

O-1 10:40-12:00 Wilfred G. van der Wiel (Univ. of Twente, The Netherlands)
"Evolving functionality in nanomaterial networks"

12:00-13:00 ---------- Lunch ----------

Discussion on Particle-based Architectonics

O-2 13:00-13:40 Saurabh Bose (Univ of Canterbury, New Zealand) (Invited)
"Complex dynamics and promise for neuromorphic computation in self-assembled atomic-switch networks"

O-3 13:40-14:20 Tsuyoshi Hasegawa (Waseda Univ., Japan)
"Learning ability of molecular-gap atomic switch"

O-4 14:20-15:00 Carolin Lutz (Waseda Univ., Japan)
"Tug of War devices for interconnection of artificial synapses"

O-5 15:00-15:20 ---------- Coffee break ----------

Discussion on Fluctuation-derived Functions

O-6 15:20-16:00 Seiya Kasai (Hokkaido Univ., Japan)
"Amoeba-inspired electronic computing system: Fluctuation and solution searching capability"

O-7 16:00-16:40 Hirofumi Tanaka (Kyusyu Institute of Technology, Japan)
"Neuron-like Pulse generation device by SWNT/POM complex"

16:40-18:00 Poster session

18:00- Dinner and Networking

Friday, June 30, 2017

Discussion on Molecular Networks and Layers

O-8 9:00-9:40 Florian Lebon (CEA, Univ. Paris-Saclay, France) (Invited)
"Influence of the electrografting parameters on the growth of organic thin layers on patterned gold electrodes"

O-9 9:40-10:20 Yuki Usami (Osaka Univ., Japan)
"Conjugated electrical properties of Au nanoparticles-polyaniline network"

10:20-10:40 ---------- Coffee break ----------

O-10 10:40-11:20 Megumi Akai (Osaka Univ. Japan)
"On the Growing Polymer Neural Networks"

O-11 11:20-12:00 Gideon Issac Livshits (Osaka Univ., Japan)
"Conductivity of DNA towards field-assisted programmable DNA networks"

12:00 Closing Remarks Takuya Matsumoto (Osaka Univ.)

Poster presentations

"All Posters are intended for *Young Researcher Award*"

Poster size H2100mm × W900

P-1 Kenta Saitoh (Hokkaido Univ.)
"Impact of External Fluctuation on Solution Search in Amoeba-inspired Electronic Computing System"

P-2 Carolin Lutz (Waseda Univ.)
"Tug of War devices for interconnection of artificial synapses"

P-3 Yuki Shigeoka (Waseda Univ.)
"Rate limiting process of Cu/Ta2O5/Pt atomic switch"

P-4 Naoya Tanabashi (Waseda Univ.)
"Atmosphere dependence of Ag/Ta2O5/Pt atomic switch"

P-5 Ayana Suzuki (Waseda Univ.)
"STM-LTM-based learning of molecular-gap atomic switch"

P-6 Ai Kasai (Waseda Univ.)
"Synaptic operation of molecular-gap atomic switch"

P-7 Yuki Usami (Osaka Univ.)
"Conjugated electrical properties of Au nanoparticles-polyaniline network"

P-8 Satoshi Nishijima (Osaka Univ.)
"Non-linear I-V characteristics of Ru complex layers with a double junction nanogap electrode"

P-9 Masaya Yamada (Osaka Univ.)
"Probing electronic alignment between organic dye molecule and gold film interface by Kelvin probe force microscopy"

P-10 Kento Araki (Osaka Univ.)
"Micro-second Time-resolved Electrostatic Force Microscopy"

P-11 Faisal Budiman (Kyushu Institute of Technology)
"Size Dependent Magnetic Properties of La2CuO4 and La2-xSrxCuO4 Nanoparticles Fabricated by Sol-Gel Method"

P-12 Hadiya Warman (Kyushu Institute of Technology)
"Ag-Ag2S core-shell nanoparticles synthesis and random network fabrication for reservoir computing

P-13 Hideaki Furuki (Kyushu Institute of Technology)
"Fabrication of graphene nanoribbon by unzipping single-walled carbon nanotubes and investigating the suitable condition by Design of Experiments

P-14 Minoru Fukumori (Osaka University)
"Unzip of Single- and Double-walled Carbon Nanotubes to Synthesize Single-Layer Graphene Nanoribbon Using Radical Initiator

P-15 Detiza Goldianto (Kyushu Institute of Technology)
"Molecular Electronic Devices of Random Single-Walled Carbon Nanotubes Network Adsorbed with SV2W10O40[H4t-BuTPP]"

P-16 Yurina Hidaka (Kyushu Institute of Technology)
"Fabrication of Ag/Ag2S structure and measurement of electrical property"

P-17 Florian Lebon (CEA, Univ. Paris-Saclay,)
"Influence of the electrografting parameters on the growth of organic thin layers on patterned gold electrodes"

P-18 Agung Setiadi (Osaka Univ.)
"Random Telegraph Signal in Molecule-functionalized Carbon Nanotube Electronic Devices"

P-19 Agung Setiadi (Osaka Univ.)
"Single walled carbon nanotube-based stochastic resonance device with molecular self-noise source"

P-20 Masahiro Takayama (Osaka Univ.)
"A Tip-enhanced Raman Spectroscopy Study of Self-assembled 2,13-bis(aldehyde)[7]-thiaheterohelicene Molecules"

P-21 W.Hikita (Osaka Univ.)
"Polymer based auto encoder system for pattern recognition"