

# The 16<sup>th</sup> Takayanagi Kenjiro Memorial Symposium

Research Institute of Electronics, Shizuoka University

## *Toward Advanced Imaging Science Creation*

Interdisciplinary Innovation in Nano Vision,  
Materials Science, and Mechatronics

Tuesday, November 11, 2014

**10:00 Opening: Chair; Hideki Asai**

**Yukihiro Ito (President of Shizuoka University)**

**Taichi Usui (Trustee of Shizuoka University)**

**Hidenori Mimura (Director of Research Institute of Electronics, Shizuoka University)**

**10:15 PL1, Plenary Session 1: Plenary Talks**

**Chair; Hideki Asai**

1-1. (*Invited*) Strain engineering via octahedral distortions in epitaxial perovskite oxide films ..... PL1-1

Arturas Vailionis (Stanford University, USA)

**10:45 PL1, Plenary Session 1 : Plenary Talks**

**Chair; Michiharu Tabe**

1-2. (*Invited*) TeraByte/s Data-bandwidth TSV and Interposer Design for 2.5D and 3D IC ..... PL1-2

Joungho Kim (Department of Electrical Engineering, KAIST, Korea)

1-3. (*Invited*) Beam focusing/imaging in reflections from sub-wavelength gratings... PL1-3

Yu-Chieh Cheng<sup>1</sup>, and K.Staliunas<sup>1,2</sup> (<sup>1</sup>Universitat Politècnica de Catalunya,

<sup>2</sup>Institució Catalana de Reserca i Estudis Avançats (ICREA), Spain)

1-4. (*Invited*) Bio-inspired Nonlinear Nano-devices for Coexisting with Fluctuation · PL1-4

Seiya Kasai (Research Center for Integrated Quantum Electronics,

Hokkaido University, Japan)

**12:15 Lunch**

**14:00 CP1, Collaborative Project Session 1: Collaborative Project Supported by Special Budget for Education and Research**

**Chair; Hiroya IKEDA**

- 1-5. *(Invited)* Methodology of single atom control for quantum processing in silicon and diamond..... CP1-1  
Takahiro Shinada (Tohoku University, Japan)
- 1-6. *(Invited)* Application of terahertz imaging in pharmaceutical sciences ..... CP1-2  
Tomoaki Sakamoto (National Institute of Health Sciences, Japan)

**15:00 PS1, Poster Session 1: Young Researchers' Presentations (Poster Viewing)**

1. Contribution of Phonon Transport to Seebeck Coefficient of P-Doped SOI Layer · PS1-1  
F. Salleh<sup>1</sup>, T. Oda<sup>1</sup>, Y. Suzuki<sup>1</sup>, Y. Kamakura<sup>2</sup>, and H. Ikeda<sup>1</sup> (<sup>1</sup>RIE, Shizuoka University, <sup>2</sup> Graduate School of Engineering, Osaka University, Japan)
2. Study on the Theoretical Estimation of Phonon-Drag Part of Seebeck coefficient between Ge-on-insulator and Si-on-insulator ..... PS1-2  
V. Manimuthu<sup>1</sup>, S. Yoshida<sup>2</sup>, Y. Suzuki<sup>2</sup>, F. Salleh<sup>2</sup>, and H. Ikeda<sup>2</sup> (<sup>1</sup> Graduate School of Science and Technology, <sup>2</sup>RIE, Shizuoka University, Japan)
3. Visualization of entry of cell-penetrating peptide transportan 10 into a single vesicle by translocating across lipid membrane and its induced pores ..... PS1-3  
Md. ZahidulIslam<sup>1</sup>, H. Ariyama<sup>1</sup>, J. Md. Alam<sup>2</sup>, and M. Yamazaki<sup>1,2</sup>, ( <sup>1</sup> Graduate School of Science and Technology, <sup>2</sup>RIE, Shizuoka University, Japan)
4. Visualization of initial step of pore formation induced by antimicrobial peptide magainin 2 ..... PS1-4  
J. Md. Alam<sup>1</sup>, Md. Abu Sayem Karal<sup>2</sup>, T. Takahashi<sup>3</sup>, V. Levadnay<sup>4</sup>, and M. Yamazaki<sup>1,2,3</sup> (<sup>1</sup>RIE, <sup>2</sup>Graduate School of Science and Technology, <sup>3</sup>Faculty of Science, Shizuoka University, Japan, <sup>4</sup>Russian Academy of Sciences, Russia)
5. Psychological states to sound stimuli evaluated by alpha wave ..... PS1-5  
Xi Chen<sup>1</sup>, Y. Mizutani<sup>3</sup>, I. Takahashi<sup>1</sup>, Y. Okita<sup>1,2</sup>, H. Hirata<sup>3</sup>, and T. Sugiura<sup>1,2,3</sup> (<sup>1</sup> Graduate School of Science and Technology, <sup>2</sup>Graduate School of Engineering, <sup>3</sup>RIE, Shizuoka University, Japan)
6. Stress induced effect of Ca-doped Barium Zirconate Titanate thin films by RF magnetron sputtering ..... PS1-6  
T. Arai<sup>1</sup>, Y. Kamai<sup>2</sup>, N. Sakamoto<sup>3</sup>, T. Ohno<sup>4</sup>, T. Matsuda<sup>4</sup>, N. Wakiya<sup>3</sup>, and H. Suzuki<sup>3</sup> (<sup>1</sup>Graduate School of Science and Technology, <sup>2</sup>Graduate School of Engineering, <sup>3</sup>RIE, Shizuoka University, <sup>4</sup>Kitami Institute of Technology, Japan)
7. Low-temperature spectroscopy of donor states in silicon nano-channels..... PS1-7  
D. Moraru, A. Samanta, T. Tsutaya, Y. Takasu, T. Mizuno, and M. Tabe (Research Institute of Electronics, Shizuoka University, Japan)

8. Single Electron Transport in Double-Donor System at Si/SiO<sub>2</sub> Interface in Ultrathin SOI-FETs ..... PS1-8  
A. Samanta, D. Moraru, T. Mizuno, and M. Tabe  
(Research Institute of Electronics, Shizuoka University, Japan)
9. KPFM observation of donors in field effect transistor channel ..... PS1-9  
K. Tyszka<sup>1,2</sup>, D. Moraru<sup>1</sup>, T. Mizuno<sup>1</sup>, R. Jablonski<sup>2</sup>, and M. Tabe<sup>1</sup> (<sup>1</sup>RIE, Shizuoka University, Japan, <sup>2</sup>Warsaw University of Technology, Poland)
10. Development of microparticle manipulation by optically controllable electrophoresis ..... PS1-10  
T. Nagashima<sup>1</sup>, W. Inami<sup>1</sup>, and Y. Kawata<sup>1,2</sup> (<sup>1</sup>Graduate School of Engineering, <sup>2</sup>RIE, Shizuoka University, Japan)
11. Surface hydrophilicity control of silicon nitride for cell culture ..... PS1-11  
Y. Masuda<sup>1</sup>, Y. Nawa<sup>2</sup>, T. Furukawa<sup>2</sup>, S. Lin<sup>2</sup>, W. Inami<sup>3</sup>, and Y. Kawata<sup>2</sup>  
(<sup>1</sup>Graduate School of Science and Technology, <sup>2</sup>RIE, <sup>3</sup>Graduate School of Engineering, Shizuoka University, Japan)
12. Fabrication of luminescent thin films for electron beam excitation assisted optical microscope ..... PS1-12  
T. Furukawa<sup>1,4</sup>, S. Kanamori<sup>2</sup>, M. Fukuta<sup>2</sup>, Y. Nawa<sup>1,4</sup>, H. Kominami<sup>1</sup>, Y. Nakanishi<sup>1</sup>, A. Sugita<sup>3</sup>, W. Inami<sup>1,4</sup>, and Y. Kawata<sup>1,4</sup> (<sup>1</sup>RIE, <sup>2</sup>Faculty of Engineering, <sup>3</sup>Department of Materials Science, Shizuoka University, <sup>4</sup>CREST, Japan Science and Technology Agency, Japan)
13. The evaluation of cathodoluminescence analysis excited in Y<sub>2</sub>O<sub>3</sub>: Eu<sup>3+</sup> luminescent thin film ..... PS1-13  
M. Fukuta<sup>1</sup>, W. Inami<sup>2</sup>, A. Ono<sup>2</sup>, and Y. Kawata<sup>2</sup> (<sup>1</sup>Graduate School of Science and Technology, <sup>2</sup>RIE, Shizuoka University, Japan)
14. High Sensitive Bioimaging using Surface Plasmon Resonance in Deep Ultraviolet Region ..... PS1-14  
M. Kikawada<sup>1</sup>, A. Ono<sup>2,3,4</sup>, W. Inami<sup>2,3,4</sup>, and Y. Kawata<sup>1,2,4,5</sup> (<sup>1</sup>Graduate School of Science and Technology, <sup>2</sup>RIE, <sup>3</sup>Department of Electronics and Materials Science, Shizuoka University, <sup>4</sup>CREST, Japan Science and Technology Agency, <sup>5</sup>Department of Mechanical Engineering, Graduate School of Engineering, Shizuoka University, Japan)
15. Label-free organelle imaging with high spatial resolution by D-EXA microscopy ..... PS1-15  
Y. Nawa<sup>1,2</sup>, W. Inami<sup>1,3</sup>, A. Ono<sup>1,3</sup>, S. Lin<sup>1</sup>, Y. Kawata<sup>1,3</sup>, and S. Terakawa<sup>3</sup> (<sup>1</sup>RIE, Shizuoka University, <sup>2</sup> Research Fellow of the Japan Society for the Promotion of Science, <sup>3</sup>CREST, Japan Science and Technology Agency, <sup>4</sup>Faculty of Health Science, Tokoha University, Japan)

16. Analysis of the metallic nanostructure surface plasmon modes by the cathodoluminescence method ..... PS1-16  
M. Kawashima<sup>1</sup>, A. Ono<sup>2,3</sup>, W. Inami<sup>1,2,3</sup>, and Y. Kawata<sup>1,2,3</sup> (<sup>1</sup>Graduate School of Science and Technology, <sup>2</sup>JST-CREST <sup>3</sup>RIE, Shizuoka University, Japan)
17. The Characteristics of Nanocrystalline MgFe<sub>2</sub>O<sub>4</sub> Spherical Particles Prepared by Ultrasonic Spray Pyrolysis Method for Hyperthermia Applications ..... PS1-17  
H. Das<sup>1,2</sup>, N. Sakamoto<sup>3</sup>, H. Aono<sup>4</sup>, K. Shinozaki<sup>5</sup>, H. Suzuki<sup>1,3</sup>, and N. Wakiya<sup>1,3</sup> (<sup>1</sup>Graduate School of Science and Technology, Shizuoka University, Japan <sup>2</sup>Bangladesh Atomic Energy Commission, Bangladesh, <sup>3</sup>Research Institute of Electronics, Shizuoka University, <sup>4</sup>Ehime University, <sup>5</sup>Tokyo Institute of Technology, Japan)
18. Hydrothermal growth of three dimensional ZnO nanostructures from one dimensional nanorods and functional properties ..... PS1-18  
M. Navaneethan, J. Archana, T. Koyama, and Y. Hayakawa (Research Institute of Electronics, Shizuoka University, Japan)
19. Hydrothermal synthesis of mesoporous TiO<sub>2</sub> spheres and the performance of dye sensitized solar cells ..... PS1-19  
J. Archana, M. Navaneethan, T. Koyama, and Y. Hayakawa (Research Institute of Electronics, Shizuoka University, Japan)
20. Energy transferred emission of NaGdF<sub>4</sub>:Yb:Tm@NaGdF<sub>4</sub>/Cs<sub>2</sub>Mo<sub>6</sub>Br<sub>14</sub> ..... PS1-20  
D. Thangarajua<sup>4</sup>, P. Gredin<sup>1</sup>, M. Mortier<sup>1</sup>, T. Aubert<sup>2</sup>, C. Neaime<sup>2</sup>, S. Cordier<sup>2</sup>, F. Grasset<sup>2</sup>, R. Karthikeyan<sup>3,4</sup>, T.Koyam<sup>1,4</sup>, M. Arivanathan<sup>4</sup>, and Y. Hayakawa<sup>4</sup> (<sup>1</sup>UPMC-Chimie ParisTech, France, <sup>2</sup>Université de Rennes, France, <sup>3</sup>GSST, <sup>4</sup>RIE, Shizuoka University, Japan)
21. Development of high sensitivity photodetector using amorphous selenium and diamond cold cathode ..... PS1-21  
T. Masuzawa<sup>1</sup>, J. Ochiai<sup>2</sup>, A. Ohata<sup>2</sup>, R. Tsukimura<sup>2</sup>, M. Onishi<sup>2</sup>, T. Ebisudani<sup>2</sup>, I. Saito<sup>2</sup>, T. Yamada<sup>3</sup>, Y. Neo<sup>1</sup>, H. Mimura<sup>1</sup>, and K. Okano<sup>2</sup> (<sup>1</sup>RIE, Shizuoka University, <sup>2</sup>International Christian University, <sup>3</sup>AIST, Japan)
22. P(VDF:TrFE/75:25) Nanofibers web for Piezoelectric device ..... PS1-22  
M. Noyori, Y. Neo, and H. Mimura (RIE, Shizuoka University, Japan)
23. Fast Circuit Transient Simulation based on Multi-GPU LIM ..... PS1-23  
Y. Inoue<sup>1</sup>, and H. Asai<sup>2</sup> (<sup>1</sup>Graduate School of Engineering, <sup>2</sup>Research Institute of Electronics, Shizuoka University, Japan)

**17:30 Reception (to 19:30) North Cafeteria, Hamamatsu Campus, Shizuoka University**

## Wednesday, November 12, 2014

### 9:00 TP2 : Takayanagi Session, Lectures of Takayanagi Prize Winners

**Chair; Yoshimasa Kawata**

- 2-1. *(Invited)* Effect of gravity on the dissolution and growth processes of InGaSb ternary alloy bulk semiconductor..... TP2-1  
Yasuhiro Hayakawa (RIE, Shizuoka University, Japan)
- 2-2. *(Invited)* Single-shot measurement of terahertz temporal waveforms using probe pulse with tilted pulse front ..... TP2-2  
Yoichi Kawada (Hamamatsu Photonics K. K., Japan)
- 2-3. *(Invited)* Inverter Frequency and Transformer for Low Frequency Power Transmission ..... TP2-3  
Atsushi Nakata (Shizuoka Institute of Science and Technology, Japan)
- 2-4. *(Invited)* Single-crystalline organic semiconductor microcavities ..... TP2-4  
Kazuki Bando (Graduate School of Science, Shizuoka University, Japan)

### 10:30 Coffee Break

### 10:50 PL2, Plenary Session 2 : Plenary Talks

**Chair; Hisao Suzuki**

- 2-5. *(Invited)* High reflection coating on a silver nanorod array for enhanced directional scattering..... PL2-1  
Yi-Jun Jen (National Taipei University of Technology, Taiwan)

### 11:20 CP2, Collaborative Project Session 2: Collaborative Project Supported by Special Budget for Education and Research

**Chair; Hisao Suzuki**

- 2-6. *(Invited)* Sensor surfaces..... CP2-1  
Saulius Juodkazis (Swinburne University of Technology and Melbourne Center for Nanofabrication, Australia)
- 2-7. *(Invited)* Phosphorescence and long after glow property of  $MSi_2O_2N_2:Eu$  (M=Ca, Sr, Ba) powder ..... CP2-2  
Hidetoshi Miyazaki (Shimane University, Japan)

**12:20 Lunch**

**14:10 NM2, RIE Session: Researches by New Members of Research Institute of Electronics  
Chair; Yasuhiro Hayakawa**

- 2-8. Designing CMOS image sensors as a key building block of new camera systems  
.....NM2-1  
Keiichiro Kagawa, Taishi Takasawa, Min-Woong Seo, Keita Yasutomi, and Shoji Kawahito (RIE, Shizuoka University, Japan)
- 2-9. Continuous wave GaP terahertz signal generator for industrial use .....NM2-2  
Tetsuo Sasaki<sup>1</sup>, Tadao Tanabe<sup>2</sup>, and Jun-ichi Nishizawa<sup>3</sup> (<sup>1</sup>RIE, Shizuoka University, <sup>2</sup>Institute of Multidisciplinary Research for Advanced Materials, <sup>3</sup>Nishizawa Center, Tohoku University, Japan)
- 2-10. Functions of Lipid in the Photosynthetic Membranes.....NM2-3  
Koichiro Awai<sup>1,2,3</sup>, Hiroyuki Ohta<sup>4,5,6</sup>, and Naoki Sato<sup>6,7</sup> (<sup>1</sup>Graduate School of Science, <sup>2</sup>RIE, Shizuoka University, <sup>3</sup>JST, PRESTO, <sup>4</sup>Center for Biological Resources and Informatics, <sup>5</sup>Earth-Life Science Institute, Tokyo Institute of Technology, <sup>6</sup>JST, CREST, <sup>7</sup>Graduate School of Arts and Sciences, University of Tokyo, Japan)
- 2-11. Flower/pillar structured InN crystals grown by HCVD method under atmospheric pressure .....NM2-4  
Naonori Sakamoto<sup>1</sup>, Haruka Sugiura<sup>2</sup>, Tomohiro Murase<sup>3</sup>, Yumiko Kodama<sup>4</sup>, Takanori Kiguchi<sup>4</sup>, Toyohiko Konno<sup>4</sup>, Naoki Wakiya<sup>1</sup>, and Hisao Suzuki<sup>1</sup> (<sup>1</sup>RIE, <sup>2</sup>Graduate School of Science and Technology, <sup>3</sup> Graduate School of Engineering, Shizuoka University, <sup>4</sup>Institute for Materials Research, Tohoku University, Japan)
- 2-12. Resolution-improved Optical Imaging by Low-coherence Interference Illumination  
.....NM2-5  
Shin Usuki, Tomohiro Takada, and Kenjiro Miura (Research Institute of Electronics, Shizuoka University, Japan)

**15:50 Closing**

**Hideki Asai (Symposium Chair)**