

PCOS 2012 TECHNICAL PROGRAM

November 29 (Thursday), 2012

12:45 - 12:50 **Opening Remarks** Symposium Co-chair, Suzuki, Hiroyasu (Pulstec Industrial Co., Ltd.)

12:50 - 12:55 **Opening Speech** General Chair, Yamada, N. (Kyoto University)

Session 1. *Presiders:* Yamada, N (Kyoto University),
Kuwahara, M (National Institute of Advanced Science and Technology)

12:55 -13:05 (Special)

A01. The Great Father of Phase Change Memory, Stanford R. Ovshinsky

Ohta, T.

Ovonic Phase Change Institute

13:05 - 15:45 (Invited)

A02. Dynamical study of photoinduced structural phase transitions

Tanimura, K.

The Institute of Scientific and Industrial Research, Osaka University

13:45 - 14:25 (Invited)

A03. Development of Thermophotovoltaic Generation of Electricity using Spectral-Controlled Near-Field Thermal Radiation

Hanamura, K.

Tokyo Institute of Technology

14:25 - 15:05(Invited)

A04. Developments of optical-functional materials by chemical synthesis methods

Ohkoshi, S. 1,2

¹Department of Chemistry, School of Science, The University of Tokyo

²CREST, JST

15:05 - 15:20 **Coffee Break**

Session 2. *Presiders:* Irie, Mitsuru (Osaka Sangyo University),
Fuji, Y (Elpida Memory, Inc.)

15:20 - 16:00(Invited)

A05. Scalable High Performance PRAM for Storage Class Memory

Horii, H., Park, J.H., Han, S.M., Kim, D.H., Jung, S.W., Wu, Z., Ahn, J.K., Park, Y.W.,
Kim, J.U., Cho, S.L., Ahn, D.H., Lee, J.M., Nam, S.W., Kang, H.K. and Chung, C.H.

Semiconductor R&D Center, Samsung Electronics Co., Ltd.

16:00 – 16:25

- A06. Current-driven crystallization promotion for multilevel storage in phase-change memory**
Yin, Y., Alip, R. I., and Hosaka, S.
Graduate Sch. of Eng., Gunma University

16:25 – 16:50

- A07. Hybrid Memory Architecture of PCM and NAND flash memories for Enterprise Storage**
Takeuchi, K.
Department of Electrical, Electronic and Communication Engineering, Chuo University

Poster Session

- P1. First-principles calculation of the band structures and the electronic states of λ -Ti₃O₅ and β -Ti₃O₅**

Tanaka, K.¹, Toshiaki Nagata, T.¹, Nasu, T.¹, Hakoe, F.¹, Namai, A.¹, Tokoro, H.^{1,2}, and Ohkoshi, S.^{1,3}

¹ Department of Chemistry, School of Science, The University of Tokyo

² NEXT, JSPS

³ CREST, JST

- P2. Synthesis methods of a photo-induced phase transition material of λ -Ti₃O₅**

Nasu, T.¹, Tanaka, K.¹, Hakoe, F.¹, Namai, A.¹, Tokoro, H.^{1,2}, and Ohkoshi, S.^{1,3}

¹ Department of Chemistry School of Science, the University of Tokyo

² NEXT, JSPS

³ CREST, JST

- P3. Study of the reversible durability of photo-induced phase transition on λ -Ti₃O₅**

Hakoe, F.¹, Umeta, Y.¹, Nagata, T.¹, Tanaka, K.¹, Nasu, T.¹, Namai, A.¹, Tokoro, H.^{1,2}, and Ohkoshi, S.^{1,3}

¹ Department of Chemistry School of Science, the University of Tokyo

² NEXT, JSPS

³ CREST, JST

- P4. Optical properties of λ -Ti₃O₅ exhibiting a room-temperature photoreversible phase transition**

Nagata, T.¹, Tanaka, K.¹, Nasu, T.¹, Hakoe, F.¹, Namai, A.¹, Tokoro, H.^{1,2}, and Ohkoshi, S.^{1,3}

¹ Department of Chemistry School of Science, the University of Tokyo

² NEXT, JSPS

³ CREST, JST

- P5. Effect of TiN Underlayer for Fabricating Interfacial Phase Change Memories**
Shintani, S., Morikawa, T.*, and Odaka, T.
Collaborative Research Team Green Nanoelectronics Center,
National Institute of Advanced Industrial Science and Technology
- P6. Mach Zehnder Interferometer Optical Switch Using Phase-Change Material**
Jain, P.¹, Tanaka, D.¹, Tsuda, H.¹, Kuwahara, M.², Wang, X.², and Kawashima, H.²
¹Department of Electronics and Electrical Engineering, Keio University
²National Institute of Advanced Industrial Science and Technology
- P7. Switching property of localized surface plasmon resonance of gold nanoparticles on a GeSbTe phase change thin film**
Homma, T., Hira, T., and Saiki, T.
Graduate School of Science and Technology, Keio University
- P8. Neuronal functionality obtained by localized surface plasmon resonance with phase change material**
Uchiyama, T., Kuroki, M., and Saiki, T.
Graduate School of Science and Technology, Keio University
- P9. Spatially inhomogeneous stress impression on semiconductor quantum dots using volume expansion of phase change material**
Takahashi, M., Nurrul Syafawati Humam, Tsumori, N., and Saiki, T.
Graduate School of Science and Technology, Keio University
- P10. Micro-Raman study of amorphous GeSbTe recording marks induced by femtosecond laser pulse excitation**
Kitamura, N., Katsumata, Y., Morita, T., Hira, T., and Saiki, T.
Graduate School of Science and Technology, Keio University
- P11. Optical anisotropy in a GeSbTe thin film induced by amorphization with femtosecond laser pulse excitation**
Katsumata, Y., Kitamura, N., Morita, T., and Saiki, T.
Graduate School of Science and Technology, Keio University
- P12. Study of CVD process of GeSbTe by first principles calculations**
Ichikawa, K., Senami, M., Ikeda, Y., Nozaki, H., and Tachibana, A.
Department of Micro Engineering, Kyoto University

P13. Density measurement of Ge₂Sb₂Te₅ as a function of temperature

Yokoyama, Y.¹, Endo, R.¹, Kuwahara, M.², Kobayashi, Y.¹, and Susa, M.¹

¹ Dept of Metallurgy and Ceramics Science, Tokyo Institute of Technology

² Electronics and Photonics Research Institute, National Institute of Advanced Industrial Science and Technology

P14. Reliability evaluation items for Archival Storage in BD

Irie, M.¹, Okino, Y.², and Kubo, T.³

¹ Faculty of Engineering, Osaka Sangyo Univ.

² High Tech Research Center, Kansai Univ.

³ T. KUBO Eng. Sci. Office

P15. High Density NAND Phase Change Memory with Block-Erase Architecture and Investigations for Write and Disturb Requirements

Johguchi, K.¹, Yoshioka, K.², and Takeuchi, K.¹

¹ Department of Electrical, Electronic, and Communication Engineering, Chuo University

² Graduate School of Engineering, University of Tokyo

Reception

19:10 – 21:10

November 30 (Friday), 2012

Session 3. *Presiders:* Yusu, K. (New Energy and Industrial Technology Development Organization),
Ogino, Y. (Hitachi Computer Peripherals Company Ltd.)

9:00 – 9:40 (Invited)

A08. High resolution live cell imaging with electron-beam assisted (EXA) optical microscopy

Kawata, T.^{1,3}, Nawa, Y.¹, and Inami, W.^{2,3}

¹Shizuoka University, Faculty of Engineering

²Shizuoka University, Global Research Leaders

³JST, CREST

9:40 – 10:20 (Invited)

A09. Anomalous X-ray scattering reveals the role of constituent elements in Ge₂Sb₂Te₅

Kohara, S.¹, Ohara, K.¹, Temleitner, L.^{1,2}, Sugimoto, K.¹, Matsunaga, T.³, Pusztai, L.²

Itou, M.¹, Ohsumi, H.⁴, Kojima, R.³, Yamada, N.³, Usuki, T.⁵, Fujiwara, A.¹ and Takata, M.^{1,4}

¹JASRI/ SPring-8

²Wigner Research Centre for Physics, Hungarian Academy of Sciences (Hungary)

³Panasonic Corporation

⁴RIKEN

⁵Department of Material and Biological Chemistry, Faculty of Science, Yamagata University

10:20 – 10:40 **Coffee Break**

Session 4. *Presiders:* Kojima, R. (Panasonic Corp.),
Kurokawa, K. (Sony Corp.)

10:40 – 11:05

A10. A study on phase change characteristics of Ge-Cu-Te ternary alloy thin films

Sutou, Y., Saito, Y., and Koike, J.

Department of Materials Science, Graduate School of Engineering, Tohoku University

11:05 – 11:30

**A11. Low-Power Switching in Phase-Change Memory using New Superlattice :
SnTe/Sb₂Te₃ System**

Soeya, S., Odaka, T., Morikawa, T., Shintani, T., and Tominaga, J

Collaborative Research Team Green Nanoelectronics Center,

National Institute of Advanced Industrial Science and Technology

11:30 – 11:55

A12. Crystallization properties of Ge-Sb and Ge-Bi-Te nanoparticles by pulsed laser irradiation

Mihara, T., Tsuchino, A., Sato, S., Hisada, K., Kojima, R., Yamada, N., and Furumiya, S.

Advanced Technology Research Laboratories, Panasonic Corporation

11:55 – 12:20

A13. Magnetic Properties and Band Structures in Superlattice Phase-change Memory

Tominaga, J.¹, Kolobov, A.V.¹, and Fons, P.¹

¹Green Nanoelectronics Center, Nanoelectronics Research Institute,
National Institute of Advanced Industrial Science and Technology

12:20 – 13:50 **Photo and Lunch**

Session 5. *Presiders:* Yuzurihara, H.(Richo Company Ltd.)
Fuji, Y (Elpida Memory, Inc.)

13:50 – 14:15

**A14. Self-holding optical switch using phase-change material
for energy efficient photonic network**

Tsuda, H.¹, Tanaka, D.¹, Kuwahara, M.², Wang, X.², and Kawashima, H.²

¹ Graduate School of Science and Technology, Keio University

² National Institute of Advanced Industrial Science and Technology

14:15 – 14:40

**A15. Ultrafast dynamics of coherent phonons in phase change materials:
Evaluation of thermal conductivity**

Hase, M.¹, and Tominaga, J.²

¹Institute of Applied Physics, University of Tsukuba

²Nanoelectronics Research institute,

National Institute of Advanced Industrial Science and Technology

14:40 – 15:05

**A16. Ultrafast nanoscale optical properties of phase change materials
and its possible applications to neuron-inspired devices**

Saiki, T.

Department of Electronics and Electrical Engineering, Keio University

15:05 – 15:25 **Coffee Break**

Session 6. *Presiders:* Shintani, T. (National Institute of Advanced Science and Technology)
Suzuki, H. (Pulstec Industrial Co., Ltd.)

15:25 – 15:50

A17. Role of antimony in structure and properties of the layered CeTe-Sb₂Te₃ memory alloys

Kolobov, A.V., Fons, P., and Tominaga, J.

National Institute of Advanced Industrial Science and Technology

15:50 – 16:15

A18. High Speed Crystal Growth in Phase-change Recording Materials for Practical Use

Matsunaga, T.¹, Kojima, R.², Yamada, N.³, Kifune, K.⁴, Kubota, Y.⁵, and Kohara, S.⁶

¹ Device Solutions Center, R&D Division, Panasonic Corporation

² AVC Networks Company, Panasonic Corporation

³ Department of Materials Science & Engineering, Kyoto University

⁴ Faculty of Liberal Arts and Sciences, Osaka Prefecture University

⁵ Graduate School of Science, Osaka Prefecture University

⁶ Japan Synchrotron Radiation Research Institute/SPring-8

16:15 – 16:40

A19. Study of GeCu₂Te₃ by Hard X-ray Photoelectron Spectroscopy

Kobayashi, K.^{1,2}, Kobata, M.^{1,3}, Saito, Y.⁴, Sutou, Y.⁴, and Koike, J.⁴

¹ Condensed Matter Science Division, Japan Atomic Energy Agency

² Hiroshima Synchrotron Radiation Center, Hiroshima University

³ VG Scienta. Blue Building 4F

⁴ Department of Materials Science, Graduate School of Engineering, Tohoku University

16:40 – 17:05

A20. Searching for Disorder in Order

Fons, P.^{1,2}, Kolobov, A.^{1,2}, Richter, J.¹, Matsunaga, T.³, Yamada, N.⁴, and Tominaga, J.¹

¹ National Institute of Advanced Science and Technology

² SPring-8, Japan Synchrotron Radiation Institute (JASRI)

³ Materials Science and Analysis Technology Center, Panasonic Corporation

⁴ Digital & Network Technology Development Center, Panasonic Corporation

17:05 – 17:15 **Best Paper Awarding** General Chair, Dr. N. Yamada (Kyoto University)

17:15 – 17:20 **Closing Remarks** M. Kuwahara

(National Institute of Advanced Industrial Science and Technology)

