PCOS 2017 TECHNICAL PROGRAM (final ver.)

November 16th (Thursday), 2017

12:00 – 13:00 **Registration**

13:00 – 13:05 **Opening Remarks** Symposium Co-chair, Toshiharu Saiki (Keio University)

13:05 – 13:10 **Opening Speech** General Chair, Noboru Yamada

Session 1. Properties, structure and fabrication of phase change materials 1

Session Chairs: Toshiharu Saiki (Keio University)
Masashi Kuwahara (AIST)

13:10 – 13:35 (Invited)

1. Electronic structure, transport, and phase change in Cu_2GeTe_3

Keisuke Kobayashi
Materials Sciences Research Center, Japan Atomic Energy Agency and Research institute, Kouchi University of technology

13:35 – 14:00 (Invited)

2. A combined x-ray absorption and ab-initio study of the local structure of Ga_2Te_3, a phase-change alloy without resonant bonding

P. Fons1,2, A.V. Kolobov1, M. Krbal3, K. Mitrovanov1, J. Tominaga1, and T. Uruga2
1 National Institute of Advanced Industrial Science and Technology
2 Japan Synchrotron Radiation Research Institute, SPring-8
3 Faculty of Chemical Technology, University of Pardubice

14:00 – 14:25 (Invited)

3. Low-power consumption optical switches using phase-change material for a large capacity photonic network system

Hiroyuki Tsuda1, Fumi Nakamura1, Kentaro Kato1, Masashi Kuwahara2, Hitoshi Kawashima2, and Tohru Tsuruoka3
1 Keio University
2 National Institute of Advanced Industrial Science and Technology
3 National Institute for Materials Science

14:25 – 14:35 **Coffee Break**

Session 2. Properties, structure and fabrication of phase change materials 2

Session Chairs: Yuji Sutou (Tohoku University)
Rie Endo (Tokyo Institute of Technology)

14:35 – 15:00 (Invited)

4. Deposition induced spontaneous nanostructure formation at room temperature

Toshihiro Nakaoka and Yusuke Imanishi
Faculty of Science and Technology, Sophia University

15:00 – 15:25 (Invited)

5. Study on Structural Transformation in In_2O_3-based Oxide Thin Films

Junjun Jia and Yuzo Shigesato
Graduate School of Science and Engineering, Aoyama Gakuin University

15:25 – 15:50 (Invited)

6. Film structure evolution during metal-metal hydride phase transformation: *in-situ* diffraction study on (111) textured Pd films

Takashi Harumoto, Ji Shi and Yoshio Nakamura
Department of Materials Science and Engineering, Tokyo Institute of Technology

15:50 – 16:00 **Coffee Break**
16:00 – 16:20 **Short presentations by poster presenters (each 2 min.)**
16:20 – 17:30 **Poster Session**
19:00 – 21:00 **Reception**

November 17th (Friday), 2017

Session 3. Phononic properties, energy conversion

Session Chairs: Toshiharu Saiki (Keio University)
Takashi Yagi (AIST)

9:00 – 9:50 (Special)

7. Thermal conduction control in Si membrane by phonon engineering

M. Nomura1,2, J. Maire1, A. Roman1, A. Ramiere1, R. Yanagisawa1, and S. Volz1
1 Institute of Industrial Science, the University of Tokyo
2 PRESTO, Japan Science and Technology Agency

9:50 – 10:15(Invited)

8. Recent Trends in Research on Cubic GeSbTe System as Thermoelectric Materials

Atsuko Kosuga
Graduate School of Science, Osaka Prefecture University

10:15 – 10:40(Invited)

9. Ultrafast coherent phenomena in topological phase-change materials

Muneaki Hase
Division of Applied Physics, Faculty of Pure and Applied Sciences, University of Tsukuba

10:40 – 10:50 **Coffee Break**

Session 4. Memory 1

Session Chairs: Toshimichi Shintani
Keiichiro Yusu (Toshiba Corp.)

10:50 – 11:15 (Invited)

10. Heterogeneous Storage with Storage Class Memories and NAND Flash Memory for Big and Fast

Data Processing

Chihiro Matsui and Ken Takeuchi
Department of Electrical, Electronic, and Communication Engineering, Chuo University

11:15 – 11:40 (Invited)

11. Multi-level switching in GeTe/Sb_2Te_3 based iPCM

Kirill V. Mitrofanov1, Yuta Saito1,2, Noriyuki Miyata1, Paul Fons1, Alexander V. Kolobov1, and Junji Tominaga1
1 Nanoelectronics Research Institute, National Institute of Advanced Industrial Science and Technology (AIST)
2 Department of Engineering, Cambridge University

11:40 – 13:30 **Group Photo and Lunch Break**

Session 5. Memory 2

Session Chairs: Noboru Yamada
Yuta Saito (AIST)

13:30 – 13:55 (Invited)

12. Interfacial properties of Electrodes/$GeCu_2Te_3$ phase change material

Satoshi Shindo1, Yuji Sutou1, Junichi Koike1, Jun-seop An2, Yun-Heub Song2, Yuta Saito3, Paul Fons3, Keisuke Kobayashi3
1 Dept. of Materials Science, Tohoku University
2 Department of Electronics Computer Engineering, Hanyang University
3 Nanoelectronics Research Institute, AIST
4 SPring-8/JASRI

13:55 – 14:15

13. Inverse resistance switching behavior of $Cr_2Ge_2Te_6$-based PCRAM

Shogo Hatayama, Satoshi Shindo, Yuji Sutou, and Junichi Koike
Dept. of Material Science, Tohoku University

14:15 – 14:25 **Coffee Break**

Session 6. Application of phase change materials

Session Chairs: Masashi Kuwahara (AIST)
Rie Endo (Tokyo Institute of Technology)

14:25 – 14:50 (Invited)

14. Active-controlled plasmonic waveguides using GeSbTe superlattice

Atsushi Kubo1, Takeru Sugiyama1, and Takashi Nakano2
1 Division of Physics, Graduate School of Pure and Applied Sciences, Univ. of Tsukuba
2 Nanoelectronics Research Institute, National Institute of Advanced Industrial Science and Technology (AIST)

14:50 – 15:15 (Invited)

15. Terahertz studies in Ge-Sb-Te phase change memory materials and potential terahertz applications

K. Makino1, K. Kato2, K. Takano2, Y. Saito1, J. Tominaga1, G. Isoyama3, M. Nakajima2, and T. Nakano1

1 Nanoelectronics Research Institute, National Institute of Advanced Industrial Science and Technology (AIST)
2 Institute of Laser Engineering (ILE), Osaka University
3 Institute of Scientific and Industrial Research (ISIR), Osaka University

15:15 – 15:40 (Invited)

16. Ab initio calculation of optical properties change of antimonide due to the melting

H. Sano1, M. Kuwahara2, and G. Mizutani3
1 Department of General Education, National Institute of Technology, Ishikawa College
2 Electronics and Photonics Research Institute, National Institute of Advanced Industrial Science and Technology
3 School of Materials Science, Japan Advanced Institute of Science and Technology

15:40 – 15:50 **Coffee Break**

15:50 – 15:55	**Closing Remarks**	Symposium Co-chair, Toshiharu Saiki (Keio University)
15:55 – 16:00	**Best Paper Award**	General Chair, General Chair, Noboru Yamada

Poster Session November 16th (Thursday)

16:00 – 16:20 **Short presentations by poster presenters (each 2 min.)**

16:20 – 17:30 **Poster Session**

1. Fano resonance in topological insulators revealed by coherent phonon spectroscopy

Richarj Mondal1*, Akira Arai1, Yuta Saito2, Paul Fons2, Alexander V. Kolobov2, Junji Tominaga2 & Muneaki Hase1,2

1 Division of Applied Physics, Faculty of Pure and Applied Sciences, University of Tsukuba

2 Nanoelectronics Research Institute, National Institute of Advanced Industrial Science and Technology

2. Optical modulator driven by electrical pulse-induced phase transition of $[(GeTe)_2/(Sb_2Te_3)_1]_{20}$ superlattice

Takeru Sugiyama1, Atsushi Kubo1 and Takashi Nakano2

1 Department of Physics, Univ. of Tsukuba

2 Nanoelectronics Research Institute, National Institute of Advanced Industrial Science and Technology (AIST)

3. Current driven optical gate switch using a $Ge_2Sb_2Te_5$ thin film and an indium tin oxide heater

Fumi Nakamura1, Kentaro Kato1, Masashi Kuwahara2, Hitoshi Kawashima2, Tohru Tsuruoka3, and Hiroyuki Tsuda1

1 Graduate School of Science and Technology, Keio University

2 National Institute of Advanced Industrial Science and Technology

3 International Center for Materials Nanoarchitectonics, National Institute for Materials Science

4. Effects of Nitrogen doping on the properties of Cr-Ge-Te ternary compound film

Yi Shuang, Shogo Hatayama, Satoshi Shindo, Daisuke Ando, Yuji Sutou, Junichi Koike

Dept. of Materials Science, Sch. of Engineering, Tohoku University

5. GeTe nanowire growth on Ag nanoparticles

Kazuki Nakaya, Toshihiro Nakaoka

Faculty of Science and Technology, Sophia University

6. Exploring the iPCM Structure using Coherent Folded Acoustic Phonons

Takara Suzuki1, Yuta Saito2, Paul Fons2, Alexander V. Kolobov2, Junji Tominaga2, and Muneaki Hase1

1 Division of Applied Physics, Faculty of Pure and Applied Science, University of Tsukuba

2 Nanoelectronics Research Institute, National Institute of Advanced Industrial Science and Technology

7. Hydrodynamics of Active Colloids on GeSbTe Substrate Induced by Laser Heating

Kei Yamaguchi1, Eiji Yamamoto1, Ryo Soma1, Bokusui Nakayama1, Masashi Kuwahara2, Toshiharu Saiki1

1 Keio University.

2 National Institute of Advanced Industrial Science and Technology2

8. Optical Control of Translocation Dynamics through Nanopore with $Ge_2Sb_2Te_5$ Thin Film

Takaha Mizuguchi1 Hirohito Yamazaki1 Masashi Kuwahara2 and Toshiharu Saiki1
1 Graduate School of Science and Technology, Keio University
2 Electronics and Photonics Research Institute, National Institute of Advanced Industrial Science and Technology

9. Diffusive behavior of GeSbTe coated Janus particles

Eiji Yamamoto1, Ryo Soma2, Kei Yamaguchi1, Bokusui Nakayama2, Masashi Kuwahara3, and Toshiharu Saiki2
1 Graduate School of Science and Technology, Keio University
2 Department of Electronics and Electrical Engineering, Keio University
3 National Institute of Advanced Industrial Science and Technology (AIST)