

PCOS 2023 TECHNICAL PROGRAM

November 16th (Thursday), 2023

13:00 – 13:05 **Opening Remark:** Symposium Co-chair, Takashi Harumoto (*Tokyo Institute of Technology*)

Session 1

Session Chairs: Keiichiro Yusu (*Japan Science and Technology Agency*)
Toshimichi Shintani (*National Institute of Advanced Industrial Science and Technology*)

13:05 – 13:40 (Invited)

1. Beyond p-electron-type chalcogenide materials

Shogo Hatayama
National Institute of Advanced Industrial Science and Technology

Session 2 Poster Session

Session Chairs: Masashi Kuwahara (*National Institute of Advanced Industrial Science and Technology*)
Yuji Sutou (*Tohoku University*)

13:40 – 15:40

P1. Structural phase transition of resonantly bonded crystals induced by fs-laser irradiation

Yohei Kaise¹, Hiroshi Tanimura¹, Yuji Sutou² and Tetsu Ichitsubo¹
¹*Institute of Materials Research, Tohoku University*
²*Department of Material Science, Graduate School of Engineering, Tohoku University*

P2. Ultrafast optical response of Peierls-distorted Nb_{1-x}Ti_xO₂

Takumi Nakajima¹, Hiroshi Tanimura¹, Akihiro Ishii², Hitoshi Takamura², Yuji Sutou² and Tetsu Ichitsubo¹
¹*Institute of Materials Research, Tohoku University*
²*Department of Materials Science, Graduate School of Engineering, Tohoku University*

P3. The physical properties of MnTe₂ films prepared by RF magnetron sputtering

Li, Shih-yuan¹, Yi Shuang², Daisuke Ando¹ & Yuji Sutou^{1,2}
¹*Department of Materials Science and Engineering, Tohoku University*
²*Advanced Institute for Materials Research, Tohoku University*

P4. Electrical response of CrTe₃ thin film in vibration mode

Rikuto Yoshida¹, Wang Yinli¹, Yi Shuang², Daisuke Ando¹, and Yuji Sutou^{1,2}
¹*Graduate School of Engineering, Tohoku university*
²*Advanced Institute for Materials Research*

P5. Magnetic Properties of β -MnTe Thin Films

R. Nakajima¹, N. Fuchigami¹, M. Kim², T. Harumoto¹, Y. Sutou^{2,3}, J. Shi¹
¹*Department of Materials Science and Engineering, School of Materials and Chemical Technology, Tokyo Institute of Technology*
²*Department of Materials Science, Graduate School of Engineering, Tohoku University*
³*Advanced Institute for Materials Research, Tohoku University*

P6. Improved thermal stability of amorphous Si-Te by Mn doping for As- and Se-free Ovonic threshold switch material

Kentaro Saito, Shogo Hatayama, and Yuta Saito

Device Technology Research Institute, National Institute of Advanced Industrial Science and Technology

P7. Effect of transition-metal doping on the thermal stability of Ge-Te alloy films for As/Se-free selector applications

Keisuke Hamano^{1,2}, Eisuke Takeuchi¹, Shogo Hatayama², Yuta Saito², and Paul Fons¹

¹*Department of Electrical and Electronic Engineering, Keio University*

²*Device Technology Research Institute, National Institute of Advanced Industrial Science and Technology*

P8. Effect of crystallization of GST on IMT of VO₂ in GST/VO₂ layered structure (II)

- Comparison between TiO₂ (001) and Al₂O₃ (001) substrates -

Takuto Ohnuki¹, Kunio Okimura¹, Reki Nakamoto², Yuji Muraoka³, Joe Sakai⁴ and Masashi Kuwahara⁵

¹*Graduate School of Engineering, Tokai Univ.*

²*Graduate School of Natural Science and Technology, Okayama Univ.*

³*Okayama Univ. RIIS*

⁴*Toshima Manufacturing Co., Ltd.*

⁵*National Institute of Advanced Industrial Science and Technology*

P9. Focusing of microparticles in fluid by induced-charge electroosmosis flow using a phase-change material

Shota Eto¹, Kotaro Makino², Shogo Hatayama², Yuta Saito², and Toshiharu Saiki¹

¹*Graduate School of Science and Technology, Keio University*

²*Device Technology Research Institute, National Institute of Advanced Industrial Science and Technology*

P10. Observation and simulation of Janus particle population motion implementing pheromone interactions

Hikaru Nagase, Bokusui Nakayama, Toshiharu Saiki, Yuta Saito, Shogo Hatayama, Kotaro Makino
Keio University

15:40 – 15:55 **Short Break**

Session 3

Session Chairs: Yuta Saito (*Tohoku University*)

Takashi Yagi (*National Institute of Advanced Industrial Science and Technology*)

15:55 – 16:30 (Invited)

2. Non-volatile optical devices based on Ge₂Sb₂Te₃S₂ on Si photonics platform for computing applications

M. Takenaka¹, Y. Miyatake¹, R. Tang¹, K. Makino², J. Tominaga², N. Miyata², M. Okano², K. Toprasertpong¹, and S. Takagi¹

¹*The University of Tokyo*

²*National Institute of Advanced Industrial Science and Technology (AIST)*

16:30 – 17:05 (Invited)

3. Towards silicon based thermoelectric energy harvesting

Masahiro Nomura

Institute of Industrial Science, The University of Tokyo

17:05 – 17:40 (Invited)

4. Neuromorphic System using Memristor Array

- Application Example of Phase-Change Memory using Cu₂GeTe₃ -

Mutsumi Kimura^{1,2}, Shihori Akane¹, Isao Horiuchi³, Yasushi Hiroshima³, and Yasuhiko Nakashima²

¹Ryukoku University

²NAIST

³KOA Corporation

November 17th (Friday), 2023

Session 4

Session Chairs: Toshiharu Saiki (Keio University)
Hiroshi Tanimura (Tohoku University)

9:00 – 9:35 (Invited)

5. Transition-metal chalcogenides for phase-change materials

Yuji Sutou^{1,2}

¹Department of Material Science, Graduate School of Engineering, Tohoku University

²Advanced Institute for Materials Research, Tohoku University

9:35 – 10:10 (Invited)

6. Collective excitations in melts of fast phase change materials

GeCu₂Te₃ and Ge₂Sb₂Te₅

Masanori Inui

Graduate School of Advanced Science and Engineering, Hiroshima University

10:10 – 10:30

7. NbTe₄: A Promising 2D van der Waals Transition-metal Binary Chalcogenides for phase change memory

Yi Shuang¹, Qian Chen^{2,3}, Mihyeon Kim⁴, Yinli Wang⁴, Yuta Saito⁵, Shogo Hatayama⁵, Paul Fons⁶,
Daisuke Ando⁴, Momoji Kubo^{2,3}, Yuji Sutou^{1,4}

¹WPI Advanced Institute for Materials Research, Tohoku University

²New Industry Creation Hatchery Center, Tohoku University

³Institute for Materials Research, Tohoku University

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

⁵Device Technology Research Institute, National Institute of Advanced Industrial Science and Technology (AIST)

⁶Department of Electronics and Electrical Engineering, Faculty of Science and Technology, Keio University

10:30 – 10:45 **Short Break**

Session 5

Session Chairs: Takashi Harumoto (Tokyo Institute of Technology)
Takashi Yagi (National Institute of Advanced Industrial Science and Technology)

10:45 – 11:20 (Invited)

8. Density-functional theory study of the thermodynamic and Dynamic Properties of the stable and metastable phases of MnTe

Paul Fons, Keisuke Hamano, Toshiharu Saiki, Hiroyuki Tsuda

Department of Electrical and Electronic Engineering, Keio University

11:20 – 11:40

9. Electrical changes in polymorphic Cr-Mn-Te ternary thin film

Mihyeon Kim¹, Yi Shuang², Daisuke Ando¹, and Yuji Sutou^{1,2}

¹Department of Material Science, Graduate School of Engineering, Tohoku University

²Advanced Institute for Materials Research, Tohoku University

Taking group photos in the Conference Room

11:40 – 13:10 **Lunch Break**

Session 6

Session Chairs: Keiichiro Yusu (*Japan Science and Technology Agency*)
Masashi Kuwahara (*National Institute of Advanced Industrial Science and Technology*)

13:10 – 13:45 (Invited)

10. Design of 2D–3D structural switching material for giant physical property modulation

Takayoshi Katase

MDX Research Center for Element Strategy, International Research Frontiers Initiative, Tokyo Institute of Technology

13:45 – 14:20 (Invited)

11. Self-adaptive control of infrared emissivity based on VO₂ for tunable radiative cooling

Masashi Ono

AGC Inc.

14:20 – 14:40

12. Electrical response in Cr₂Ge₂Te₆ film under tensile force

Yinli Wang¹, Yi Shuang², Mayu Nakajima¹, Daisuke Ando¹, Fumio Narita³, Yuji Sutou^{1,2}

¹*Tohoku Univ. (Eng.)*

²*AIMR*

³*Tohoku Univ. (Env.)*

14:40 – 14:55 **Short Break**

* **Removal of posters**

Session 7

Session Chairs: Hiroshi Tanimura (*Tohoku University*)
Toshimichi Shintani (*National Institute of Advanced Industrial Science and Technology*)

14:55 – 15:15

13. Crystallization Kinetics in Si-GeTe: A Pathway to Optimized Synaptic Functions

Shinyoung Kang¹, Mihyeon Kim¹, Shuang Yi^{1,2}, Daisuke Ando¹, Yuji Sutou¹

¹*Department of Materials Science, Tohoku University*

²*WPI Advanced Institute for Materials Research, Tohoku University*

15:15 – 15:50 (Invited)

14. Localized levels of amorphous chalcogenide films evaluated by infrared photothermal deflection spectroscopy

Tamihiro Gotoh

Graduate School of Science and Technology, Gunma University

15:50 – 16:25 (Invited)

15. Phase-change-assisted Stigmergy in an Active Colloidal System

Bokusui Nakayama¹, Hikaru Nagase², Hiromori Takahashi², Yuta Saito³, Shogo Hatayama³, Kotaro Makino³, Eiji Yamamoto², Masatoshi Ichikawa¹, Akira Kakugo¹ and Toshiharu Saiki²

¹*Graduate School of Science, Kyoto University*

²*Graduate School of Science and Technology, Keio University*

³*Device Technology Research Institute, AIST*

16:25 - 16:30 **Closing Remark:** Symposium Co-chair, Toshimichi Shintani (National Institute of Advanced Industrial Science and Technology)