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### SHORT STATEMENT

The International Thermoelectric Society (ITS) has been leading the world as the largest and highest-level society in the field of thermoelectric science and technology. As a university professor, I would like to contribute ITS in the following ways. For further motivating young researchers (students), I wish to facilitate mutual visits and short-term study programs between different research groups, as well as the current various awarding systems. While face-to-face interactions are most effective, I also want to provide new platforms for young researchers to present their work more frequently in the world-wide level, given the prevalence of remote meetings in recent times. To achieve these goals, funding is necessary. Thus, I plan to widen a system for accepting donations from the public and corporations to further support the society's activities. Additionally, I believe it is important to explore new applications for thermoelectric technology in collaboration with industry to attract wider interest.

### RESEARCH INTEREST

I have been a member of the thermoelectric community since 1999, and published more than 100 peer reviewed papers. My way of doing research is based on the deep understanding of the crystal structure of target materials, through X-ray and/or neutron diffraction techniques. Up to now, we have revealed precise crystal structures of misfit-layered cobalt oxides  $[\text{Ca}_2\text{CoO}_3]_p\text{CoO}_2$  (known as  $\text{Ca}_3\text{Co}_4\text{O}_9$ ) and  $[\text{Ca}_2(\text{Co,Cu})_2\text{O}_4]_p\text{CoO}_2$ , incommensurate cobalt oxides,  $(\text{Na, Ca, Sr})_x\text{CoO}_2$ , higher manganese silicides  $\text{MnSi}_y$ , half-Heusler  $\text{VFeSb}$ ,  $\text{Mg}_2(\text{Si, Ge, Sn})$  and so on, and further optimised electronic and nano/micro structures and enhanced their thermoelectric properties.

### SHORT VITA

1989 M. Eng., Department of Materials Processing, School of Engineering, Tohoku University

1989-1991 Engineer, Honda Motor R&D

1994 D. Eng., Department of Materials Science, Graduate School of Engineering, Tohoku University

1994-2004 Assistant professor, Graduate School of Engineering, Tohoku University

1997-1999 JSPS PostDoc Fellow, School of Chemistry, University of Birmingham, UK

2004-2012 Associate Professor, Graduate School of Engineering, Tohoku University

2012-present Professor, Graduate School of Engineering, Tohoku University

I am currently a member of ITS, Thermoelectrics Society of Japan (TSJ, vice president, board member), Japan Society of Applied Physics (JSAP, vice president of Tohoku chapter, board member) and Japan Institute of Metals and Materials. Selected awards are Honda Memorial Young Researcher Award (1995), Harada Young Research Award (2005), Tanaka Holdings MMS Award (2016) and TSJ Academic Award (2018). I will also serve as **Co-chair of ICT 2025 Sendai**.

## 10 SELECTED PAPERS (YUZURU MIYAZAKI)

- (1) Y. Miyazaki, K. Kudo, M. Akoshima, Y. Ono, Y. Koike, T. Kajitani, “Low-Temperature Thermoelectric Properties of the Composite Crystal  $[\text{Ca}_2\text{CoO}_{3.34}]_{0.614}[\text{CoO}_2]$ ”, *Jpn. J. Appl. Phys.*, **39** (2000) L531.
- (2) Y. Miyazaki, T. Kajitani, “Preparation of  $\text{Bi}_2\text{Te}_3$  films by electrodeposition”, *J. Cryst. Growth*, **229** (2001) 542.
- (3) Y. Miyazaki, M. Onoda, T. Oku, M. Kikuchi, Y. Ishii, Y. Ono, Y. Morii, T. Kajitani, “Modulated Structure of the Thermoelectric Compound  $[\text{Ca}_2\text{CoO}_3]_{0.62}\text{CoO}_2$ ”, *J. Phys. Soc. Jpn.*, **71** (2002) 491.
- (4) Y. Miyazaki, “Crystal structure and thermoelectric properties of the misfit-layered cobalt oxides”, *Solid State Ionics*, **172/1-4** (2004) 463.
- (5) Y. Miyazaki, D. Igarashi, K. Hayashi, T. Kajitani, K. Yubuta, “Modulated crystal structure of chimney-ladder higher manganese silicide  $\text{MnSi}_\gamma$  ( $\gamma \sim 1.74$ )”, *Phys. Rev. B*, **78** (2008) 214104.
- (6) Y. Kikuchi, T. Nakajo, K. Hayashi, Y. Miyazaki, “High temperature X-ray diffraction study on incommensurate composite crystal  $\text{MnSi}_\gamma$  - (3+1)-dimensional superspace approach”, *J. Alloys Compd.*, **616** (2014) 263.
- (7) T. Kanno, H. Tamaki, H. K. Sato, S. D. Kang, S. Ohno, K. Imasato, J. J. Kuo, G. J. Snyder, Y. Miyazaki, “Enhancement of average thermoelectric figure of merit by increasing the grain-size of  $\text{Mg}_{3.2}\text{Sb}_{1.5}\text{Bi}_{0.49}\text{Te}_{0.01}$ ”, *Appl. Phys. Lett.*, **112** (2018) 033903.
- (8) J. Dong, F.-H. Sun, H. Tang, K. Hayashi, H. Li, P.-P. Shang, Y. Miyazaki, J.-F. Li, “Reducing Lattice Thermal Conductivity of  $\text{MnTe}$  by Se Alloying toward High Thermoelectric Performance”, *ACS Appl. Mater. Interfaces*, **11** (2019) 28221.
- (9) W. Saito, K. Hayashi, Z. Huang, J. Dong, J. F. Li, Y. Miyazaki, “Enhancing the Thermoelectric Performance of  $\text{Mg}_2\text{Sn}$  Single Crystals via Point Defect Engineering and Sb Doping”, *ACS Appl. Mater. Interfaces*, **12** (2020) 57888.
- (10) Y. Huang, K. Hayashi, Y. Miyazaki, “Outstanding thermoelectric performance of n-type half-Heusler  $\text{V}(\text{Fe}_{1-x}\text{Co}_x)\text{Sb}$  compounds at room-temperature”, *Acta Mater.*, **215** (2021) 117022.