

## Tiejun ZHU, School of Materials Science and Engineering, Zhejiang University, China

### Statement

I am a professor with Zhejiang University, China. I have been working in the field of thermoelectric materials and devices for 28 years. My research has mainly focused on the development of high-performance half-Heusler compounds, bismuth tellurides, Mg-based materials, and their devices. In recent years, my group has been dedicated to p-type heavily doped NbFeSb with record-high performance and underlying transport mechanisms, which have been used to assemble high-efficiency thermoelectric modules. We have also found high-performance cation-deficient half-Heusler compounds ( $\text{Nb}_{1-\delta}\text{CoSb}$ ,  $\text{V}_{1-\delta}\text{CoSb}$ ,  $\text{Ti}_{1-\delta}\text{NiSb}$ , etc.) and first discovered the short-range order of massive vacancies and diffuse bands. I have published more than 300 peer-reviewed papers (total citation >21000, H-index 78). I have given more than 40 invited talks in thermoelectrics-related conferences. In addition, I have been actively involved in organizing thermoelectric conferences or symposia to promote the communication of thermoelectricians, such as the Thermoelectric Symposium of TMS Annual Meeting & exhibitions (2018-2021), Chinese Thermoelectric Conference (2018, 2021), Thermoelectric Symposium of International Conference on Functional Materials (2022) and so on. I am now the editor of *Materials Today Electronics*, *The Innovation Materials*, *Journal of Materials Science*, and have served as the guest editor in the special issues on thermoelectric materials in the journals of *Small Science*, *Annalen der Physik*, *Rare Metals*, and *Inorganic Materials*. I am now serving as the vice president of the Chinese Thermoelectric Society and will be more than happy to do more to promote the worldwide development of thermoelectric fundamental research and application technology.

### Selected publications

1. Shen Han, Shengnan Dai, Jie Ma, Qingyong Ren, Chaoliang Hu, Ziheng Gao, Manh Duc Le, Denis Sheptyakov, Ping Miao, Shuki Torii, Takashi Kamiyama, Claudia Felser, Jiong Yang\*, Chenguang Fu\*, **Tiejun Zhu\***, Strong phonon softening and avoided crossing in aliovalence-doped heavy-band thermoelectrics, *Nature Physics*, 11, 1649-1657 (2023).
2. Airan Li, Yuechu Wang, Yuzheng Li, Xinlei Yang, Pengfei Nan, Kai Liu, Binghui Ge, Chenguang Fu\*, **Tiejun Zhu\***, High performance magnesium-based plastic semiconductors for flexible thermoelectrics, *Nature Communications*, 15, 5108 (2024).
3. Airan Li, Chaoliang Hu, Bin He, Mengyu Yao, Chenguang Fu\*, Yuechu Wang, Xinbing Zhao, Claudia Felser, **Tiejun Zhu\***, Demonstration of valley anisotropy utilized to enhance the thermoelectric power factor, *Nature communications*, 12 (1), 5408 (2021).
4. Chenguang Fu, Shengqiang Bai, Yintu Liu, Yunshan Tang, Lidong Chen\*, Xinbing Zhao, **Tiejun Zhu\***, Realizing high figure of merit in heavy-band p-type half-Heusler thermoelectric materials. *Nature Communications*, 6, 8144 (2015).
5. **Tiejun Zhu\***, Yintu Liu, Chenguang Fu, Joseph P. Heremans, Jeffrey G. Snyder, and Xinbing Zhao\* Compromise and Synergy in High Efficiency Thermoelectric Materials, *Advanced Materials*, 1605883 (2017).
6. Chenguang Fu, **Tiejun Zhu\***, Yintu Liu, Hanhui Xie, Xinbing Zhao, Band engineering of high performance p-type FeNbSb based half-Heusler thermoelectric materials for figure of merit  $zT > 1$ . *Energy & Environmental Science*, 8, 201-216 (2015).



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### APPOINTMENT

2021 - Present	<b>Dean</b> School of Materials Science and Engineering, Zhejiang University, China
2018 - Present	<b>ZJU Qiushi Distinguished Professor</b> School of Materials Science and Engineering, Zhejiang University, China
2011 – 2018	<b>Professor</b> School of Materials Science and Engineering, Zhejiang University, China
2011.9 – 2012.3	<b>Visiting Professor</b> Applied Physics and Materials Science, California Institute of Technology, USA
2004 – 2010	<b>Associate Professor</b> School of Materials Science and Engineering, Zhejiang University, China
2002 – 2004	<b>Research Fellow</b> Advanced Materials for Micro- and Nano-System (AMM&NS) Program Singapore-MIT Alliance, National University of Singapore, Singapore

### INVITED TALKS (selected)

2023.11	The Real Origin of Donor-like Effect in Bismuth-Telluride-Based Thermoelectric (Keynote) PACRIM 15 <sup>th</sup> & CICC 13 <sup>th</sup> , Shenzhen, China
2023.03	Structure and transport properties for typical thermoelectric materials (Plenary) 14 <sup>th</sup> China Conference on Thermoelectric Materials and Applications, Tongxiang, China
2019.06	Defective Half-Heusler Thermoelectric Compounds with Intrinsic Vacancies ICT/ACT 2019, Gyeongju, Korea
2019.05	Defective Half-Heusler Thermoelectric Compounds with Intrinsic Vacancies The 2019 E-MRS Spring Meeting, Nice, France
2017.08	Continuous efforts towards high performance half-Heusler thermoelectric materials International Conference on Advanced Materials 2017 (IUMRS-ICAM2017), Kyoto, Japan
2016.05	Design and optimization of high-performance p-type half-Heusler thermoelectric materials 35 <sup>th</sup> International Conference on Thermoelectrics (ICT2016), Wuhan, China
2015.06	Towards high figure of merit $zT > 1$ for p-type FeNbSb half-Heusler thermoelectric materials ICT2015 & ECT2015, Dresden, Germany
2014.07	Point defect engineering of high performance thermoelectric materials 33 <sup>rd</sup> International Conference on Thermoelectrics (ICT2014), Nashville, Tennessee, USA
2010.11	Fabrication, microstructure and properties of half-Heusler thermoelectric materials 2010 MRS Fall Meeting, Boston, Massachusetts, USA