

Woochul Kim

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Short statement:

As a mechanical engineer who has been working on thermal transport in nanostructured thermoelectric materials since 2001, I would like to contribute the International Thermoelectric Society (ITS) in the following way. During the last few decades, there has been tremendous progress in *zT*. I believe that now is a high time to launch innovative products out of TE materials. While we should be continuously working on enhancing *zT*s of materials, I would like to bring more system engineers to ITS so that we could produce innovative products into market from existing high *zT* materials. This would lead to increase in world-wide attention to our thermoelectric community.

Education:

- Ph.D., Mechanical Engineering, University of California, Berkeley, 2005
  Advisor: Prof. Arun Majumdar
- M.S., Mechanical Engineering, Purdue University, 2001
- B.S., Mechanical Engineering, Yonsei University, Korea, 1998

Work experience:

- Head, School of Mechanical Engineering, 2024.03. – Present
- Director, Pioneer Research Center, supported by the ministry of science & ICT, 2022.08. – Present
- Principal Investigator, Basic Research Laboratory, supported by the ministry of science & ICT, 2021.06. – Present
- Visiting Researcher, 2022.03. – 2023.02.
  Samsung Advanced Institute of Technology
- Associate Dean for Research, 2020.03. – 2022.02.
  Yonsei University, College of Engineering
- Principal Investigator, National Leading Research Laboratory, supported by the ministry of education, science & technology, 2011.09. – 2016.08.
- LG Innotek consulting professor, LG Innotek, 2015.01. – 2015.12.
- Visiting Researcher, Center for Energy Efficient Materials, University of California, Santa Barbara, 2013.01. – 2013.12.

Awards:

- Minister's Award from the Ministry of SMEs and Startups, Commendation for Meritorious Contributors at the 2024 Seoul SME Conference, 2024.06.
- Achievement Excellence Award, Yonsei University, 2024.02., 2020.02., 2016.02, 2013.01.
- Best Engineering Professor Award, Yonsei University College of Engineering, 2023.04.

- Prime Minister's Award in Nanotechnology Research Innovation, 2017 NANO KOREA Awards, 2017.07.
- Teaching Excellence Award, Yonsei University, 2016.08., 2012.02., 2008.03.
- Netzsch KSTP TPP Award, The Korean Society of Thermophysical Properties, 2015.08.
- KSME Young Investigator Award in Thermal Engineering, The Korean Society of Mechanical Engineers, 2013.05.
- KSTP Research Excellence Award, The Korean Society of Thermophysical Properties, 2013.04.
- LG Yonam Overseas Research Professor, LG Yonam Culture Foundation, 2012.06.

Selected publications:

1. S. Khan, J. Kim, T. Kang, G. Park, S. Lee, J. Park*, W. Kim*, "Compact vital-sensing band with uninterrupted power supply for core body temperature and pulse rate monitoring," *ACS Sensors* **9**, 5885 (2024).
2. J. Kim, S. Khan, E. K. Kim, H. Kil, B. M. Kang, H. G. Lee, J. Park, J. Y. Yoon*, W. Kim*, "A true continuous healthcare system for type 1 diabetes," *Nano Energy* **113**, 108553 (2023).
3. S. Acharya, J. Hwang, K. Kim, J. Kim, W. Hwang, A. Soon*, W. Kim*, "Quasi-random distribution of distorted nanostructures enhances thermoelectric performance of high-entropy chalcopyrite," *Nano Energy* **112**, 108493 (2023).
4. G. Park, J. Kim, S. Woo, J. Yu, S. Khan, S. K. Kim, H. Lee, S. Lee, B. Kwon, W. Kim*, "Modeling heat transfer in humans for body heat harvesting and personal thermal management," *Applied Energy* **323**, 119609 (2022).
5. S. Khan, J. Kim, K. Roh, G. Park, W. Kim*, "High power density of radiative-cooled compact thermoelectric generator based on body heat harvesting," *Nano Energy* **87**, 106180 (2021).
6. S. Acharya, B. Yu, J. Hwang, J. Kim, W. Kim*, "High thermoelectric performance of ZnO by coherent phonon scattering and optimized charge transport," *Advanced Functional Materials* **31**, 2105008 (2021).
7. H. Kim, G. Park, S. Park, W. Kim*, "Strategies for manipulating phonon transport in solids," *ACS Nano* **15**, 2182 (2021).
8. J. Kim, S. Khan, P. Wu, S. Park, H. Park, C. Yu*, W. Kim*, "Self-charging wearables for continuous health monitoring," *Nano Energy* **79**, 105419 (2021).
9. H. Wang, J. Bahk, C. Kang, J. Hwang, K. Kim, J. Kim, P. Burke, J. Bowers, A. Gossard, A. Shakouri, W. Kim*, "Right sizes of nano- and microstructures for high performance and rigid bulk thermoelectrics," *Proceedings of the National Academy of Sciences of the United States of America* **111**, 10949 (2014)
10. J. W. Roh, K. Hippalgaonkar, J. H. Ham, R. Chen, M. Z. Li, P. Ercius, A. Majumdar, W. Kim*, W. Lee*, "Observation of anisotropy in thermal conductivity of individual single-crystalline bismuth nanowires," *ACS Nano* **5**, 3954 (2011).
11. W. Kim, R. Wang, A. Majumdar*, "Nanostructuring expands thermal limits," *Nano Today* **2**, 40 (2007).
12. W. Kim, J. Zide, A. Gossard, D. Klenov, S. Stemmer, A. Shakouri, A. Majumdar*, "Thermal conductivity reduction and thermoelectric figure of merit increase by embedding nanoparticles in crystalline semiconductors," *Physical Review Letters* **96**, 045901 (2006).
13. W. Kim, A. Majumdar*, "Phonon scattering cross section of polydispersed spherical nanoparticles," *Journal of Applied Physics* **99**, 084306 (2006).