

## Jaeho Lee

Assistant Professor, Henry Samueli Career Development Chair  
Department of Mechanical and Aerospace Engineering  
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## Professional Preparation

Lawrence Berkeley National Lab.	Materials Science Div.	Post-Doc, 2015
Stanford University	Mechanical Engineering	Ph.D., 2012
Stanford University	Electrical Engineering	Ph.D. Minor, 2012
Stanford University	Mechanical Engineering	M.S., 2009
Georgia Institute of Technology	Mechanical Engineering	B.S., 2007

## Appointments

Apr. 2015 – Present	Assistant Professor, Mechanical and Aerospace Eng., UCI
Sep. 2016 – Sep. 2018	Affiliated Professor, Chemical Eng. and Materials Sci., UCI
Jun. 2016 – Sep. 2016	JPL Summer Faculty Research Program, Jet Propulsion Laboratory
Dec. 2012 – Mar. 2015	Materials Postdoc Fellow, Lawrence Berkeley National Laboratory
Sep. 2012 – Nov. 2012	Postdoc Researcher, Mechanical Engineering, Stanford University
Jan. 2012 – Aug. 2012	Device Engineer Intern, Nonvolatile Memories, Intel Corporation
Jan. 2009 – Aug. 2012	Graduate Research Assistant, Mechanical Engr., Stanford Univ.
Apr. 2008 – Sep. 2008	Graduate Research Assistant, Radiology, Stanford Univ.

## Journal Publication

- J33. S. Farzinazar, T. A. Schaedler, L. Valdevit, and **J. Lee**, "Thermal Transport in Hollow Metallic Microlattices," *APL Materials* 7, 101108 (2019).
- J32. A. Krishna, J. M. Kim, J. Leem, M. C. Wang, S. Nam, and **J. Lee**, "Ultraviolet to Mid-Infrared Emissivity Control by Mechanically Reconfigurable Graphene," *Nano Letters* 19, 8, 5082-5092 (2019).
- J31. L. Ferrer-Argemi, Z. Yu, and **J. Lee**, "Effects of metal silicide inclusion interface and shape on thermal transport in silicon nanocomposites," *Journal of Applied Physics*, 126, 035106 (2019).
- J30. L. Ferrer-Argemi, Z. Yu, J. Kim, N. V. Myung, J. Lim, and **J. Lee**, "Silver content dependent thermal conductivity and thermoelectric properties of electrodeposited antimony telluride thin films," *Scientific Reports*, 9, 9242 (2019).
- J29. R. Chen, **J. Lee**, W. Lee, and D. Li, "Thermoelectrics of Nanowires," *Chemical Reviews* 119, 15, 9260-9302 (2019).
- J28. M. Sala-Casanovas<sup>†</sup>, A. Krishna<sup>†</sup>, Z. Yu, and **J. Lee**, "Bio-inspired Stretchable Selective Emitters based on Corrugated Nickel for Personal Thermal Management," *Nanoscale and Microscale Thermophysical Engineering*. vol. 23, no. 3, 173–187 (2019).

- J27. Z. Yu, Z. Ren, and **J. Lee**, “Phononic topological insulators based on six-petal holey silicon structures,” *Scientific Reports* 9, 1805 (2019).
- J26. Z. Ren, Z. Yu, J. C. Kim, and **J. Lee**, “TSV-integrated thermoelectric cooling by holey silicon for hot spot thermal management,” *Nanotechnology*, 035201, 2019.
- J25. Q. Zhao, M. W. Khan, S. Farzinazar, **J. Lee**, and O. Boyraz, “Plasmo-Thermomechanical Radiation Detector with On-chip Optical Readout,” *Optics Express*, Vol. 26, Issue 23, pp. 29638-29650 (2018).
- J24. A. Alqahtani, Z. Ren, **J. Lee**, and N. Bagherzadeh, “System Level Analysis of 3D ICs with Thermal TSVs,” *ACM Journal on Emerging Technologies in Computing Systems*, Vol. 14, No. 3, Article 37, 2018
- J23. Z. Yu, L. Ferrer-Argemi, J. Kim, J. Lim, N. V. Myung, and **J. Lee**, “Phase-dependent thermal conductivity of electrodeposited antimony telluride films,” *J. Mater. Chem. C*, 6, 3410 – 3416, 2018.
- J22. A. Krishna, and **J. Lee**, “Morphology-Driven Emissivity of Microscale Tree-like Structures for Radiative Thermal Management,” *Nanoscale and Microscale Thermophysical Engineering*, vol. 22, no. 2, 124–136 (2018).
- J21. L. Ferrer-Argemi, E. S. Aliabadi, A. Cisquella-Serra, A. Salazar, M. Madou, and **J. Lee**, “Size-dependent electrical and thermal conductivities of electro-mechanically-spun glassy carbon wires,” *Carbon* 130, 87-93, 2018.
- J20. Z. Ren, and **J. Lee**, “Thermal conductivity anisotropy in holey silicon nanostructures and its impact on thermoelectric cooling,” *Nanotechnology* 29, 045404, 2018.
- J19. Z. Yu, L. Ferrer-Argemi, and **J. Lee**, “Investigation of thermal conduction in symmetric and asymmetric nanoporous structures,” *Journal of Applied Physics* 122, 244305, 2017.
- J18. Y. Zhou, A. Morshedifard, **J. Lee**, and M.J.A. Qomi, “The contribution of propagons and diffusons in heat transport through calcium-silicate-hydrates,” *Applied Physics Letters* 110, 043104, 2017.
- J17. C. O’Dwyer, R. Chen, J-H He, **J. Lee**, and K. M. Razeeb “Scientific and Technical Challenges in Thermal Transport and Thermoelectric Materials and Devices,” *Journal of Solid State Science and Technology* 6 (3), N3058-N3064, 2017.
- J16. **J. Lee**†, W. Lee†, G. Wehmeyer†, S. Dhuey, D.L. Olynick, S. Cabrini, C. Dames, J. J. Urban, P. Yang, “Investigation of Phonon Coherence and Backscattering using Silicon Nanomeshes,” *Nature Communications*, 14054, 2017.
- J15. **J. Lee**†, W. Lee†, J. Lim†, Y. Yu, Q. Kong, J. J. Urban, P. Yang, “Thermal Transport in Silicon Nanowires at High Temperature up to 700 K,” *Nano Letters* 16, 4133–4140, 2016.
- J14. J. Lim, H. Wang, J. Tang, S. C. Andrews, **J. Lee**, D. Lee, T. P. Russell, P. Yang, “Simultaneous Thermoelectric Property Measurement and Incoherent Phonon Transport in Holey Silicon,” *ACS Nano* 10, 124–132, 2016.
- J13. Shi, L., Dames, C., Likes, J.R., Reddy, P.S., Duda, J., Cahill, D.G., **Lee, J.**, Marconnet, A., Goodson, K.E., Bahk, J.-H., Shakouri, A., Prasher, R.S., Felts, J., King, W.P., Han, B., Bischof, J.C., 2015, “Evaluating Broader Impacts of Nanoscale Thermal Transport Research,” *Nanoscale and Microscale Thermophysical Engineering*, vol. 19, no. 2, 2015.
- J12. **J. Lee**, J. Lim, P. Yang, “Ballistic Phonon Transport in Holey Silicon,” *Nano Letters* 15, 3273–3279, 2015.
- J11. R.G.D. Jeyasingh, S. Fong, **J. Lee**, Z. Li, K.-W. Chang, D. Mantegazza, M. Asheghi, K. E. Goodson, and H.-S. P. Wong, 2012, “Ultrafast Characterization of Phase-Change Material Crystallization Properties in the Melt-Quenched Amorphous Phase,” *Nano Letters*,

nl500940z, 2014.

- J10. **J. Lee**, E. Bozorg-Grayeli, S. Kim, M. Asheghi, H.-S. P. Wong, and K. E. Goodson, "Phonon and Electron Transport through  $\text{Ge}_2\text{Sb}_2\text{Te}_5$  Films and Interfaces Bounded by Metals," *Applied Physics Letters*, 102, 191911, 2013.
- J9. Z. Li, R.G.D. Jeyasingh, **J. Lee**, M. Asheghi, H.-S. P. Wong, and K. E. Goodson, 2012, "Electrothermal Modeling and Design Strategies for Multibit Phase Change Memory," *IEEE Transactions on Electron Devices*, 59, 3561-3567, Dec. 2012.
- J8. **J. Lee**, T. Kodama, Y. Won, M. Asheghi, and K. E. Goodson, "Phase Purity and the Thermoelectric Properties of  $\text{Ge}_2\text{Sb}_2\text{Te}_5$  Films down to 25 nm Thickness," *Journal of Applied Physics*, 112, 014902, Jul. 2012.
- J7. Y. Won, **J. Lee**, M. Asheghi, T. W. Kenny, and K. E. Goodson, "Phase and Thickness Dependent Modulus of  $\text{Ge}_2\text{Sb}_2\text{Te}_5$  Films down to 25 nm Thickness," *Applied Physics Letters*, vol. 100, 161905, Apr. 2012.
- J6. **J. Lee**, M. Asheghi, and K. E. Goodson, "Impact of Thermoelectric Phenomena on Phase Change Memory Performance Metrics and its Scaling," *Nanotechnology*, 23, 205201, 2012.
- J5. **J. Lee**, S. Kim, A. Marconnet, M.A.A. in 't Zandt, M. Asheghi, H.-S. P. Wong, and K. E. Goodson, "Thermoelectric Characterization and Power Generation Using a Silicon-on-Insulator Substrate," *Journal of Microelectromechanical Systems*, 2175704, 21, 2012.
- J4. S. Yoneoka, **J. Lee**, M. Liger, G. Yama, T. Kodama, J. Provine, R. T. Howe, K. E. Goodson, and T. W. Kenny, "Electrical and thermal conduction in ALD nanobridges down to 7-nm thickness," *Nano Letters*, ln203548w, 683-6, Jan. 2012.
- J3. **J. Lee**, S. Kim, R. Jeyasingh, M. Asheghi, H.-S. P. Wong, and K. E. Goodson, "Micro Thermal Stage for Electrothermal Characterization of Phase Change Memory," *IEEE Electron Device Letters*, vol.32, no.7, pp.952-954, Jul. 2011.
- J2. Z. Li, **J. Lee**, J. P. Reifenberg, M. Asheghi, R. Jeyasingh, H.-S. P. Wong, and K. E. Goodson, Grain Boundaries, "Grain Boundaries, Phase Impurities, and Anisotropic Thermal Conduction in Phase-Change Memory," *IEEE Electron Device Letters*, vol.32, no.7, pp.961-963, Jul. 2011.
- J1. **J. Lee**, Z. Li, J. P. Reifenberg, M. Asheghi, and K. E. Goodson, "Thermal Conductivity Anisotropy and Grain Structure of  $\text{Ge}_2\text{Sb}_2\text{Te}_5$  Films," *Journal of Applied Physics*, vol. 109, 084902, Apr. 2011.

## Selected Honors

- Hellman Faculty Award, 2018
- UCI 2017-2018 Research and Travel Award, HSSoE Research Committee, 2018
- Best Oral Presentation Award, MRS Spring Meeting, 2018
- UCI 2016-2017 Research and Travel Award, HSSoE Research Committee, 2017
- JPL Faculty Research Program Award, Jet Propulsion Laboratory, 2016
- UCI 2015-2016 Research and Travel Award, HSSoE Research Committee, 2016
- Best Oral Presentation Award, MRS Fall Meeting, 2012
- Best Paper in Session Award, SRC TechCon, 2012
- Best Paper in Session Award, Micro/Nanoscale Heat & Mass Tran. Intl. Conf., 2012

## Synergistic Activities

- **Editorial Service:** ECS Journal of Solid State Science and Technology, Focus Issue on Thermoelectric Materials & Devices, Guest Editor, 2016-17
- **Journal Peer Reviews:** Nature Materials, Nature Communications, Physical Review Letters, Applied Physics Letters, Journal of Applied Physics, Journal of Microelectromechanical Systems, International Journal of Heat and Mass Transfer, Physica E: Low-dimensional Systems and Nanostructures, International Journal of Thermal Sciences, and Journal of Electronic Materials.
- **Broadening the Participation of Underrepresented Groups:** California Alliance for Minority Participation (CAMP), Faculty Advisor (2016-2018).
- **Conference Involvement**
  - Symposium Chair of Thermoelectric and Thermal Interface Materials, 236<sup>th</sup> ECS Meeting, October 13-17, 2019
  - Session Chair of Thermal Transport In Nanotechnology, IEEE Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (**ITherm**), May 28 – 31, 2019
  - Session Chair of Thermal-mechanical Interactions in Microelectronics Packages and Systems, **ITherm**, May 29 – June 1, 2018
  - Co-Symposium Chair of Thermoelectric and Thermal Interface Materials, 232<sup>nd</sup> ECS Meeting, October 1-5, 2017
  - Session Chair of Photovoltaics and Heat Transfer, Session Chair of Academic Poster Session, 2017 International Technical Conference and Exhibition on Packaging and Integration of Electronic and Photonic Microsystems (**InterPACK**) August 29 – September 1, 2017
  - Session Chair of Micro and Nano-scale Systems, 2017 2nd Thermal and Fluids Engineering Conference (**TFEC**), April 2 – 5, 2017
  - Session Chair of MEMS and Co-Session Chair of Student Poster and Networking Session, 2016 **ITherm**, May 31 – June 3, 2016
  - Session Chair of EE7.14: Thermal Conductivity in Thermoelectrics, 2016 Materials Research Society (**MRS**) Spring Meeting, March 28-April 1, 2016
  - Session Chair of Student Poster and Networking Session, **InterPACK**, 6-9 July, 2015
- **University Service at UCI**
  - Section Head, Thermal/Transport Sciences Section, Mechanical and Aerospace Engineering, 2019-Present
  - Chair, Seminar Committee, Mechanical and Aerospace Engineering, 2017-Present
  - Member, Graduate Studies Committee, Mech. and Aero. Engineering, 2015-2018
  - Undergraduate Studies Committee, Mechanical and Aerospace Engineering , 2015-16

## Former Advisors

**Ph.D. Thesis Advisor:** Kenneth E. Goodson, Stanford University  
**Postdoctoral Advisor:** Peidong Yang, University of California, Berkeley