Austin J. Minnich

Professor of Mechanical Engineering and Applied Physics

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Professional Preparation

2006	B.S.	University of California, Berkeley
2008	S.M.	Massachusetts Institute of Technology
2011	Ph.D.	Massachusetts Institute of Technology

Appointments

2022 - Present	Deputy Chair, Division of Engineering and Applied Science
2017 - Present	Professor, California Institute of Technology
2011 - 2017	Assistant Professor, California Institute of Technology

Awards and Honors

2019	Presidential Early Career Award for Scientists and Engineers (PECASE)
2017	Junior Prize, International Photoacoustic and Photothermal Association
2017	ASME Bergles-Rohsenow Young Investigator Award in Heat Transfer
2017	ONR Director of Research Award
2015	ONR Young Investigator Award
2013	NSF CAREER Award

Research Interests

Low noise microwave amplifiers, microwave and millimeter wave instrumentation, thin-film growth and processing, atomic-layer deposition and etching

Publications

Submitted papers

1. Chen, I. I., J. Solgaard, R. Sekine, A. A. Hossain, A. Ardizzi, D. S. Catherall, A. Marandi, J. R. Renzas, F. Greer, and A. J. Minnich. *Directional atomic layer etching of MgO-doped lithium niobate using sequential exposures of H_2 and SF_6 plasma*. 2024. arXiv: 2310.10592 [cond-mat.mes-hall].
2. Kamakari, H., J. Sun, Y. Li, J. J. Thio, T. P. Gujarati, M. P. A. Fisher, M. Motta, and A. J. Minnich. *Experimental demonstration of scalable cross-entropy benchmarking to detect measurement-induced phase transitions on a superconducting quantum processor*. 2024. arXiv: 2403.00938 [quant-ph].
3. Sun, S.-N., B. Marinelli, J. M. Koh, Y. Kim, L. B. Nguyen, L. Chen, J. M. Kreikebaum, D. I. Santiago, I. Siddiqi, and A. J. Minnich. *Quantum Computation of Frequency-Domain Molecular Response Properties Using a Three-Qubit iToffoli Gate*. 2023. arXiv: 2302.04271 [quant-ph].
4. Gabritchidze, B., K. A. Cleary, A. C. Readhead, and A. J. Minnich. *A Physical Model for Drain Noise in High Electron Mobility Transistors: Theory and Experiment*. 2022. DOI: 10.48550/arxiv.2209.02858. https://arxiv.org/abs/2209.02858 (visited on 09/08/2022).

Refereed Journal Publications

1. Naik, N. R., B. Gabritchidze, J. H. Chen, K. A. Cleary, J. Kooi, and A. J. Minnich. *Journal of Applied Physics* **135**(16) (2024), 164501. https://doi.org/10.1063/5.0210218.

2. Catherall, D. S. and A. J. Minnich. *Phys. Rev. B* **107**(3) (Jan. 2023), 035201. https://link.aps.org/doi/10.1103/PhysRevB.107.035201.
3. Catherall, D. S. and A. J. Minnich. *Phys. Rev. B* **108**(23) (Dec. 2023), 235207. https://link.aps.org/doi/10.1103/PhysRevB.108.235207.
4. Esho, I. and A. J. Minnich. *Phys. Rev. B* **108** (16 Oct. 2023), 165202. https://link.aps.org/doi/10.1103/PhysRevB.108.165202.
5. Hatanpää, B., A. Y. Choi, P. S. Cheng, and A. J. Minnich. *Phys. Rev. B* **107**(4) (Jan. 2023), L041110. https://link.aps.org/doi/10.1103/PhysRevB.107.L041110.
6. Hossain, A. A., H. Wang, D. S. Catherall, M. Leung, H. C. M. Knoops, J. R. Renzas, and A. J. Minnich. *J. Vac. Sci. Technol., A* **41**(6) (Nov. 2023). https://pubs.aip.org/avs/jva/article/41/6/062601/2912772/Isotropic-plasma-thermal-atomic-layer-etching-of.
7. Koh, J. M., S.-N. Sun, M. Motta, and A. J. Minnich. *Nature physics* **19** (June 2023), 1314–1319. https://www.nature.com/articles/s41567-023-02076-6.
8. Sun, J. and A. J. Minnich. *Phys. Rev. B* **107**(20) (May 2023), 205201. https://link.aps.org/doi/10.1103/PhysRevB.107.205201.
9. Tan, A. T. K., S.-N. Sun, R. N. Tazhigulov, G. K.-L. Chan, and A. J. Minnich. *Phys. Rev. A* **107**(3) (Mar. 2023), 032614. https://link.aps.org/doi/10.1103/PhysRevA.107.032614.
10. Wang, H., A. Hossain, D. Catherall, and A. J. Minnich. *Journal of Vacuum Science & Technology A* **41**(3) (May 2023). https://pubs.aip.org/jva/article/41/3/032606/2887903/Isotropic-plasma-thermal-atomic-layer-etching-of.
11. Ardizzi, A. J., A. Y. Choi, B. Gabritchidze, J. Kooi, K. A. Cleary, A. C. Readhead, and A. J. Minnich. *Journal of applied physics* **132**(8) (Aug. 2022), 084501. https://aip.scitation.org/doi/10.1063/5.0103156.
12. Cheng, P. S., J. Sun, S.-N. Sun, A. Y. Choi, and A. J. Minnich. *Phys. Rev. B* **106**(24) (Dec. 2022), 245201. https://link.aps.org/doi/10.1103/PhysRevB.106.245201.
13. Esho, I., A. Y. Choi, and A. J. Minnich. *Journal of applied physics* **131**(8) (Feb. 2022), 085111. https://aip.scitation.org/doi/10.1063/5.0069352.
14. Gabritchidze, B., K. Cleary, J. Kooi, I. Esho, A. C. Readhead, and A. J. Minnich (June 2022), 615–618. https://ieeexplore.ieee.org/document/9865505/.
15. Kamakari, H., S.-N. Sun, M. Motta, and A. J. Minnich. *PRX Quantum* **3**(1) (Feb. 2022), 010320. https://link.aps.org/doi/10.1103/PRXQuantum.3.010320.
16. Kim, T., S. X. Drakopoulos, S. Ronca, and A. J. Minnich. *Nature Communications* **13**(1) (May 2022), 2452. https://www.nature.com/articles/s41467-022-29904-2.
17. Tazhigulov, R. N., S.-N. Sun, R. Haghshenas, H. Zhai, A. T. K. Tan, N. C. Rubin, R. Babbush, A. J. Minnich, and G. K.-L. Chan. *PRX Quantum* **3**(4) (Nov. 2022), 040318. https://10.1103/PRXQuantum.3.040318.
18. Wang, H. and A. J. Minnich. *Matter* **5**(8) (Aug. 2022), 2455–2457. https://www.sciencedirect.com/science/article/pii/S2590238522002934.
19. Choi, A. Y., P. S. Cheng, B. Hatanpää, and A. J. Minnich. *Physical Review Materials* **5**(4) (Apr. 2021), 044603. https://link.aps.org/doi/10.1103/{PhysRevMaterials}.5.044603.
20. Choi, A. Y., I. Esho, B. Gabritchidze, J. Kooi, and A. J. Minnich. *Journal of applied physics* **130**(15) (Oct. 2021), 155107. https://aip.scitation.org/doi/10.1063/5.0063331.
21. Kim, T., J. Moon, and A. J. Minnich. *Physical Review Materials* **5**(6) (June 2021), 065602. https://link.aps.org/doi/10.1103/{PhysRevMaterials}.5.065602.
22. Motta, M., E. Ye, J. R. McClean, Z. Li, A. J. Minnich, R. Babbush, and G. K.-L. Chan. *npj Quantum Information* **7**(1) (Dec. 2021), 83. http://www.nature.com/articles/s41534-021-00416-z.
23. Naik, N. R. and A. J. Minnich. *Journal of applied physics* **130**(17) (Nov. 2021), 174504. https://aip.scitation.org/doi/10.1063/5.0063178.

24. Sun, S.-N., M. Motta, R. N. Tazhigulov, A. T. Tan, G. K.-L. Chan, and A. J. Minnich. *PRX Quantum* (Feb. 2021). `https://journals.aps.org/prxquantum/abstract/10.1103/{PRXQuantum}.2.010317`.
25. Gao, Y., Q. Sun, J. M. Yu, M. Motta, J. McClain, A. F. White, A. J. Minnich, and G. K.-L. Chan. *Physical Review B* (Apr. 2020). `https://journals.aps.org/prb/abstract/10.1103/{PhysRevB}.101.165138`.
26. Sun, B. et al. *Nature Communications* **11**(1) (Nov. 2020), 6039. `http://www.nature.com/articles/s41467-020-19872-w`.
27. Cheng, P., N. Shulumba, and A. J. Minnich. *Physical Review B* **100**(9) (Sept. 2019), 094306. `https://link.aps.org/doi/10.1103/{PhysRevB}.100.094306`.
28. Hua, C., L. Lindsay, X. Chen, and A. J. Minnich. *Physical Review B* **100**(8) (Aug. 2019), 085203. `https://link.aps.org/doi/10.1103/{PhysRevB}.100.085203`.
29. Manley, M. E., O Hellman, N Shulumba, A. F. May, P. J. Stonaha, J. W. Lynn, V. O. Garlea, A Alatas, R. P. Hermann, J. D. Budai, H Wang, B. C. Sales, and A. J. Minnich. *Nature Communications* **10**(1) (Apr. 2019), 1928. `http://dx.doi.org/10.1038/s41467-019-09921-4`.
30. Moon, J., R. P. Hermann, M. E. Manley, A. Alatas, A. H. Said, and A. J. Minnich. *Physical Review Materials* **3**(6) (June 2019), 065601. `https://link.aps.org/doi/10.1103/{PhysRevMaterials}.3.065601`.
31. Motta, M., C. Sun, A. T. K. Tan, M. J. O, E. Ye, A. J. Minnich, F. G. S. L. Brandão, and G. K.-L. Chan. *Nature physics* (Nov. 2019). `http://www.nature.com/articles/s41567-019-0704-4`.
32. Robbins, A. B., S. X. Drakopoulos, I. Martin-Fabiani, S. Ronca, and A. J. Minnich. *Proceedings of the National Academy of Sciences of the United States of America* **116**(35) (Aug. 2019), 17163–17168. `http://dx.doi.org/10.1073/pnas.1905492116`.
33. Thomas, N. H., M. C. Sherrott, J. Broulliet, H. A. Atwater, and A. J. Minnich. *Nano Letters* **19**(6) (June 2019), 3898–3904. `http://dx.doi.org/10.1021/acs.nanolett.9b01086`.
34. Ye, E. and A. J. Minnich. *Journal of applied physics* **125**(5) (Feb. 2019), 055107. `http://aip.scitation.org/doi/10.1063/1.5075481`.
35. Chen, X., C. Hua, H. Zhang, N. K. Ravichandran, and A. J. Minnich. *Phys Rev Appl* **10**(5) (Nov. 2018), 054068. `https://link.aps.org/doi/10.1103/{PhysRevApplied}.10.054068`.
36. DeAngelis, F., M. G. Muraleedharan, J. Moon, H. R. Seyf, A. J. Minnich, A. J. H. McGaughey, and A. Henry. *Nanoscale & Microscale Thermophysical Eng.* (Dec. 2018), 1–36. `https://www.tandfonline.com/doi/full/10.1080/15567265.2018.1519004`.
37. Dou, N. G., R. A. Jagt, C. M. Portela, J. R. Greer, and A. J. Minnich. *Nano Lett* **18**(8) (July 2018), 4755–4761. `http://pubs.acs.org/doi/10.1021/acs.nanolett.8b01191`.
38. Guo, R., Y.-D. Jho, and A. J. Minnich. *Nanoscale* **10** (May 2018), 14432 –14440. `http://dx.doi.org/10.1039/c8nr02150c`.
39. Hua, C. and A. J. Minnich. *Phys. Rev. B* **97** (1 Jan. 2018), 014307. `https://link.aps.org/doi/10.1103/PhysRevB.97.014307`.
40. Ilic, O., N. H. Thomas, T. Christensen, M. C. Sherrott, M. Soljačić, A. J. Minnich, O. D. Miller, and H. A. Atwater. *ACS Nano* **12**(3) (Mar. 2018), 2474–2481. `http://dx.doi.org/10.1021/acsnano.7b08231`.
41. Jurado, Z., J. Kou, S. M. Kamali, A. Faraon, and A. J. Minnich. *J Appl Phys* **124**(18) (Nov. 2018), 183105. `http://aip.scitation.org/doi/10.1063/1.5049733`.
42. Kou, J. and A. J. Minnich. *Opt Express* **26**(18) (Sept. 2018), A729. `https://www.osapublishing.org/abstract.cfm?{URI}=oe-26-18-A729`.
43. Moon, J., B. Latour, and A. J. Minnich. *Phys. Rev. B* **97** (2 Jan. 2018), 024201. `https://link.aps.org/doi/10.1103/PhysRevB.97.024201`.
44. Ravichandran, N. K., H. Zhang, and A. J. Minnich. *Phys. Rev. X* **8**(4) (Oct. 2018), 041004. `https://link.aps.org/doi/10.1103/{PhysRevX}.8.041004`.

45. Yang, L., B. Latour, and A. J. Minnich. *Phys. Rev. B* **97**(20) (May 2018), 205306. https://link.aps.org/doi/10.1103/{PhysRevB}.97.205306.
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48. Kou, J.-l., Z. Jurado, Z. Chen, S. Fan, and A. J. Minnich. *ACS Photonics* (Feb. 2017). http://dx.doi.org/10.1021/acsphotonics.6b00991.
49. Latour, B., N. Shulumba, and A. J. Minnich. *Phys. Rev. B* **96** (10 Sept. 2017), 104310. https://link.aps.org/doi/10.1103/PhysRevB.96.104310.
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53. Thomas, N. H., Z. Chen, S. Fan, and A. J. Minnich. En. *Scientific Reports* **7**(1) (July 2017), 5362. https://www.nature.com/articles/s41598-017-05235-x..
54. Yang, L. and A. J. Minnich. en. *Scientific Reports* **7** (Mar. 2017), 44254. http://www.nature.com/srep/2017/170314/srep44254/full/srep44254.html.
55. Ding, D., T. Kim, and A. J. Minnich. *Scientific Reports* **6** (Sept. 2016), 32744. http://www.nature.com/articles/srep32744.
56. Ding, D., T. Kim, and A. J. Minnich. *Physical Review B* **93**(8) (Feb. 2016), 081402. http://link.aps.org/doi/10.1103/PhysRevB.93.081402.
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60. Ravichandran, N. K. and A. J. Minnich. *Physical Review B* **93**(3) (Jan. 2016), 035314. http://link.aps.org/doi/10.1103/PhysRevB.93.035314.
61. Zhang, H., X. Chen, Y.-D. Jho, and A. J. Minnich. *Nano Letters* **16**(3) (Feb. 2016), 1643–1649. http://dx.doi.org/10.1021/acs.nanolett.5b04499.
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65. Minnich, A. J. *Journal of Physics: Condensed Matter* **27**(5) (Feb. 2015), 053202. http://iopscience.iop.org/0953-8984/27/5/053202.
66. Minnich, A. J. *Physical Review B* **92**(8) (Aug. 2015), 085203. http://link.aps.org/doi/10.1103/PhysRevB.92.085203.
67. Minnich, A. J. *Physical Review B* **91**(8) (Feb. 2015), 085206. http://link.aps.org/doi/10.1103/PhysRevB.91.085206.

68. Minnich, A. J. *Applied Physics Letters* **107**(18) (Nov. 2015), 183106. http://scitation.aip.org/content/aip/journal/apl/107/18/10.1063/1.4935160.

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cember 2009, January-May, July-December 2010, January 2011)., 466 –479. http://pubs.rsc.org/en/Content/ArticleLanding/2009/EE/b822664b.

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92. Poudel, B., Q. Hao, Y. Ma, Y. Lan, A. Minnich, B. Yu, X. Yan, D. Wang, A. Muto, D. Vashaee, X. Chen, J. Liu, M. S. Dresselhaus, G. Chen, and Z. Ren. *Science* **320**(5876) (2008), 634–638. http://www.sciencemag.org.clsproxy.library.caltech.edu/content/320/5876/634.
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Invited Book Chapters

1. Minnich, A. J. "Measuring phonon mean free paths using thermal conductivity spectroscopy". In: ed. by G. Chen. Annual Review of Heat Transfer. Belsevere, 2012.

Invited Seminars and Presentations

1. RPI Quantum Computer Launch Ceremony and Bicentennial Celebration, "Road to Quantum Advantage"; Troy, NY; April 4, 2024.
2. Oxford Instruments: Etch Tech 2024, "Atomic layer etching for quantum devices"; Pasadena, CA; January 25, 2024.
3. USNC-URSI 2024 National Radio Science Meeting, "Towards ultralow-noise InP high electron mobility transistors: investigation of cryogenic microwave noise"; Boulder, CO; January 10, 2024.
4. HRL, "Cryogenic low-noise microwave amplifiers: device physics and next-generation nano fabrication"; Malibu, CA; October 25, 2023.
5. AVS 23rd International Conference on Atomic Layer Deposition (ALD 2023), "Isotropic plasma-thermal atomic layer etching of metal nitrides for quantum devices"; Bellevue, WA; July 25, 2023.
6. The Tenth US-Japan Joint Seminar on Nanoscale Transport Phenomena, "Towards the limits of microwave noise performance in HEMTs: phonon radiation and hot electron transport"; San Diego, CA; July 17, 2023.
7. Seoul National University STAR Lecture, "Ultra-low noise microwave amplifiers for communications and sensing: charge and heat transfer in semiconductors"; Seoul, South Korea; June 8, 2023.
8. Compound Semiconductor Week, "Cryogenic microwave noise characterization of GaN HEMTs"; Jeju, South Korea; May 31, 2023.
9. IBM QISKIT Seminar, "Experimental Realization of a Measurement-Induced Entanglement Phase Transition on a Superconducting Quantum Processor"; April 14, 2023.
10. The Ohio State University Physics Seminar, "Experimental Realization of a Measurement-Induced Entanglement Phase Transition on a Superconducting Quantum Processor"; April 4, 2023.
11. Oxford Instruments Webinar, "Isotropic plasma-thermal atomic layer etching of aluminum nitride for quantum photonics applications"; March 1, 2023.

12. MRS Fall Meeting, "Atomic layer etching: towards layer-by-layer subtractive manufacturing of quantum materials"; Boston, MA; December 1, 2022.
13. Asian Thermophysical Properties Conference, "Atomic tunneling and ultralow thermal conductivity of $BaTiS_3$"; September 29, 2022.
14. International Microwave Symposium, "Towards the fundamental limits of noise performance of III-V high electron mobility transistor microwave amplifiers"; Denver, CO; June 20, 2022.
15. International Conference in Theoretical Physics Workshop, "Atomic tunneling and ultralow thermal conductivity of $BaTiS_3$"; June 3, 2022.
16. MRS Spring Meeting, "Cryogenic heat transfer in high electron mobility transistors: phonon radiation and superfluid helium boiling"; May 23, 2022.
17. IBM Almaden, "Towards physical quantum advantage with superconducting quantum systems: hardware and applications"; May 19, 2022.
18. NSF-JST joint workshop on Thermal Transport, Materials Informatics and Quantum Computing, "Low noise transistor microwave amplifiers for quantum computing"; March 24, 2021.
19. MIT MTL Seminar, "Towards the fundamental limits of noise performance of III-V high electron mobility transistor microwave amplifiers"; March 23, 2022.
20. IBM QISKIT Seminar, "Finite-temperature dynamics of spin systems on near-term quantum hardware"; March 12, 2021.
21. USC Physics Department, "Non-unitary dynamics of spin systems on near-term quantum hardware"; February 3, 2021.
22. NSF Workshop: New Frontiers in Thermal Transport, "Ultralow noise transistor microwave amplifiers for quantum computing"; December 14, 2020.
23. Purdue Viskanta Fellowship Lecture, "Misbehavin': unusual atoms in solids and extreme thermal transport properties"; December 10, 2020.
24. Advanced Quantum Testbed Seminar, "Finite-temperature dynamics of spin systems on near-term quantum hardware"; August 20, 2020
25. UC Riverside Electrical Engineering Department, "Low-noise transistor microwave amplifiers: towards the quantum noise limit"; November 4, 2019.
26. Quantum LA Workshop, "Quantum imaginary-time evolution, quantum Lanczos and quantum thermal averaging", Los Angeles, CA; April 30, 2019.
27. MRS Spring Meeting, "Exploring the Upper Limits of Thermal Conductivity in Molecular Crystals", Phoenix, AZ; April 24, 2019.
28. Kinetic Theory Workshop, "Transport phenomena in solids from first-principles using the linearized Boltzmann equation", Madison, WI; April 19, 2019.
29. APS March Meeting, "Thermal transport in highly anharmonic crystals from first-principles", Los Angeles, CA; March 5, 2018.
30. Air Force Research Laboratory, "Heat and charge transport in solids and devices: a first-principles perspective," Dayton, OH; January 25, 2018.
31. UCLA Chemistry Department, "Heat under the microscope: understanding the microscopic processes that govern thermal transport," Los Angeles, CA; October 23, 2017.
32. **Plenary Award Talk** at International Photothermal and Photoacoustic Association Meeting, "Revealing the microscopic processes that govern heat flow using photothermal experiments," Bilbao, Spain, July 19, 2017.

33. Materials Research Society Spring Meeting, "Real-time probing of strain enhancement of thermal conductivity in polyethylene films ," Phoenix, AZ; April 23, 2017.
34. UC Santa Barbara Mechanical Engineering Department, "Heat under the microscope: understanding the microscopic processes that govern thermal transport," Santa Barbara, CA; November 7, 2016.
35. Army Research Office Workshop on The Future of Vibration Energy Transfer in Solids and Structures: Needs and Opportunities, "Thermal conductivity and lattice instabilities," Seattle, WA; October 18, 2016.
36. **Keynote talk** in 2016 Society of Engineering Sciences Conference, "Thermal phonon scattering at interfaces and boundaries: linking atomistic structure and the phonon spectrum," College Park, MD; October 2, 2016.
37. 2016 Society of Engineering Sciences Conference, "Manipulating near-field and far-field thermal radiation," College Park, MD; October 2, 2016.
38. Thermal Transport at the Nanoscale Workshop, "The importance of interfaces for thermoelectric energy conversion," Telluride, CO; June 22, 2016.
39. Purdue University Mechanical Engineering Department, "Heat under the microscope: understanding the microscopic processes that govern thermal transport," West Lafayette, IN; May 13, 2016.
40. Northwestern University Materials Science Department, "Heat under the microscope: understanding the microscopic processes that govern thermal transport," Evanston, IL; April 19, 2016.
41. UIUC Mechanical Science and Engineering Department, "Heat under the microscope: understanding the microscopic processes that govern thermal transport," Urbana-Champaign, IL; April 18, 2016.
42. Rensselaer Polytechnic Institute Materials Science Department, "Heat under the microscope: understanding the microscopic processes that govern thermal transport," Troy, NY; March 30, 2016.
43. Hume-Rothery Award Symposium, TMS 2016 Annual Meeting, "Experimental Studies of Mode-resolved Thermal Phonon Transport Properties," Nashville, TN; February 16, 2016.
44. Stanford University Materials Science Department, "Heat under the microscope: understanding the microscopic processes that govern thermal transport," Stanford, CA; January 8, 2016.
45. Materials Research Society Fall Meeting, "The importance of interfaces for thermoelectric energy conversion," Boston MA; December 3, 2015.
46. UC Riverside Electrical Engineering Department, "Heat under the microscope: understanding the microscopic processes that govern thermal transport," Riverside, CA; Oct 19, 2015.
47. **Keynote lecture** in thermal management session, Materials Science and Technology 2015, "Exploring the limits of heat dissipation in electronic devices," Columbus, OH; October 5, 2015.
48. University of Minnesota Mechanical Engineering Department, "Heat under the microscope: understanding the microscopic processes that govern thermal transport," Minneapolis, MN; September 30, 2015.
49. Carnegie Mellon Mechanical Engineering Department, "Heat under the microscope: understanding the microscopic processes that govern thermal transport," Pittsburgh, PA; September 11, 2015.

50. American Chemical Society Meeting, Physics Division, "The importance of interfaces for thermoelectric energy conversion," Boston, MA; August 17, 2015.
51. Northrop Grumman Nanomaterials Workshop, "Nanotrusses as multifunctional materials," Redondo Beach, CA; July 6, 2015.
52. Northrop Grumman Photonics group, "Photonic structures for engineering thermal radiation," Redondo Beach, CA; June 25, 2015.
53. Toyota Research Institute North America Thermal Management workshop, "Multilayer thermal switch," Ann Arbor, MI; June 9, 2015.
54. Massachusetts Institute of Technology Mechanical Engineering Department, "Heat under the microscope: understanding the microscopic processes that govern thermal transport," Cambridge, MA; May 6, 2015.
55. "Nanomaterials for Energy" Gordon Conference, "Exploring heat conduction in nanomaterials for energy," Ventura, CA; February 25, 2015.
56. Rutgers University Mechanical Engineering Department, "Heat under the microscope: understanding the microscopic processes that govern thermal transport," New Brunswick, NJ; January 21, 2015.
57. Materials Research Society Fall Meeting, "Understanding and engineering the MFP spectrum," Boston MA; December 1, 2014.
58. ASME International Conference and Exhibition, Panel on measuring phonon MFPs, Montreal, Canada, November 19, 2014.
59. Northrop Grumman Nanophotonics workshop, "Photonic structures for engineering thermal radiation," Redondo Beach, CA; October 14, 2014.
60. University of California, Berkeley Mechanical Engineering Department, "Heat under the microscope: understanding the microscopic processes that govern thermal transport," Berkeley, CA; September 11, 2014.
61. 8th US-Japan Joint Seminar on Nanoscale Transport Phenomena, "Understanding and measuring the phonon MFP spectrum," Santa Clara, CA; July 14, 2014.
62. University of California, Santa Barbara Materials Science Department, "Heat under the microscope: understanding the microscopic processes that govern thermal transport," Santa Barbara, CA; June 6, 2014.
63. Center for Phononics and Thermal Energy Science, Tongji University, Shanghai, China; "Heat under the microscope: understanding the microscopic processes that govern thermal transport," May 31, 2014.
64. University of California, San Diego Mechanical Engineering Department, "Heat under the microscope: understanding the microscopic processes that govern thermal transport," La Jolla, CA; May 12, 2014.
65. Boeing Research and Technology, El Segundo, CA; "Heat under the microscope: understanding the microscopic processes that govern thermal transport," March 27, 2014.
66. APS March Meeting, Denver, CO; "Heat under the microscope: uncovering the microscopic processes of phonon heat conduction," March 7, 2014.
67. University of California, Irvine Mechanical Engineering Department, "Heat under the microscope: understanding the microscopic processes that govern thermal transport," Los Angeles, CA; February 28, 2014.
68. Yonsei University, "Heat under the microscope: understanding the microscopic processes that govern thermal transport," Seoul, South Korea; February 13, 2014.

69. University of Southern California Electrical Engineering Department, “Heat under the microscope: understanding the microscopic processes that govern thermal transport,” Los Angeles, CA; January 22, 2014.
70. University of California, Los Angeles Mechanical Engineering Department, “Heat under the microscope: understanding the microscopic processes that govern thermal transport,” Los Angeles, CA; January 10, 2014.
71. University of California, Santa Barbara Thermoelectrics group, “Understanding and Engineering Phonons for Thermoelectric Energy Conversion,” Santa Barbara, CA; December 10, 2013.
72. University of Washington Mechanical Engineering Department, “Heat under the microscope: understanding the microscopic processes that govern thermal transport,” Seattle, WA; November 5, 2013.
73. University of Oregon Chemistry Department, “Heat under the microscope: understanding the microscopic processes that govern thermal transport,” Eugene, OR; November 4, 2013.
74. WE Heraus Invited Seminar, “Understanding and Engineering Phonons for Thermoelectric Energy Conversion,” Bad Honnef, Germany; April 10, 2013.
75. Materials Research Society Spring Meeting, Symposium V, “The Theory and Practice of Measuring Phonon Mean Free Paths,” San Francisco, CA; April 4, 2013.
76. Boeing Research and Technology, El Segundo, CA; “Understanding and Engineering Phonons for Thermoelectric Energy Conversion,” March 29, 2013.
77. Dow Chemical, “Exploring Nanoscale Heat Transfer for Energy Applications,” Midland, MI; February 21, 2013.
78. UC Riverside Materials Science and Engineering Department, “Understanding and Engineering Phonons for Thermoelectric Energy Conversion,” Riverside, CA; Jan 16, 2013.

Professional Affiliations

American Physical Society (APS), Materials Research Society (MRS)

Professional Activities and Service

- **Reviewer:** Science, Nature, Nature Materials, Nature Nanotechnology, Nature Communications, Scientific Reports, Physical Review Letters, RSC Advances, ACS Nano, Nano Letters, Journal of Applied Physics, Applied Physics Letters, Physical Review B
- **Professional Service:** Conference organizer, 2020 US-Japan Conference; Symposium organizer, 2017 MRS Spring Meeting; NSF Panel Reviewer (2015); Co-organizer, Thermoelectrics session, American Physical Society March Meeting (2013).

Present Thesis Advisees

Nachiket Naik, Adrian Tan, Tomi Esho, Benjamin Hatanpaa, Shi-Ning Sun, Hirsh Kamikari, Jiace Sun, Azmain Hossein, David Catterall, Azmain Hossain, Justin Chen

Present Postdoctoral Scholar Advisees

Haozhe Wang

Former Advisees

Member	Prior position	Current position
Peishi Cheng	Nonprofit data scientist	
Alex Choi	Thermofisher	
Junlong Kou	Graduate Student	Hyacinth Photonics
Andrew Robbins	Graduate Student	Aerospace Corporation
Nate Thomas	Graduate Student	Edisun
Nicholas Dou	Graduate Student	Edisun
Jaeyun Moon	Graduate Student	Postdoc, Oak Ridge National Laboratory
Taeyong Kim	Graduate Student	Postdoc, UCSB
Bo Sun	Postdoctoral Scholar	Assistant Professor, Xinjin University
Ruiqiang Guo	Postdoctoral Scholar	Postdoc, University of Pittsburgh
Nina Shulumba	Postdoctoral Scholar	Postdoc
Lina Yang	Postdoctoral Scholar	Postdoc
Xiangwen Chen	Postdoctoral Scholar	Postdoc, JPL
Hang Zhang	Postdoctoral Scholar	Assistant Professor, Institute of Thermophysics
Ding Ding	Graduate Student	Postdoctoral Scholar, Singapore
Chengyun Hua (Winner of best thesis award in department)	Graduate Student	Russell Postdoctoral Scholar, Oak Ridge National Laboratory
Navaneetha Ravichandran	Graduate Student	Postdoctoral Scholar, Boston College
Benoit Latour	Postdoctoral Scholar	Michellin Tires, France

Courses taught

- ME 201/APh 251 (Low noise microwave electronics), Spring 2020
- ME 201/APh 251 (Introduction to Tensor Networks), Fall 2019
- ME 201/APh 251 (Physics on near-term quantum computers), Spring 2019
- ME 11a (Thermodynamics), Fall 2018
- ME 119ab (Heat and Mass Transfer), Winter/Spring 2018
- ME 118 (Thermodynamics), Fall 2017
- ME 117 (Nano-to-macro Transport Processes), Fall 2016
- ME 119b (Heat and Mass Transfer), Winter 2016
- ME 119a (Heat and Mass Transfer), Fall 2015
- ME 117 (Nano-to-macro Transport Processes), Winter 2015
- ME 11a (Thermodynamics), Fall 2014
- ME 119b (Heat and Mass Transfer), Spring 2014
- ME 18a (Thermodynamics), Winter 2013
- ME 117 (Nano-to-macro Transport Processes), Fall 2012
- ME 119a (Heat and Mass Transfer), Fall 2011