

Longji Cui, Ph.D.

Assistant Professor

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ACADEMIC EMPLOYMET

University of Colorado Boulder

Assistant Professor
Paul M. Rady Department of Mechanical Engineering
Materials Science and Engineering Program

Boulder, CO
Jan 2020-present

University of Colorado Boulder

Visiting Assistant Professor

Boulder, CO
May 2018 - Dec 2019

Rice University

J. Evans Attwell-Welch Postdoctoral Fellow
Department of Physics and Astronomy, Smalley-Curl Institute

Houston, TX
Aug 2018 – Dec 2019

University of Michigan

Graduate Research Assistant
Department of Mechanical Engineering

Ann Arbor, MI
Sept 2013 – Aug 2018

EDUCATION

University of Michigan

Ph.D. in Mechanical Engineering
Thesis: *Probing Heat Transport and Energy Conversion at the Atomic
and Single Molecule Scale*

Ann Arbor, MI
Sept 2013 - Aug 2018

Committee: Prof. Pramod Reddy (Co-Chair), Prof. Edgar Meyhofer (Co-Chair)
Prof. Vikram Gavini, Prof. Ctirad Uher, Prof. Arun Majumdar (Stanford)

Beijing University of Aeronautics and Astronautics

M.S. in Power Engineering and Thermophysics

B.S. in Aerospace Engineering

Beijing, China

Sept 2010 - Jan 2013

Sept 2006 - July 2010

HONORS & AWARDS

Emerging Leaders in Condensed Matter Physics, JPCM	2020
J. Evans Attwell-Welch Fellowship, Rice University	2018-2020
Chinese Government Award for Outstanding Student Abroad	2019
Materials Research Society (MRS) Graduate Student Gold Award	2017
Rackham Predoctoral Fellowship, U-Michigan	2018
Richard and Eleanor Towner Award for Outstanding Ph.D. Research, U-Michigan	2017
Robert M. Caddell Memorial Award for Research, U-Michigan	2016
Alexander Azarkhin Fellowship, U-Michigan	2016
Mechanical Engineering Fellowship, U-Michigan	2013
National Scholarship, Ministry of Education of China	2012

TEACHING

University of Colorado Boulder

Heat Transfer (MCEN 5042)

Spring 2021, Spring 2022

Senior Design (MCEN 4045/4085, Project Director)

Fall 2020, Spring 2021

Introduction to Nanoscale Transport (MCEN 5228)

Spring 2020, Fall 2021

University of Michigan

Instrumentation and Experimental Techniques (ME 599)

Winter 2017

Lab Instructor and Teaching Assistant

Thermodynamics (ME 535)

Winter 2016

Teaching Assistant

Laboratory (ME 495)

Fall 2014

Lab Instructor and Teaching Assistant

SERVICES

Journal Referee

Nature Materials, Nano Letters, ACS Nano, Nanoscale, Applied Physics Letters, Journal of Applied Physics, Journal of Heat Transfer, Scientific Reports, Review of Scientific Instruments, Nanoscale and Microscale Thermophysical Engineering, IEEE Transactions on Instrumentations and Measurement, Journal of Photonics for Energy

Association Memberships

American Physical Society (APS), Materials Research Society (MRS), American Society of Mechanical Engineers (ASME)

PUBLICATIONS

Book Chapters:

- **L. Cui**, E. Meyhofer, P. Reddy, "Experimental approaches for probing heat transfer and energy conversion at the atomic and molecular scale", *Nanoscale Energy Transport*, IOP Publishing (2019).

Journal Articles:

- **L. Cui**, Y. Zhu, P. Nordlander, M. Di Ventra, D. Natelson, "Thousand-fold Increase in Plasmonic Light Emission via Combined Electronic and Optical Excitations ", *Nano Letters* 21(6), 2658–1665 (2021).
- Y. Zhu, D. Natelson, **L. Cui**, "Probing energy dissipation in molecular-scale junctions via surface-enhanced Raman spectroscopy: vibrational pumping and hot carrier enhanced light emission", *Journal of Physics: Condensed Matter* 33, 134001 (2021).
- Y. Zhu, **L. Cui**, D. Natelson, "Hot-carrier enhanced light emission: The origin of above-threshold photons from electrically driven plasmonic tunnel junctions", *Journal of Applied Physics* 128, 233105 (2020).
- **L. Cui**, Y. Zhu, M. Abbasi, A. Ahmadivand, B. Gerislioglu, P. Nordlander, D. Natelson, "Electrically driven hot carrier generation and above-threshold light emission in plasmonic tunnel junctions", *Nano Letters* 20(8), 6067–6075 (2020).

- **L. Cui**, S. Hur, Z. A. Akbar, J. C. Klöckner, W. Jeong, F. Pauly, S.-Y. Jang, P. Reddy, E. Meyhofer, “Thermal conductance of single-molecule junctions”, *Nature* 572, 628-633 (2019).
- H. Wu, Y. Huang, **L. Cui**, K. Zhu, “Active magneto-optical control of near-field radiative heat transfer between graphene sheets”, *Physical Review Applied* 11(05), 054020 (2019).
- **L. Cui**, R. Miao, K. Wang, D. Thompson, L. A. Zotti, J. C. Cuevas, E. Meyhofer, P. Reddy, “Peltier cooling in molecular junctions”, *Nature Nanotechnology* 13, 122-127 (2018). (Cover Article)
- R. Miao, H. Xu, M. Skripnik, **L. Cui**, K. Wang, K. G. L. Pedersen, M. Leijnse, F. Pauly, K. Wärnmark, E. Meyhofer, P. Reddy, H. Linke, “Influence of quantum interference on the thermoelectric properties of molecular junctions”, *Nano Letters*, 18 (9), 5666-5672 (2018).
- **L. Cui**, W. Jeong, S. Hur, M. Matt, J. C. Klöckner, F. Pauly, P. Nielaba, J. C. Cuevas, E. Meyhofer, P. Reddy, “Quantized thermal transport in single atom junctions”, *Science*, 355, 1192 (2017).
- **L. Cui**, E. Meyhofer, P. Reddy, “Thermal transport: Harmony with superatoms”, *Nature Materials*, 16, 10 (2017).
- **L. Cui**, W. Jeong, V. Fernández-Hurtado, J. Feist, F. J. García-Vidal, J. C. Cuevas, E. Meyhofer, P. Reddy, “Study of radiative heat transfer at Ångström and nanometer scale gaps”, *Nature Communications*, 8, 14479 (2017).
- **L. Cui**, R. Miao, C. Jiang, E. Meyhofer, P. Reddy, “Thermal and thermoelectric transport in molecular junctions”, *Journal of Chemical Physics*, 146, 092201 (2017).
- K. Kim, B. Song, V. Fernández, W. Lee, W. Jeong, **L. Cui**, D. Thompson, J. Feist, M. T. Homer Reid, F. J. García-Vidal, J. C. Cuevas, E. Meyhofer, P. Reddy, “Radiative heat transfer in the extreme near field”, *Nature*, 528, 387–391 (2015).
- **L. Cui**, Y. Huang, J. Wang, K.-Y. Zhu, “Ultrafast modulation of near-field heat transfer with tunable metamaterials”, *Applied Physical Letters*, 102, 053106 (2013).
- **L. Cui**, Y. Huang, J. Wang, “Near-field radiative heat transfer between chiral metamaterials”, *Journal of Applied Physics*, 112, 084309 (2012).

Conference Proceedings/Presentations:

- Y. Zhu, L. Cui, M. Abbasi, A. Ahmadvand, B. Gerislioglu, P. Nordlander, M. Di Ventra, D. Natelson, Hot-carrier induced giant above-threshold light emission enhancement in plasmonic tunnel junctions, APS March Meeting (Online), Mar. 202.
- L. Cui, Hot-carrier enhanced upconversion light emission from plasmonic tunnel junctions, METANANO 2020 (International Conference on Metamaterials and Nanophotonics), Georgia (Online); Sept. 2020.
- L. Cui, Probing thermal transport in single-molecule junctions, APS March Meeting, Denver, CO; Mar. 2020.
- L. Cui, Y. Zhu, M. Abbasi, A. Ahmadvand, B. Gerislioglu, P. Nordlander, D. Natelson, Hot-carrier induced above-threshold light emission in plasmonic tunnel junctions. APS March Meeting, Denver, CO; Mar. 2020.
- D. Natelson, C. Evans, L. Cui, Y. Zhu, Plasmons and hot electrons: Open-circuit photovoltages and bias-driven light emission, ACS Fall Meeting, San Diego, CA; Aug. 2019.
- M. Abbasi, C. Evans, X. Wang, L. Cui, D. Natelson, Nanostructured gold thermocouple for photodetection, APS March Meeting, Boston, MA; Mar. 2019.
- L. Cui, P. Reddy, E. Meyhofer, D. Natelson, Probing energy transport in atomic and nanoscale junctions, APS March Meeting, Boston, MA; Mar. 2019.
- L. Cui, E. Meyhofer, P. Reddy, Experimentally probing thermoelectric energy conversion at the molecular scale, APS March Meeting, Los Angeles, CA; Mar. 2018.
- L. Cui, E. Meyhofer, P. Reddy, “Quantized thermal transport in atomic junctions at room temperature”, MRS Fall Meeting, Boston, MA; Nov. 2017.
- L. Cui, “Probing heat transport and Peltier cooling at the atomic scales”, MRS Fall Meeting GSA Special Session, Boston, MA; Nov. 2017.
- L. Cui, W. Jeong, S. Hur, E. Meyhofer, P. Reddy, “Probing thermal transport at the atomic scale”, MRS Spring Meeting, Phoenix, AZ; Apr. 2017.
- L. Cui, E. Meyhofer, P. Reddy, “Probing charge and heat transfer in nanoscale junctions”, APS March Meeting, New Orleans, LA; Mar. 2017.