

Like Li, Ph.D.

Associate Professor

Department of Mechanical Engineering

Mississippi State University

Group Website:

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Nationality: China

Immigration Status: U.S. Permanent Resident

Education

- 2010–2013 **Ph.D.**, *Mechanical Engineering, University of Florida (GPA: 4.0/4.0)*
 Dissertation: *Computational study of heat transfer in fluid-solid flows*
 Advisor: *Dr. Renwei Mei*, Co-Advisor: *Dr. James F. Klausner*
- 2007–2010 **M.S.**, *Mechanical Engineering, Beijing University of Aeronautics & Astronautics, China*
- 2003–2007 **B.S.**, *Mechanical Engineering, Central South University, China*

Professional Experience

- 2023–present **Associate Professor**, *Department of Mechanical Engineering, Mississippi State University (MSSU)*
- 2017–2023 **Assistant Professor**, *Department of Mechanical Engineering, MSSU*
- 2016–2017 **Fixed-Term Faculty**, *Department of Mechanical Engineering, Michigan State University*
- 2015–2016 **Postdoctoral Associate**, *Department of Chemical & Petroleum Engineering, University of Pittsburgh*
- 2013–2015 **Postdoctoral Associate**, *Department of Mechanical & Aerospace Engineering, University of Florida*
- 2010–2013 **Graduate Research & Teaching Assistant**, *Department of Mechanical & Aerospace Engineering, University of Florida*

Research Interests

- Solar receiver/reactor design, modeling and testing for high-temperature thermal/thermochemical energy storage (TES/TCES) and fuel production (e.g., “solar fuels” and “solar electricity”)
- Multiscale modeling of reaction-transport coupling in reactive materials/structures/reactors
- Thermal-mechanical stress and creep-fatigue analysis for high-temperature solar receivers/reactors
- Low-temperature TES/TCES materials and reactors for heating/cooling buildings
- Lattice Boltzmann method (LBM) for complex flows and heat mass transfer
- Phase field method (PFM) for crystal/dendritic growth
- Multi-physics modeling of advanced manufacturing processes (e.g., additive manufacturing)

Awards & Honors

- 2021–2023 **NSF EPSCoR Research Infrastructure Improvement (RII) Track 4 Research Fellow**
- 2019 MSSU Mechanical Engineering Department *Outstanding Junior Faculty Research Award*
- 2014 University of Florida MAE Department *Outstanding Graduate Research Award*
- 2013 Top 1 of the five Most Downloaded *Journal of Computational Physics* Articles in 2013
- 2011 Top 10 Most Downloaded *Journal of Heat Transfer* Articles in Nov. and Dec. 2011
- 2014 NSF Travel Award to ICMMES-2014

2005	Southwest Aluminum (Group) Co., Ltd. China Education Scholarship
2004	National Scholarship of China

Student Awards & Honors

2022–2025	D. Korba, NSF Graduate Research Fellowship Program (GRFP)
2023	D. Korba, MSSU Bagley College of Engineering (BCoE) Graduate Student Research Award
2022	N. Bhatt, MSSU BCoE Student Hall of Fame
2020–2021	N. Bhatt, MSSU Undergraduate Research Scholarship (\$2,500 x 2)
2021	N. Bhatt, 2 nd place in the MSSU Spring 2021 Undergraduate Research Symposium
2020	E. Million, 1 st place in the MSSU Fall 2020 Undergraduate Research Symposium
2020	N. Bhatt, selected to represent the MSSU BCoE to talk in the video event “It’s Major” hosted by the MSSU Admissions Office
2020	E. Million, MSSU Undergraduate Research Scholarship (\$2,500)
2019	D. Korba, MSSU Undergraduate Research Scholarship (\$2,500)

Funded Projects

(Total funding: **\$14,198,835**; funding with Li as PI: **\$4,216,140**; funding to Li’s group: **\$2,815,099**)

Mississippi State University (active)

2023–2025	<u>13. Reactive Particle Based Thermochemical Energy Storage System for Concentrating Solar-thermal Power (TCES-CSP)</u> ○ Sponsor: Department of Energy (DOE) Solar Energy Technologies Office (SETO-22 Program) ○ Lead: Mississippi State University (L. Li, B. Xu) ○ Role: Lead PI ○ Team members: RedoxBlox Inc. (J. Klausner, K. Randhir), Oregon State (N. AuYeung), Sandia National Laboratories (N. Schroeder, C. Ho) ○ Amount: \$3,894,055 (https://www.energy.gov/eere/solar/seto-fiscal-year-2022-concentrating-solar-thermal-power-research-development-and)
2023–2024	<u>12. Thermochemical Energy Storage Reactor Design and Demonstration to Accommodate Renewable Energy Intermittency</u> ○ Sponsor: Tennessee Valley Authority (TVA) FY23 University Project ○ Role: PI ○ Amount: \$150,000 (100% to Li’s group)
2021–2023	<u>11. RII Track-4: Understanding Reaction-Transport Coupling in High-Temperature Thermochemical Energy Storage Systems</u> ○ Sponsor: National Science Foundation (NSF) ○ Role: PI ○ Amount: \$168,062 (100% to Li’s group)

- 2022–2025 **10. Light Trapping, Enclosed Planar-Cavity Receiver for Heating Particles to Enable Low-Cost Energy Storage and Chemical Processes**
- Sponsor: DOE Solar Energy Technologies Office (SETO-21 Program)
 - Lead: National Renewable Energy Laboratory (NREL) (Z. Ma, J. Martinek, J. Netter, P. Davenport, J. Gifford)
 - **Role: Project Co-PI; University PI**
 - Team members: MSSU (L. Li, B. Xu, P. Singh, H. Cho), Purdue (A. Morris), Colorado School of Mines (G. Jackson, X. Wang), King Saud University (H. Al-Ansary), Alumina Energy (S. Braun), Heliogen (P. Gauche, A. Muto)
 - Amount: \$3,750,000
- 2021–2023 **9. Enhancing Particle-to-sCO₂ Heat Exchanger Effectiveness through Novel High-porosity Metallic Foams**
- Sponsor: DOE Solar Energy Technologies Office (SETO-20 Program)
 - Lead: MSSU (P. Singh, L. Li, H. Cho)
 - **Role: Co-PI**
 - Team members: Sandia (K. Albrecht), NREL (Z. Ma)
 - Amount: \$375,000
- 2020–2023 **8. Solid-State Solar Thermochemical Fuel (SoFuel) for Long-Duration Storage**
- Sponsor: DOE Solar Energy Technologies Office (SETO-19 Program)
 - Lead: Michigan State University (J. Klausner, K. Randhir, J. Petrasch)
 - **Role: Project Co-PI; University PI**
 - Team members: MSSU (L. Li), Oregon State (N. AuYeung), Purdue Northwest (N. Ozalp)
 - Amount: \$2,552,286
- 2020–2023 **7. Advanced Additive Manufacturing and High Throughput Materials Discovery**
- Sponsor: U.S. Army Research Laboratory
 - Lead: MSSU
 - **Role: Co-PI**
 - Amount: \$2,100,000
- 2022–2025 **6. Acoustofluidics-based Multifunctional Manipulation of Micro-and Nanoparticles under Reduced Gravity**
- Sponsor: NASA
 - Lead: MSSU
 - **Role: Co-PI**
 - Amount: \$405,070
- 2023–2024 **5. Computational Fluid Dynamics Model for Unmanned Aerial Vehicle System to Quantify Greenhouse Gas Flux**
- Sponsor: Mississippi State University Office of Research and Economic Development (ORED)
 - **Role: PI**
 - Amount: \$2,000 (100% to Li's group)

Mississippi State University (completed)

- 2020–2021 **4. ARL Cold Spray: Develop an Initial Welding-based AM Theoretical Constitutive Model Framework for Inconel 718 and 250 Maraging Steel**
- Sponsor: U.S. Army Research Laboratory
 - Lead: MSSU
 - **Role: Co-PI**
 - Amount: \$250,064
- 2018–2020 **3. Dynamic Natural Convection-Passive Cooling for the LWR Fleet**
- Sponsor: DOE Office of Nuclear Energy
 - Lead: NuVision Engineering Inc.
 - **Role: Co-PI**
 - Amount: \$550,275
- 2020–2021 **2. Design of Additively Manufactured Metal-Foam Structures for Energy Storage in Buildings**
- Sponsor: Mississippi State University Office of Research and Economic Development (ORED)
 - **Role: PI**
 - Amount: \$2,000 (100% to Li's group)

University of Florida (completed)

- 2014–2015 **1. Carbon Dioxide Shuttling Thermochemical Storage Using Strontium Carbonate**
- Sponsor: DOE SunShot Initiative
 - **Role: Co-PI**
 - Amount: \$494,500

Publications

([§]Postdoc/Ph.D. student advised, [¶]undergraduate student advised, *Corresponding author, ^{¶¶}equal contribution) ([Google Scholar](#))

Invention Disclosures and Patents

34. J.F. Klausner, N. AuYeung, K. Randhir, **L. Li**, A. Barde, N. Rhodes, R. Mei, and D.W. Hahn, "Method for the generation of power." *U.S. Patent*, US 10,266,420 B2, 2019.

Book Chapters

33. A. Singh^{*}, K. Randhir, **L. Li**, and N. AuYeung, and A. Arabkoohsar, "Thermochemical Thermal Energy Storage," in Book: Future Grid-Scale Energy Storage Solutions, *Elsevier*, DOI: <https://doi.org/10.1016/B978-0-323-90786-6.00014-5> (2023).
32. D. Korba[§], **L. Li**^{*}, "Interface Treatment for Conjugate Conditions in the Lattice Boltzmann Method for the Convection Diffusion Equation," in Book: Computational Fluid Dynamics Simulations, *IntechOpen*, 2019.

Refereed Journal Articles

32. M. Hayes, D. Korba[§], P. Schimmels, J. Klausner, J. Petrasch, N. AuYeung, **L. Li***, and K. Randhir*, "Experimental demonstration of high-temperature (> 1000° C) heat extraction from a moving-bed oxidation reactor for thermochemical energy storage." *Appl. Energy* 349, 121625 (2023). DOI: [10.1016/j.apenergy.2023.121625](https://doi.org/10.1016/j.apenergy.2023.121625)
31. Y. Aider, I. Kaur, A. Mishra[§], **L. Li**, H. Cho, Z. Ma, J. Martinek, P. Singh*, "Heat transfer characteristics of particle and air flow through additively manufactured lattice frame material based on octet-shape topology." *ASME J. Sol. Energy Eng.*, 145 (6), 061004 (2023). DOI: [10.1115/1.4062196](https://doi.org/10.1115/1.4062196)
30. A. Mishra[§], D. Korba[§], I. Kaur, P. Singh, and **L. Li***, "Prediction and validation of flow properties in porous lattice structures." *ASME J. Fluids Eng.*, 145 (4), 041402 (2023). DOI: [10.1115/1.4056524](https://doi.org/10.1115/1.4056524)
29. D. Korba[§], **L. Li***, "Effects of pore scale and conjugate heat transfer on thermal convection in porous media." *J. Fluid Mech.* 944, A28 (2022). DOI: [10.1017/jfm.2022.491](https://doi.org/10.1017/jfm.2022.491)
28. D. Korba^{§,¶}, W. Huang^{§,¶}, K. Randhir, J. Petrasch, J. Klausner, N. AuYeung, and **L. Li***, "A continuum model for heat and mass transfer in moving-bed reactors for thermochemical energy storage." *Appl. Energy* 313, 118842 (2022). DOI: [10.1016/j.apenergy.2022.118842](https://doi.org/10.1016/j.apenergy.2022.118842)
27. N. Wang[§], S. Bhushan, H. Cho, and **L. Li***, "Modeling of vapor-liquid interactions in condensing ejectors." *Appl. Therm. Eng.* 206, 118111 (2022). DOI: [10.1016/j.applthermaleng.2022.118111](https://doi.org/10.1016/j.applthermaleng.2022.118111)
26. W. Huang^{§,¶}, D. Korba^{§,¶}, K. Randhir, J. Petrasch, J. Klausner, N. AuYeung, and **L. Li***, "Thermochemical reduction modeling in a high-temperature moving-bed reactor for energy storage: 1D model." *Appl. Energy* 306, 118009 (2022). DOI: [10.1016/j.apenergy.2021.118009](https://doi.org/10.1016/j.apenergy.2021.118009)
25. F. Lei, D. Korba[§], W. Huang[§], K. Randhir, **L. Li**, and N. AuYeung*, "Thermochemical heat recuperation for compressed air energy storage." *Energy Convers. Manag.* 250, 114889 (2021). DOI: [10.1016/j.enconman.2021.114889](https://doi.org/10.1016/j.enconman.2021.114889)
24. N. Wang[§], D. Korba[§], Z. Liu, R. Prabhu, M.W. Priddy, S. Yang, L. Chen, and **L. Li***, "Phase-field-lattice Boltzmann method for dendritic growth with melt flow and thermosolutal convection-diffusion." *Comput. Methods Appl. Mech. Eng.* 385, 114026 (2021). DOI: [10.1016/j.cma.2021.114026](https://doi.org/10.1016/j.cma.2021.114026)
23. D. Korba[§], **L. Li***, "Lattice Boltzmann model for conjugate heat transfer across thin walls." *Phys. Rev. E* 103, 043304 (2021). DOI: [10.1103/PhysRevE.103.043304](https://doi.org/10.1103/PhysRevE.103.043304)
22. X. Wang, Y. Liu, **L. Li**, C.O. Yenusah, Y. Xiao, and L. Chen*, "Multi-scale phase-field modeling of layer-by-layer powder compact densification during solid-state direct metal laser sintering." *Mater. Des.* 203, 109615 (2021). DOI: [10.1016/j.matdes.2021.109615](https://doi.org/10.1016/j.matdes.2021.109615)
21. N. Wang[§], I. Kaur, P. Singh, and **L. Li***, "Prediction of effective thermal conductivity of porous lattice structures and validation with additively manufactured metal foams." *Appl. Therm. Eng.*, 187, 116558 (2021). DOI: [10.1016/j.applthermaleng.2021.116558](https://doi.org/10.1016/j.applthermaleng.2021.116558)
20. D. Korba[§], N. Wang[§], and **L. Li***, "Accuracy of interface schemes for conjugate heat and mass transfer in the lattice Boltzmann method." *Int. J. Heat Mass Transfer* 156, 119694 (2020). DOI: [10.1016/j.ijheatmasstransfer.2020.119694](https://doi.org/10.1016/j.ijheatmasstransfer.2020.119694)

19. L. Li*, "Multiple-time-scaling lattice Boltzmann method for the convection diffusion equation." *Phys. Rev. E* 99, 063301 (2019). DOI: [10.1103/PhysRevE.99.063301](https://doi.org/10.1103/PhysRevE.99.063301)
18. K. Randhir*, K. King, N. Rhodes, L. Li, D.W. Hahn, R. Mei, N. AuYeung, and J.F. Klausner, "Magnesium-manganese oxides for high temperature thermochemical energy storage." *J. Energy Storage* 21, 599-610 (2019). DOI: [10.1016/j.est.2018.11.024](https://doi.org/10.1016/j.est.2018.11.024)
17. J.T. Waters, Y. Liu, L. Li, and A.C. Balazs*, "Optimizing micromixer surfaces to deter biofouling." *ACS Appl. Mater. Interfaces* 10, 8374-8383 (2018). DOI: [10.1021/acsami.7b19845](https://doi.org/10.1021/acsami.7b19845)
16. K. Randhir*, N. Rhodes, L. Li, N. AuYeung, D.W. Hahn, R. Mei, and J.F. Klausner, "Magnesioferrites for solar thermochemical fuel production." *Sol. Energy* 163, 1-15 (2018). DOI: [10.1016/j.solener.2017.12.006](https://doi.org/10.1016/j.solener.2017.12.006)
15. C. Chen, L. Li*, R. Mei, and J.F. Klausner, "Chapman-Enskog analyses on the gray lattice Boltzmann equation method for fluid flow in porous media." *J. Stat. Phys.* 171, 493-520 (2018) DOI: [10.1007/s10955-018-2005-1](https://doi.org/10.1007/s10955-018-2005-1)
14. L. Li*, R. Mei, and J.F. Klausner, "Lattice Boltzmann models for the convection-diffusion equation: D2Q5 vs D2Q9." *Int. J. Heat Mass Transfer* 108, 41-62 (2017). DOI: [10.1016/j.ijheatmasstransfer.2016.11.092](https://doi.org/10.1016/j.ijheatmasstransfer.2016.11.092)
13. L. Li*, N. AuYeung, R. Mei, and J.F. Klausner, "Effects of tangential-type boundary condition discontinuity on the accuracy of lattice Boltzmann method for heat and mass transfer." *Phys. Rev. E* 94, 023307 (2016). DOI: [10.1103/PhysRevE.94.023307](https://doi.org/10.1103/PhysRevE.94.023307)
12. L. Li*, C. Chen, N. Rahmatian, A. Singh, N. AuYeung, K. Randhir, R. Mei, J.F. Klausner, D.W. Hahn, and J. Petrasch, "A transient heat transfer model for high temperature solar thermochemical reactors." *Int. J. Hydrog. Energy* 41, 2307-2325 (2016). DOI: [10.1016/j.ijhydene.2015.11.079](https://doi.org/10.1016/j.ijhydene.2015.11.079)
11. N. Rhodes, A. Barde, K. Randhir, L. Li, D.W. Hahn, R. Mei, J.F. Klausner, and N. AuYeung*, "Solar thermochemical energy storage through carbonation cycles of SrCO₃/SrO cycling supported on SrZrO₃." *ChemSusChem* 8, 3793-3798 (2015). DOI: [10.1002/cssc.201501023](https://doi.org/10.1002/cssc.201501023)
 - **Featured Cover Article.**
 - **Reported by** *Sun & Wind Energy, Science World Report, EurekAlert (AAAS), Utility Dive, Kurzweil, Gizmag (now New Atlas), The Chemical Engineer (www.tcetoday.com), and The Engineer (www.theengineer.co.uk).*
10. K. Guo, L. Li, G. Xiao, N. AuYeung, and R. Mei*, "Lattice Boltzmann method for conjugate heat and mass transfer with interfacial jump conditions." *Int. J. Heat Mass Transfer* 88, 306-322 (2015). DOI: [10.1016/j.ijheatmasstransfer.2015.04.064](https://doi.org/10.1016/j.ijheatmasstransfer.2015.04.064)
9. J. Leonard[¶], N. Reyes[¶], K.M. Allen, K. Randhir, L. Li*, N. AuYeung, J. Grunewald, N. Rhodes, M. Bobek, and J.F. Klausner, "Effects of dopant metal variation and material synthesis method on the material properties of mixed metal ferrites in yttria stabilized zirconia for solar thermochemical fuel production." *Int. J. Photoenergy* 2015, 856385 (2015). DOI: [10.1155/2015/856385](https://doi.org/10.1155/2015/856385)
8. L. Li*, C. Chen, R. Mei, and J.F. Klausner, "Conjugate heat and mass transfer in the lattice Boltzmann

equation method.” *Phys. Rev. E* 89, 043308 (2014). DOI: [10.1103/PhysRevE.89.043308](https://doi.org/10.1103/PhysRevE.89.043308)

7. L. Li*, R. Mei, and J.F. Klausner, “Heat transfer evaluation on curved boundaries in thermal lattice Boltzmann equation Method.” *ASME J. Heat Transfer* 136, 012403 (2014). DOI: [10.1115/1.4025046](https://doi.org/10.1115/1.4025046)
6. L. Li*, R. Mei, and J.F. Klausner, “Multiple-relaxation-time lattice Boltzmann model for the axisymmetric convection diffusion equation.” *Int. J. Heat Mass Transfer* 67, 338-351 (2013). DOI: [10.1016/j.ijheatmasstransfer.2013.08.039](https://doi.org/10.1016/j.ijheatmasstransfer.2013.08.039)
5. L. Li, R. Mei*, and J.F. Klausner, “Boundary conditions for thermal lattice Boltzmann equation method.” *J. Comput. Phys.* 237, 366-395 (2013). DOI: [10.1016/j.jcp.2012.11.027](https://doi.org/10.1016/j.jcp.2012.11.027)
 - **Featured** Top 1 of the 5 Most Downloaded *Journal of Computational Physics* Articles in 2013.
4. L. Li*, R. Mei, J.F. Klausner, and D.W. Hahn, “Heat transfer between colliding surfaces and particles.” *ASME J. Heat Transfer* 134, 011301 (2012). DOI: [10.1115/1.4004874](https://doi.org/10.1115/1.4004874)
 - **Featured** Top 10 Most Downloaded *Journal of Heat Transfer* Articles in Nov. 2011 and Dec. 2011.
3. J. Chi, Z. Wang, and L. Li, “Numerical simulation and analysis of low hysteresis brush seals.” *Advanced Materials Research* 452, 1455-1459 (2012).
2. Z. Wang, M. Guo, and L. Li, “Mechanical behaviors of brush seals and sealing performance.” *J. Beijing University of Aeronautics & Astronautics* 37, 10 (2011) (in Chinese).
1. L. Li, Z. Wang, F. Song, W. Wang, and C. Chen, “Numerical investigation of temperature field in brush seals.” *J. Aerospace Power* 25, 5 (2010) (in Chinese).

[Refereed Conference Papers](#)

15. M. Carter[§], D. Korba[§], J. Martinek, Z. Ma, L. Li*, “Thermomechanical stress and creep-fatigue analysis of a high-temperature prototype receiver for heating particles.” *Proceedings of the ASME 2023 17th International Conference on Energy Sustainability (ES2023)*, Washington DC, 2023.
14. A. Mishra[§], D. Korba[§], L. Li*, “Numerical investigation of thermochemical energy extraction in a moving packed bed oxidation reactor-heat exchanger.” *Proceedings of the ASME 2023 17th International Conference on Energy Sustainability (ES2023)*, Washington DC, 2023.
13. D. Korba[§], A. Mishra[§], M. El Amrani[§], K. Randhir, N. Rahmatian, J. Klausner, N. AuYeung, L. Li*, “Tomography-based pore-scale model and prediction of flow and thermal transport properties for thermochemical energy storage materials.” *Proceedings of the 8th Thermal and Fluids Engineering Conference*, College Park, MD, 2023.
12. D. Korba[§], L. Li*, “A coupled finite difference-lattice Boltzmann-based phase field model for dendritic evolution during metal additive manufacturing.” *Proceedings of the 8th Thermal and Fluids Engineering Conference*, College Park, MD, 2023.
11. Y. Aider, A. Mishra[§], L. Li, H. Cho, P. Singh*, “Heat transfer characteristics of particle flow through additively manufactured SS-316L lattice frame material based on Octet-shape topology.” *Proceedings of the ASME 2022 International Mechanical Engineering Congress & Exposition*, Columbus, OH, 2022.

10. W. Huang[§], E. Million[¶], K. Randhir, J. Petrasch, J. Klausner, N. AuYeung, **L. Li***, "Heat transfer modeling in a counter-current moving-bed tubular reactor for high-temperature thermochemical energy storage." *Proceedings of the ASME 15th International Conference on Energy Sustainability*, Virtual, 2021.
9. N. Wang[§], **L. Li***, "Lattice Boltzmann-phase field method for dendritic growth modeling." *Proceedings of the 5-6th Thermal and Fluids Engineering Conference*, Virtual, 2021.
8. **L. Li***, K. Randhir, J.F. Klausner, R. Mei, and N. AuYeung, "Multiscale thermal transport in solar thermochemical energy storage systems." *Proceedings of the 16th International Heat Transfer Conference*, Beijing, China, 2018.
7. J.F. Klausner*, **L. Li**, A. Singh, N. AuYeung, R. Mei, D.W. Hahn, and J. Petrasch, "The role of heat transfer in sunlight to fuel conversion using high-temperature solar thermochemical reactors." *Invited Keynote Papers of the 15th International Heat Transfer Conference*, Kyoto, Japan, 2014.
6. **L. Li***, C. Chen, R. Mei, and J.F. Klausner, "Conjugate interface heat and mass transfer simulation with the lattice Boltzmann equation method." *Proceedings of the ASME 2014 4th Joint US-European Fluids Engineering Division Summer Meeting and 12th International Conference on Nanochannels, Microchannels, and Minichannels*, Chicago, IL, 2014.
5. **L. Li***, A. Singh, N. AuYeung, R. Mei, J. Petrasch, and J.F. Klausner, "Lattice Boltzmann simulation of high-diffusivity problems with application to energy transport in a high-temperature solar thermochemical reactor." *Proceedings of the ASME 2013 Summer Heat Transfer Conference*, Minneapolis, MN, 2013.
4. **L. Li***, R. Mei, and J.F. Klausner, "Heat transfer in thermal lattice Boltzmann equation method." *Proceedings of the ASME 2012 International Mechanical Engineering Congress & Exposition*, Houston, TX, 2012.
3. **L. Li***, R. Mei, J.F. Klausner, and D.W. Hahn, "Heat transfer between colliding surfaces and particles." *Proceedings of the ASME/JSME 2011 8th Thermal Engineering Joint Conference*, Honolulu, HI, 2011.
2. J. Chi, Z. Wang, and **L. Li**, "Numerical simulation and analysis of low hysteresis brush seals." *Proceedings of the 2011 International Conference on Management, Manufacturing & Materials Engineering*, Henan, China, 2011.
1. F. Song, Z. Wang, **L. Li**, and M. Guo, "Thermal field and performance analysis of brush seal." *Proceedings of the 7th China-Japan International Conference on History of Mechanical Technology and Mechanical Design*, Beijing, China, 2008.

[Presentations and Abstracts](#)

17. D. Korba[§], M. Hayes, P. Schimmels, K. Randhir, J. Klausner, N. AuYeung, **L. Li***, Continuum Model for Transport Phenomena and Thermochemical Reactions in Oxidation Reactors for High-Temperature (>1000 °C) Heat Extraction, *Presentations of the 2023 AIChE Annual Meeting*, Orlando, FL, 2023.
16. J. Ortiz-Ulloa, L. Freiberg, F. Lei, D. Korba[§], N. Ozalp, **L. Li**, K. Randhir, J. Petrasch, J. Klausner, N. AuYeung*, "Design of a combined moving-fluidized bed oxidation reactor for high temperature

- solid-state thermochemical energy storage." *Presentations of the 28th SolarPACES Conference*, Albuquerque, NM, 2022.
15. D. Korba[§], K. Randhir, J. Petrasch, J. Klausner, N. AuYeung, **L. Li***, "Modeling of thermochemical reaction-transport coupling in high-temperature solar reactors for energy storage." *Presentations of the ASME 16th International Conference on Energy Sustainability*, Philadelphia, PA, 2022.
 14. D. Korba[§], K. Randhir, J. Petrasch, J. Klausner, N. AuYeung, **L. Li***, "Modeling of high-temperature oxidation in a moving-bed reactor for thermochemical energy storage." *Presentations of the ASME 16th International Conference on Energy Sustainability*, Philadelphia, PA, 2022.
 13. J. Ortiz-Ulloa, F. Lei, L. Freiberl, N. Ozalp, **L. Li**, K. Randhir, J. Petrasch, J. Klausner, N. AuYeung*, "High temperature discharge of solid-state thermochemical energy storage particles in a hybrid fluidized-moving bed reactor: preliminary design." *Presentations of the ASME 16th International Conference on Energy Sustainability*, Philadelphia, PA, 2022.
 12. A. Mishra[§], D. Korba[§], I. Kaur, P. Singh, **L. Li***, "Prediction and validation of flow properties in additively manufactured porous lattice structures." *Presentations of the ASME 2022 Summer Heat Transfer Conference*, Philadelphia, PA, 2022.
 11. **L. Li***, R. Mei, J.F. Klausner, "Lattice Boltzmann models for the convection-diffusion equation: D2Q5 vs D2Q9." *Presentations of the ASME 2017 International Mechanical Engineering Congress & Exposition*, Tampa, FL, 2017.
 10. **L. Li**, H. Shum, O. Shklyaev, V. Yashin, and A. Balazs*, "Designing self-assembling 3D structures of microcapsules." *APS Meeting Abstracts*, Baltimore, MD, 2016.
 9. E. Bagherisereshki, J. Tran, C. Chen, **L. Li**, and N. AuYeung*, "Carbonation kinetics of SrO by CO₂ for solar thermochemical energy storage." *Presentations of the 2015 AIChE Annual Meeting*, Salt Lake City, UT, 2015.
 8. E. Bagherisereshki, K. Randhir, N. Rhodes, **L. Li**, J. Tran, and N. AuYeung*, "Thermochemical energy storage using a strontium oxide/strontium carbonate carbonation cycle." *Presentations of the 2015 AIChE Annual Meeting*, Salt Lake City, UT, 2015.
 7. C. Chen, **L. Li***, R. Mei, and J.F. Klausner, "Chapman-Enskog analyses on gray lattice Boltzmann schemes for fluid flow in porous media." *Presentations of the 67th Annual Meeting of the APS Division of Fluid Dynamics*, San Francisco, CA, 2014.
 6. K. Randhir, N. Rhodes, J. Grunewald[¶], C. Cole, M. Bobek, **L. Li**, N. AuYeung*, D.W. Hahn, R. Mei, and J.F. Klausner, "Thermochemical energy storage using strontium carbonate/strontium oxide system for solar energy utilization." *Presentations of the 2014 AIChE Annual Meeting*, Atlanta, GA, 2014.
 5. J. Julien[¶], J. Grunewald[¶], C. Cole, K. Randhir, N. Rhodes, **L. Li**, and N. AuYeung*, "Solar Thermochemical Energy Storage." *Posters of the 2014 AIChE Annual Meeting*, Atlanta, GA, 2014.
 4. K. Guo, **L. Li**, G. Xiao, and R. Mei*, "Lattice Boltzmann equation method for conjugate heat transfer with temperature and flux jumps at the interface." *Presentations of the 11th International Conference for Mesoscopic Methods in Engineering and Science*, New York, NY, 2014.
 3. N. AuYeung*, **L. Li**, R. Mei, D.W. Hahn, K. Bowles, and A. Dasgupta, "Carbon dioxide shuttling thermochemical energy storage using strontium carbonate." *Posters of the 2014 DOE SunShot Initiative Grand Challenge Summit*, Anaheim, CA, 2014.
 2. J. Grunewald[¶], N. Reyes[¶], J. Leonard[¶], N. AuYeung*, K. Randhir, **L. Li**, and K. Allen, "Solar

thermochemical fuels.” *Posters of 15th Annual Univ. of Florida Undergraduate Research Symposium*, Gainesville, FL, 2014.

1. L. Li*, R. Mei, and J.F. Klausner, “Heat transfer in thermal lattice Boltzmann equation method.” *Posters of the ASME 2012 International Mechanical Engineering Congress & Exposition*, Houston, TX, 2012.

Invited Seminars

2023	“Decarbonizing Electric Grid and Industrial Heat through Thermochemical Energy Storage.” Invited Keynote Lecture, the 15th International Green Energy Conference (IGEC-XV), Glasgow, UK, July 2023.
2023	“Decarbonizing Electric Grid and Industrial Heat through Thermochemical Energy Storage.” Department of Mechanical and Aerospace Engineering, University of Central Florida.
2023	“Decarbonizing Electric Grid and Industrial Heat through Thermochemical Energy Storage.” Department of Mechanical Engineering, Baylor University.
2023	“Decarbonizing Electric Grid and Industrial Heat through Thermochemical Energy Storage.” Department of Mechanical and Aerospace Engineering, University of Missouri.
2023	“Decarbonizing Electric Grid and Industrial Heat through Thermochemical Energy Storage.” Department of Mechanical Engineering, Clemson University.
2022	“Solar Thermal Energy Storage through Thermochemical Processes.” UDC NASA Center for Advanced Manufacturing in Space Technology and Applied Research (CAM-STAR) Guest Seminar, University of the District of Columbia.
2020	“Solar Energy Conversion and Storage through Thermochemical Processes.” Department of Mechanical and Energy Engineering, Indiana University–Purdue University Indianapolis.
2019	“Modeling of Thermochemical Processes from Porescale to Prototype Reactors.” School of Chemical, Biological, and Environmental Engineering, Oregon State University.
2017	“Heat Transfer and Materials Processing in Thermochemical Energy Conversion.” Department of Mechanical Engineering, Mississippi State University.
2015	“Solar Thermochemical Fuel Production and Energy Storage.” Department of Mechanical Engineering, Tennessee Technological University.
2015	“Solar Thermochemical Fuel Production and Energy Storage.” Department of Mechanical Engineering, University of South Florida.

Teaching Experience

Mississippi State University

2017–2020	Instructor , ME 3523 <i>Thermodynamics II</i> (undergraduate).
2019, 2021	Instructor , ME 8313 <i>Conduction Heat Transfer</i> (graduate).
2020, 2022	Instructor , ME 8333 <i>Convective Heat Transfer</i> (graduate).
2021, 2022	Instructor , ME 4373/6373 <i>Air Conditioning</i> (undergraduate/graduate mixed).

Michigan State University

2016, 2017	Instructor , ME 201 <i>Thermodynamics</i> (undergraduate).
2016	Instructor , ME 391 <i>Mechanical Engineering Analysis</i> (undergraduate).

2017 **Instructor**, ME 814 *Convective Heat Transfer* (graduate).

[University of Florida](#)

2010–2011 **Teaching Assistant**, EGM 3344 *Introduction to Numerical Methods of Engineering Analysis* (undergraduate).

2012 **Teaching Assistant**, EML 3007 *Elements of Thermodynamics and Heat Transfer* (undergraduate).

2010–2011 **Teaching Assistant**, EGM 6341 *Numerical Methods of Engineering Analysis I* (graduate).

2011–2012 **Teaching Assistant**, EGM 6813 *Fluid Mechanics II* (graduate).

Advising Experience

[Mississippi State University](#)

Supervisor for postdoc associates

2020–2021 Dr. W. Huang (PhD from Arizona State University)

2022–present Dr. J. Zhao (PhD from University of Waterloo)

Advisor for PhD students

2018–2022 N. Wang (graduated)

2020–present A. Mishra

2021–present D. Korba (**NSF Graduate Research Fellowship Program Awardee**, graduated)

2023–present M. Rahman

2023–present O. Abourazzouk (female)

2019–present Z. Moutassem (distance student)

2020–present E. Michalakakis (distance student)

Advisor for MS students

2019–2021 S. Zhou (graduated)

2019–2022 M. Cooper (graduated)

2022–2023 O. Abourazzouk (female, graduated)

2022–present M. Carter

2022–present M. El Amrani (female)

Committee member for PhD students

2018–2019 S. Muthu (graduated)

2018–2020 R. Neves (graduated, distance student, female)

2018–2020 S. Roy (graduated, female)

2018–2022 O. El Fajri (graduated, female)

2028–present M. Elmellouki

2022–present I. Beckman

2022–present J. Foster (distance student)

Committee member for MS students

2017–2018 K. Tantration (graduated)

2018–2019 D. Patel (graduated)

2022–present H. Shawn

Research Advisor for undergraduate students

- 2018–2019 D. Korba (received *MSSU Undergraduate Research Scholarship* \$2,500)
- 2019–2020 E. Million (received *MSSU Undergraduate Research Scholarship* \$2,500, won 1st place in the *MSSU Fall 2020 Undergraduate Research Symposium*)
- 2020–2022 N. Bhatt (received *MSSU Undergraduate Research Scholarship* \$2,500 x 2, won 2nd place in the *MSSU Spring 2021 Undergraduate Research Symposium*, inducted to *MSSU Bagley College of Engineering Student Hall of Fame* in 2022)
- 2020–2021 G. Gallagher (received *MSSU Office of Research and Economic Development Undergraduate Research Fund* \$1,000)
- 2020–2021 Z. Volan (received *MSSU Office of Research and Economic Development Undergraduate Research Fund* \$1,000)

Academic Advisor for undergraduate students

- 2017–present 25~35 ME students each semester

Michigan State University

Supervisor for postdoc associates

- 2016–2017 Dr. K. Randhir (PhD from University of Florida)

University of Florida

Research Advisor for undergraduate students

- 2013–2015 J. Leonard, J. Grunewald, N. Reyes (female), L. Meroueh (female), J. Julien (female, African America)

Reviewer Service

Proposal Reviewer

- 2021, 2023 Department of Energy (DOE) CAREER proposals
- 2023 DOE BES proposals
- 2023 NSF proposals panel
- 2018, 2021 ACS Petroleum Research Fund (PRF) proposals

Journal Article Reviewer

- 2012–present Acta Mechanica Sinica, Advanced Water Resources, AIAA J. Thermophysics and Heat Transfer, Applied Energy, Applied Mathematics Letters, Applied Thermal Engineering, ASME J. Heat Transfer, ASME J. Thermal Science & Energy Applications, Chemical Engineering Science, Chemical Engineering Journal, Computers & Fluids, Computers & Mathematics with Applications, Frontiers in Heat & Mass Transfer, Fuel, Int. Communications in Heat Mass Transfer, Int. J. Heat Mass Transfer, Int. J. Hydrogen Energy, Int. J. Numerical Methods in Fluids, Int. J. Thermal Sciences, Joule, J. Computational Physics, J. Energy Storage, J. Statistical Physics, Materials and Design, Microfluidics and Nanofluidics, Physical Review E, Progress in Energy and Combustion Science, Scientific Reports, Solar Energy

Conference Paper Reviewer

- 2012–present ASME 2021 15th International Conference on Energy Sustainability, ASTFE 2021 6th Thermal and Fluids Engineering Conference, ASME 2020 14th International Conference on Energy Sustainability, ASTFE 2020 5th Thermal and Fluids Engineering Conference, ASME 2014 4th Joint US-European Fluids Engineering Division Summer Meeting and 12th International Conference on Nanochannels,

Microchannels, and Minichannels (FEDSM-2014), ASME 2014 Int. Mechanical Engineering Congress & Exposition (IMECE-2014), ASME IMECE-2013, ASME IMECE-2012, ASME 2012 Heat Transfer, Fluids Engineering & Nanochannels, Microchannels, and Minichannels Conferences

Conference/Workshop Organizer/Participant

2023	Conference Organizing Committee Member for the <i>2024 ASME 18th International Conference on Energy Sustainability</i> , TBD
2023	Track Chair for the <i>2023 ASME 17th International Conference on Energy Sustainability</i> , Washington DC
2023	Session Chair for the <i>2023 ASTFE 8th Thermal and Fluids Engineering Conference</i> , College Park, MD
2022	Track Chair for the <i>2022 ASME 16th International Conference on Energy Sustainability</i> , Philadelphia, PA
2022	Session Chair for the <i>2022 ASME Summer Heat Transfer Conference</i> , Philadelphia, PA
2022	Session Chair for the <i>2022 ASTFE 7th Thermal and Fluids Engineering Conference</i> , Hybrid
2021	Track Chair for the <i>2021 ASME 15th International Conference on Energy Sustainability</i> , Virtual
2021	Session Chair for the <i>2021 ASTFE 6th Thermal and Fluids Engineering Conference</i> , Virtual
2020	Track Chair for the <i>2020 ASME 14th International Conference on Energy Sustainability</i> , Virtual
2020	Session Chair for the <i>2020 ASTFE 5th Thermal and Fluids Engineering Conference</i> , Virtual
2019	Invited participant to the <i>2019 DOE Workshop on Fundamental Needs for Dynamic and Interactive Thermal Storage Solutions for Buildings</i> , Berkeley, CA
2018	Session Chair for the <i>2018 ASME Power & Energy Conference & Exhibition</i> , Lake Buena Vista, FL
2018	Topic Organizer for the <i>2018 ASME International Mechanical Engineering Congress & Exposition</i> , Pittsburgh, PA
2014	Invited participant to the <i>2014 DOE ARPA-E Energy Innovation Summit</i> , Washington, D.C.
2014	Invited participant to the <i>2014 DOE SunShot Grand Challenge Summit & Peer Review</i> , Anaheim, CA
2010	Graduate Student Assistant as Program Organizer for the <i>7th International Conference on Multiphase Flow (ICMF 2010)</i> , Tampa, FL

Committee Service

University

2020–present	Faculty Advisor , MSSU ASME Student Chapter
2017–present	Member , Mechanical Engineering (ME) Department Graduate Committee
2017–present	Member , ME Undergraduate Course Standardization Committee
2017–present	Member , ME Ph.D. Qualifying Exams Committee
2019, 2020	Member , ME Faculty Candidates Search Committee

National

2023	Member , ASME Energy Sustainability (ES) 2024 Conference Organizing Committee
2023–2026	Vice Chair , Thermal Sciences Technical Committee of the American Society of Thermal and Fluids Engineers (ASTFE)
2020–present	Member , ASME Renewable Energy and Energy Efficiency Technical Committee under Advanced

Energy Systems Division

2020–present **Member**, ASME K-13 Heat Transfer in Multiphase Flow Technical Committee

2020–present **Member**, ASME K-20 Computational Heat Transfer Technical Committee

Professional Affiliations

2010–present American Society of Mechanical Engineers (ASME)

2011–present American Institute of Chemical Engineers (AIChE)

2011–present American Physical Society (APS)

2011–present International Association for Hydrogen Energy (IAHE)

2019–present American Society of Thermal and Fluids Engineers (ASTFE)