Saikat Mukherjee

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Education

Purdue University, West Lafayette, Indiana, USA Fall 2018-Summer 2023
PhD, Mechanical Engineering (3.93/4)
Indian Institute of Technology, Roorkee, India Fall 2012- Spring 2016
Bachelor of Technology, Mechanical Engineering (9.22/10)

Experience

Assistant Professor 2026-
Mechanical Engineering, IIT Kharagpur
Process Systems Engineer 2025-2026
Biocurie Inc.
Postdoctoral Researcher 2023-2025
Braatz Lab, Chemical Engineering, MIT
Visiting Research Assistant 2015
Institut für fluidtechnische Antriebe und Systeme der RWTH Aachen University

Publications (Chronological)

1. **Book Chapters**

a) Gomez, H., Leng, Y., Hu, T., **Mukherjee, S.** and Calo, V., 2023. Phase-Field Modeling for Flow Simulation. In Frontiers in Computational Fluid-Structure Interaction and Flow Simulation: Research from Lead Investigators Under Forty-2023 (pp. 79-117). Cham: Springer International Publishing.

2. **Journal Publications**

a) Inguva, P.K., **Mukherjee, S.**, Walker, P.J., Tenberg, V., Devos, C., Shin, S., Wu, Y., Santra, S., Wang, J., Singh, S., Kanso, M.A., Kim, S.H., Trout, B.L., Bazant, M.Z., Myerson, A.S. and Braatz, R.D., 2025. Mechanistic modeling of lipid nanoparticle formation for the delivery of nucleic acid therapeutics. Biotechnology Advances, p.108643.

b) **Mukherjee, S.** and Gomez, H., 2025. Hydrodynamic cavitation with non-condensable gases: A thickened interface method with differentiable non-equilibrium thermodynamics based on van der Waals theory. Journal of Computational Physics, p.114070.

c) Devos, C., **Mukherjee, S.**, Inguva, P., Singh, S., Wei, Y., Mondal, S., Yu, H., Barbastathis, G., Stelzer, T., Braatz, R.D. and Myerson, A.S., 2025. Impinging jet mixers: A review of their mixing characteristics, performance considerations, and applications. AIChE Journal, 71(1), p.e18595.

d) **Mukherjee, S.** and Gomez, H., 2024. Mixtures of phase transforming fluids and gases: Phase field model and stabilized isogeometric discretization. Computers & Fluids, p.106176.

e) **Mukherjee, S.** and Gomez, H., 2023. Stabilized formulation for phase-transforming flows with special emphasis on cavitation inception. Computer Methods in Applied Mechanics and Engineering, 415, p.116228.

f) **Mukherjee, S.** and Gomez, H., 2022. Effect of dissolved gas on the tensile strength of water. Physics of Fluids, 34(12), p.126112.

g) **Mukherjee, S.** and Gomez, H., 2019. Understanding how non-condensable gases modify cavitation mass transfer through the van der Waals theory of capillarity. Applied Physics Letters, 117(20), p.204102.

h) **Mukherjee, S.** and Gomez, H., 2019. Flow and mixing dynamics of phase-transforming multicomponent fluids. Applied Physics Letters,115(10), p.104101.

i) **Mukherjee, S.**, Datta, S. and Kumar Das, A., 2018. Molecular dynamic study of boiling heat transfer over structured surfaces. Journal of Heat Transfer, 140(5).

3. **Conferences**

a) Devos, C., Wei, Y., **Mukherjee, S.**, Mondal, S., Barbastathis, G., Stelzer, T., Braatz, R. and Myerson, A.S., 2024, October. Mixing within Confined Impinging Jet Mixers: Innovations in Monitoring for Novel Applications. In 2024 AIChE Annual Meeting. AIChE.

b) Inguva, P., **Mukherjee, S.**, Walker, P., Kanso, M., Wang, J., Wu, Y., Tenberg, V., Santra, S., Singh, S., Myerson, A. and Braatz, R., 2024, October. Mechanistic Modeling Strategies for Lipid Nanoparticle Production. In 2024 AIChE Annual Meeting. AIChE.

c) **Mukherjee, S.** and Gomez, H., 2021. Understanding cavitation mass transfer at different scales. In APS Division of Fluid Dynamics Meeting Abstracts (pp. N01-053).

d) **Mukherjee, S.** and Gomez, H., 2020. How Non Condensable gases modify phase change mass transfer. APS Division of Fluid Dynamics Meeting Abstracts, J11.00009.

e) Gomez, H. and **Mukherjee, S.**, 2019. Flow and mixing dynamics of phase-transforming multicomponent fluids. APS Division of Fluid Dynamics Meeting Abstracts, S23.002.

f) **Mukherjee S.**,Datta S. ,Das A.K., Development of Molecular Microscope for Boiling Heat Transfer: A Numerical Study, 6th International and 43rd National Conference of Fluid Mechanics and Fluid Power, Allahabad, December 15-17, 2016.

Academic and Volunteer service

- Reviewer for Applied Physics Letters, Physics of Fluids, International Journal of Heat and Mass Transfer and Engineering with Computers

Honors and Awards

- Kaufman Teaching Certificate Program, MIT (Fall 2025)
- Lynn Fellowship, Purdue University. (Fall 2018 - Summer 2023)
- DAAD Wise Scholarship, Indo-German Academic Exchange Program (2015)