Curriculum Vitae

Himadri Sekhar Basu, M.Tech.

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Personal Information

Date of Birth:	12th May 1993
Place of Birth:	Gourhati, Arambagh, Hooghly, West Bengal-712613, India
Correspondence Address:	Room No. 201, Microfluidics Laboratory, School of Mechanical Sciences, Indian Institute of Technology Bhubaneshwar, Khordha, Odisha-752050, India

Career Objective

To utilise my potential skills and knowledge gained as a dedicated research scholar in the best possible way towards developing microfluidic techniques for the betterment of humanity. At present, I am seeking a post-doctoral opportunity where I can utilise my expertise in microfluidic systems with external stimulators and computational methods through experimental and/or numerical approaches.

Area of Interest

Microfluidics, Multi-phase flow, Electro-hydrodynamics, Flow Instabilities, Heat Transfer, Experimental and Numerical techniques in Fluid Mechanics, Lattice-Boltzmann method

Work Experience

Aug, 2017 – Oct, 2017 — **Junior Research Fellow at IIT Bhubaneswar, Bhubaneswar**
CHF enhancement in pool boiling
Performing experiments on enhancing critical heat flux in pool boiling through surface modification.

Jan, 2017 – May, 2017 — **Teaching Assistant at IIT Bhubaneswar, Bhubaneswar**
Introduction to manufacturing processes
Worked as a teaching assistant under Dr. Ankur Gupta and instructed undergraduate students to use machine tools like lathes for different machining operations in the workshop.

Education

Jan, 2018 – Sep, 2024 — **Doctor of Philosophy** in **Mechanical Engineering**
Indian Institute of Technology Bhubaneswar, Odisha, India

Thesis title: *"Multi-component electro-hydrodynamic flows: a hybrid lattice Boltzmann method based numerical study"* | CGPA: 8.90/10
Advisor: Dr. Sasidhar Kondaraju

Research summary:

- Developed a multi-component numerical framework using lattice-Boltzmann and Finite Difference methods for EHD flows with surface charge convection (SCC).
- Studied the effect of SCC with weak electrical forces in leaky-dielectric regimes.
- Demonstrated distinct deformation/break-up regimes for varying electrical conductivities due to SCC.
- Ascertained electro-rotation in low viscosity droplets.

Jul, 2015 – Jun, 2017 — **Master of Technology** in **Thermal Science and Engineering**
Indian Institute of Technology Bhubaneswar, Odisha, India

Thesis title: *"Hybrid lattice Boltzmann-Finite Difference simulation for study of electrokinetic instability"* | CGPA: 8.74/10
Advisor: Dr. Sasidhar Kondaraju

Research summary:

- Developed a single-phase numerical framework using hybrid lattice-Boltzmann and Finite Difference methods to simulate electrokinetic flow instabilities due to conductivity gradient observed in micro-TAS and FASS devices described by the coupled Ohmic model for binary fluids.

Jul, 2010 – Aug, 2014 — **Bachelor of Technology** in **Mechanical Engineering**
Jalpaiguri Government Engineering College, West Bengal, India
CGPA: 7.91/10

Achievements

2015 – 2017 — **MHRD Scholarship for postgraduate students admitted through GATE**, GATE: 743 (99.145 percentile),
by Ministry of Human Resource Development (MHRD), Government of India (₹12400/month)

2011 – 2014 — **MHRD Scholarship For College And University Students**,
(for students in West Bengal securing over 80% in their 12th Examination)
by Government of West Bengal, India (₹10000/year)

2008 — **National Talent Search Examination**, by NCERT, Government of India
Cleared 2nd Stage examination

Skills

Languages	Bengali:	Mothertongue
	English:	Fluent(TOEFL 2017 score: 6.5, CEFR Level: B2)
	Hindi:	Fluent
	Japanese:	Basic Knowledge
Coding	C, C++, Fortran 90/95, Python, Matlab, LaTeX, Parallel Computing using MPI and OpenMP	
Software Libraries	Basilisk	
Software Packages	Ansys(Fluent), Tecplot 360, ImageJ, SolidWorks, LibreOffice	
Web Development	Html, Css, JavaScript	
Misc.	Linux, Ubuntu, Academic research and teaching, Supervision of undergraduate and post-graduate level projects	

Research Publications

Journal Articles

1. **Basu, H. S.**, Jena, S. K., & Kondaraju, S. (2024). Role of surface charge convection on oblate droplets in different conductivity regimes. *Physics of Fluids*, *36*(10), 102125. https://doi.org/10.1063/5.0225829
2. **Basu, H. S.**, Kondaraju, S., & Bahga, S. S. (2023). Lattice boltzmann finite-difference-based model for fully nonlinear electrohydrodynamic deformation of a liquid droplet. *Phys. Rev. E*, *107*, 065305. https://doi.org/10.1103/PhysRevE.107.065305
3. **Basu, H. S.**, Bahga, S. S., & Kondaraju, S. (2020). A fully coupled hybrid lattice boltzmann and finite difference method-based study of transient electrokinetic flows. *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, *476*(2242), 20200423. https://doi.org/10.1098/rspa.2020.0423

Conference Proceedings

1. **Basu, H. S.**, Bahga, S. S., & Kondaraju, S. (2019). A fully coupled hybrid lattice boltzmann-finite difference method for transient electrokinetics. *28th International Conference on Discrete Simulation of Fluid Dynamics*.

Co-curricular Activities

2011–2012 — Taught science subjects to high school students in JYOTI, The Free Night School, JGEC.

Declaration

I hereby declare that the above information is true to the best of my knowledge and belief.

Hirnadri Sekhar Basu

Referees

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