ANTARIP PODDAR

Assistant Professor, Department of Mechanical Engineering
IIT(ISM) Dhanbad

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EXPERIENCE

Assistant Professor in the Mech. Engg. Dept. Jun, 2021 – present
Indian Institute of Technology (ISM) Dhanbad

Post Graduate Engineer Trainee (PGET) Aug, 2016 – Feb, 2017
Mahindra Research Valey, Chennai,
Mahindra & Mahindra Ltd.

EDUCATION

Ph.D., Mechanical Engg. 2017 – 2021
Indian Institute of Technology Kharagpur
Supervisors: Prof. Suman Chakraborty and Dr. Aditya Bandopadhyay
Thesis: "*Electrically modulated interfacial dynamics: Perspectives from inert droplets to active microswimmers*"

Master of Technology (M. Tech.), Mechanical Engg. 2014-2016
Indian Institute of Technology Kharagpur **CGPA – 9.58/10**
Supervisor: Prof. Suman Chakraborty **Rank-1 in specialization**
Thesis: "*Weak anchoring and surface elasticity effects on the electro-osmosis of nematic liquid crystals*"

Bachelor of Engineering (B. E. - Hons.), Mechanical Engg. 2010-2014
Jadavpur University **CGPA – 8.77/10**

12 th – Higher Secondary (W.B.C.H.S.E.) 2010
Kenduadihi High School Bankura **% Marks – 93.4, Rank-2 in state**

10 th – Madhyamik (W.B.B.S.E.) 2008
Midnapore Collegiate School **% Marks – 92.25**

PUBLICATIONS

Peer-reviewed Journal Publications:

At IIT(ISM) Dhanbad

1. Ghosh, S., Ghoshal, S., and **Poddar, A.**, 2024. Harnessing wall slip towards tunable microswimming in Poiseuille flow, Journal of Fluid Mechanics, 997, A59.
2. Chakraborty, S., Mantripragada, V. T., Chakravarty, A., Goswami, D., and **Poddar, A.**, 2024. Unraveling the complex interplay between abnormal hemorheology and shape asymmetry in flow through stenotic arteries, Computer Methods and Programs in Biomedicine, 257, 108437.
3. Damor, H., Ghosh. S and **Poddar, A.**, 2023. Surface entrapment of micromotors by a background temperature field. Physics of Fluids, 35, 082008.
4. Ghosh, S. and **Poddar, A.**, 2023. Slippery rheotaxis: new regimes for guiding wall-bound microswimmers. Journal of Fluid Mechanics, 967, A14.
5. Behera, N., **Poddar, A.** and Chakraborty, S., 2023. Eccentricity-induced dielectrophoretic migration of a compound drop in a uniform external electric field. Journal of Fluid Mechanics, 963, A17.
6. **Poddar, A.**, 2023. Thermotactic navigation of an artificial microswimmer near a plane wall. Journal of Fluid Mechanics, 956, pp. A25, 1–32.
7. Mantripragada, V. T. and **Poddar, A.**, 2022. Rheology dictated spreading regimes of a non-isothermal sessile drop. Journal of Fluid Mechanics, 951, pp. A42.

During Ph.D.

8. **Poddar, A.**, Bandopadhyay, A. and Chakraborty, S., 2021. Steering a thermally activated micromotor with a nearby isothermal wall. Journal of Fluid Mechanics, 915, pp. A22, 1–32.
9. **Poddar, A.**, Bandopadhyay, A. and Chakraborty, S., 2020. Near-wall hydrodynamic slip triggers swimming state transition of microorganisms. Journal of Fluid Mechanics, 894, pp. A11, 1–34.
10. **Poddar, A.**, Mandal, S., Bandopadhyay, A. and Chakraborty, S., 2019. Electrorheology of a dilute emulsion of surfactant-covered drops. Journal of Fluid Mechanics, 881, pp. 524–550.
11. **Poddar, A.**, Mandal, S., Bandopadhyay, A. and Chakraborty, S., 2019. Electrical switching of a surfactant coated drop in Poiseuille flow. Journal of Fluid Mechanics, 870, pp. 27–66.
12. **Poddar, A.**, Bandopadhyay, A. and Chakraborty, S., 2019. Activated micromotor propulsion by enzyme catalysis in a biofluid medium. Applied Physics Letters, 114(5), 053701.
13. **Poddar, A.**, Mandal, S., Bandopadhyay, A. and Chakraborty, S., 2018. Sedimentation of a surfactant-laden drop under the influence of an electric field. Journal of Fluid Mechanics, 849, pp. 277–311.

During Masters

14. **Poddar, A.**, Dhar, J., and Chakraborty, S., 2017. Electro-osmosis of nematic liquid crystals under weak anchoring and second-order surface effects. Physical Review E, 96, 013114.
15. **Poddar, A.**, Maity, D., Bandopadhyay, A. and Chakraborty, S., 2016. Electrokinetics in polyelectrolyte grafted nanofluidic channels modulated by the ion partitioning effect. Soft Matter, 12, pp. 5968–5978.

During Undergraduation

16. **Poddar, A.**, Chatterjee, R., Ghosh, K., Mukhopadhyay, A. and Sen, S., 2015. Performance assessment of longitudinal flow through rod bundle arrangements using entropy generation minimization approach. Energy Conversion and Management, 99, pp. 359–373.
17. **Poddar, A.**, Chatterjee, R., Chakravarty, A., Ghosh, K., Sen, S., and Mukhopadhyay, A., 2015. A thermal model to characterize the flattening effect of a nuclear fuel element in an annular channel using simple analytical approach. Progress in Nuclear Energy, 85, pp. 441–453.
18. **Poddar, A.**, Chatterjee, R., Chakravarty, A., Ghosh, K., Sen, S., and Mukhopadhyay, A., 2015. Thermodynamic analysis of a solid nuclear fuel element surrounded by flow of coolant through a concentric annular channel. Progress in Nuclear Energy, 85, pp. 178–191.

Conference Publications and Presentations:

1. **Poddar, A.**, Mandal, S., Bandopadhyay, A. and Chakraborty, S. Surfactant-induced alterations in the elctrohydrodynamics of a sedimenting drop, *7th International and 45th National Conference on Fluid Mechanics and Fluid Power (FMFP)*, I.I.T. Bombay, Mumbai, India, December 10-12, 2018, Paper No.-107.
2. Chatterjee, R., **Poddar, A.**, Ghosh, K., Sen, S. and Mukhopadhyay, A. Entropy generation analysis of a nuclear fuel element surrounded by flow of coolant through a concentric annular channel, *5^{th} International and 41^{st} National FMFP Conference*, I.I.T. Kanpur, India, December 12-14, 2014, Paper No.-325.
3. **Poddar, A.**, Chatterjee, R., Ghosh, K., Mukhopadhyay, A. and Sen, S. Performance of central subchannels for parallel flow through infinite bare rod array in a nuclear reactor using entropy generation minimization approach., *5^{th} International and 41^{st} National FMFP Conference*, I.I.T. Kanpur, India, December 12-14, 2014, Paper No.-331.
4. **Poddar, A.**, Chatterjee, R., Ghosh, K., Sen, S. and Mukhopadhyay, A. A simple thermal model to characterize the flattening effect of a heat generating rod in a channel, *11^{th} International and 22^{nd} National ISHMT-ASME Heat and Mass Transfer Conference*, I.I.T. Kharagpur, India, December 28-31, 2013, Paper No.-HMTC1300424.

ACHIEVEMENTS AND AWARDS

- Ranked second in Higher Secondary Exam., 2010 in the state of West Bengal, among about 2,00,000 students.
  (i) Awarded under the 'Scheme of Scholarship for College & University Students' of Government of India.
  (ii) Awarded with the 'Mamraj Agarwal Rashtriya Purashkar' 2010 in the presence of the Hon'ble Governor of West Bengal.
- Ranked first in the M. Tech. specialization of Thermal Science and Engineering at I.I.T. KGP in 2016.
- Won the V. M. K. Shastri. Best Paper Award in ISHMT-ASME International Heat and Mass Transfer Conference, 2013.

Sl. No.	Course Name (course id)	Learners enrolled	Duration	Honorarium from MHRD
1	Introduction to Fluid Mechanics (NOC19-ME15)	More than 3000	Jan-Apr 2019	Rs. 1,50,000.00
2	Fluid Machines (NOC19-ME55)	8441	Aug-Oct 2019	Rs. 1,00,000.00
3	Introduction to Fluid Mechanics (NOC20ME22)	6754	Jan-Apr 2020	Rs. 1,50,000.00
4	Fluid Machines (NOC20ME55)	3444	Aug-Oct 2020	Rs. 1,00,000.00
5	Advanced Fluid Mechanics (NOC20ME54)	7140	Aug-Oct 2020	Rs. 67,500.00
6	Introduction to Fluid Mechanics (NOC21-ME09)	3079	Jan-Apr 2021	Rs. 1,50,000.00

- Secured all India rank of 460 in the Graduate Aptitude Test in Engineering (GATE) among around 1,85,000 candidates.
- AWSAR Best Story Award 2020 by the Department of Science and Technology, India for the popular science story entitled "*Microbots: Tiny Warriors Ready to Fight Demons inside your Body*". [https://www.awsar-dst.in/results-2020].

INVITED TALK

Title: "Some aspects of active matter dynamics in a chemically or biologically tuned environment".
Organizer: University of Pennsylvania Soft Matter Group.
Time and Date: 4th Feb, 2021, 11:00 am (EST).
Host: Prof. Arnold Mathijssen

TEACHING EXPERIENCE

Theory Courses

1. Engineering Mechanics - (Monsoon, Winter - 2021-22), (Monsoon, Winter - 2022-23)

Laboratory Courses

1. Applied Mechanics Lab. - (Monsoon 2021-22)
2. Thermodynamics and Fluid Mechanics Lab. - (Monsoon 2022-23)
3. Heat Transfer and Fluid Machines Lab. - (Winter 2022-23)

Teaching Assistantship

Departmental courses at IIT Kharagpur:

U.G. Courses: Fluid Mechanics (ME21001), Thermodynamics (ME22002).
P.G. Courses: Advanced Fluid Mechanics (ME61003), Microfluidics (ME60310).

NPTEL online certification courses funded by MHRD:

I was responsible for preparing the assignments, sample question papers, live doubt clearances, and evaluation of students enrolled in the above courses. These courses provided me the opportunity to brush up the fundamentals and exposed me to the different facets of classroom/online teaching.

PROFESSIONAL MEMBERSHIP

(i) Lifetime member of National Society for Fluid Mechanics and Fluid Power (NSFMFP), (ii) Indian Society of Heat and Mass Transfer (ISHMT).

Referee of Physics of Fluids.

Served as a Session chair in Fluid Mechanics and Fluid Power Conference, 2023, IIT Jodhpur.

LANGUAGES

English: Read, write, speak (fluent)

Bengali: Mother tongue

Hindi: Read and speak

LIST OF REFERENCES

1. **Prof. Suman Chakraborty**
   Department of Mechanical Engineering,
   Indian Institute of Technology Kharagpur,
   Kharagpur - 721302, India.
   Phone: +91-3222-282990
   Email: suman@mech.iitkgp.ac.in
2. **Dr. Somnath Roy**
   Associate Professor,
   Department of Mechanical Engineering,
   Indian Institute of Technology Kharagpur,
   Kharagpur - 721302, India.
   Email: somnath.roy@mech.iitkgp.ac.in
3. **Prof. Achintya Mukhopadhyay**
   Mechanical Engineering Department,
   Jadavpur University,
   Kolkata - 700032, India.
   Email: achintya.mukho@gmail.com