

SOURAV SENGUPTA

Assistant Professor
Department of Chemical Engineering
IIT (ISM) Dhanbad
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EDUCATION

- **Indian Institute of Technology Kharagpur, India**
Doctor of Philosophy (PhD), Chemical Engineering, 2016-2021
Thesis: Hydrodynamic stability of non-Newtonian fluid-porous channel flows
Adviser: Prof. Sirshendu De
- **Indian Institute of Technology Kharagpur, India**
Master of Technology (M. Tech), Chemical Engineering, 2014-2016
CGPA: 9.82/10.0 [Department Rank: 2]
Thesis: Modelling of non-solvent induced phase separation during membrane casting
Adviser: Prof. Sirshendu De
- **Jadavpur University, Kolkata, India**
Bachelor of Engineering (B. E.), Chemical Engineering, 2009-2013
CGPA: 9.27/10.0 [Department Rank: 5]

PROFESSIONAL EXPERIENCE

- **Indian Institute of Technology (Indian School of Mines) Dhanbad**
Assistant Professor, Department of Chemical Engineering, 2022–present
- **Indian Oil Corporation Limited**
Production Engineer, Refineries Division, 2013-2014.

RESEARCH INTERESTS

- Hydrodynamic stability
- Non-Newtonian flows
- Flow dynamics in porous media
- Biological fluid dynamics
- Electrokinetics and microscale transport
- Physics-informed data-driven modelling

SPONSORED RESEARCH PROJECTS

- **Start-up Research Grant (SRG)**, Science and Engineering Research Board (SERB), Department of Science and Technology, Govt. of India.
- **Faculty Research Scheme (FRS)**, IIT (ISM) Dhanbad.

PUBLICATIONS

In peer-reviewed journals

J12. S. Sengupta, T. Dasgupta, D. Roy, M. Dejam, S. De, “Combined electroosmotic and pressure-driven transport of neutral solutes across a rough, porous-walled microtube”, **Electrophoresis**, 44 (2023) 711-724.

J11. S. Sinha, D. Roy, **S. Sengupta**, S. Neogi, S. De, “Froth flotation as primary treatment of flowback water: removal of total organic carbon and prediction of kinetics”, **The Canadian Journal of Chemical Engineering**, 101 (2023) 4160-4169.

J10. S. Sengupta, S. De, “Effect of the transition layer on the stability of a fluid-porous configuration: Impact on power-law rheology”, **Physical Review Fluids**, 6 (2021) 063902.

J9. S. Sengupta, S. De, “Long-time instability and transient behavior of pressure-driven flow of a power-law fluid in a plane channel overlying a porous layer”, **Physics of Fluids**, 33 (2021) 054109.

J8. S. Sengupta, S. De, “Effect of Couette component on the stability of Poiseuille flow of a Bingham fluid-porous system: modal and non-modal approaches”, **Physics of Fluids**, 32 (2020) 064103.

J7. S. Sengupta, S. De, “Stability of Poiseuille flow of a Bingham fluid overlying an anisotropic and inhomogeneous porous layer”, **Journal of Fluid Mechanics**, 874 (2019) 573-605.

J6. S. Sengupta, S. De, “Couette-Poiseuille flow of a Bingham fluid through a channel overlying a porous layer”, **Journal of Non-Newtonian Fluid Mechanics**, 265 (2019) 28-40.

J5. S. Sengupta, A. Jain, S. De, “Criteria for unique steady state for enzymatic depectinization of bael (*Aegle marmelos*) juice in a continuous stirred tank reactor”, **Reaction Chemistry & Engineering**, 3 (2018) 333-343.

J4. A. Jain, **S. Sengupta**, S. De, “Fundamental understanding of fouling mechanisms during microfiltration of bitter gourd (*Momordica charantia*) extract and their dependence on operating conditions”, **Food & Bioprocess Technology**, 11 (2018) 1012-1026.

J3. K. A. Ninga, **S. Sengupta**, A. Jain, Z. S. C. Desobgo, E. J. Nso, S. De, “Kinetics of enzymatic hydrolysis of pectinaceous matters in Guava juice”, **Journal of Food Engineering**, 221 (2018) 158-166.

J2. A. Jain, **S. Sengupta**, S. De, “Effect of process parameters on aqueous extraction of thymol and other phytonutrients from herbal seed Ajwain (*Trachyspermum ammi* L.)”, **Journal of Applied Research on Medicinal and Aromatic Plants**, 11 (2018) 27-36.

J1. R. Mondal, S. Mondal, K. V Kurada, S. Bhattacharjee, **S. Sengupta**, M. Mondal, S. Karmakar, S. De, I. Griffiths, “Modelling the transport and adsorption dynamics of arsenic in a soil bed filter”, **Chemical Engineering Science**, 210 (2019) 115205.

In conferences

C3. S. Sengupta, S. De. “Modal and non-modal stability of plane Couette-Poiseuille flow of a viscoplastic fluid overlying a porous layer”. **73rd Annual Meeting of the APS Division of Fluid Dynamics (APS-DFD)**, 22 - 24 November 2020, Chicago, IL, USA (Virtual Edition).

C2. S. Sengupta, S. De. “Criteria for a Unique Steady State for Guava Juice Depectinization in a Continuous Stirred Tank Reactor”. **AIChE Annual Meeting 2018**, 28 October - 2 November 2018, held at David L. Lawrence Convention Center, Pittsburgh, PA, USA.

C1. S. Sengupta, S. De. “Thermodynamic Modelling of Membrane formation by Phase Inversion technique”. **Chemical Engineering Congress (CHEMCON) 2015**, 27-30 December 2015, held at IIT Guwahati, Guwahati, India.

TEACHING EXPERIENCE

- **Computational Techniques in Chemical Engineering (CHC503)**, Monsoon 2022-2023, Monsoon 2023-2024, IIT (ISM) Dhanbad.
- **Computational Techniques Lab (CHC507)**, Monsoon 2022-2023, Monsoon 2023-2024, IIT (ISM) Dhanbad.
- **Modelling and Simulation (CHD507)**, Winter 2022-2023, Winter 2023-2024, IIT (ISM) Dhanbad.
- **Process Simulation Lab (CHC309)**, Winter 2022-2023, Winter 2023-2024, IIT (ISM) Dhanbad.

SKILLS

- **Programming Languages:** C, C++
- **Software Packages:** MATLAB, Maple, COMSOL Multiphysics
- **Tools:** MS Office, LATEX

AWARDS, HONOURS, AND ACHIEVEMENTS

- Indian National Academy of Engineering (INAE) Innovative Student Projects Award at Doctoral Level for Ph.D Thesis, in 2022.
- Indian Institute of Chemical Engineers (IICChE) Ambujas Young Researcher's Award, in 2016.
- Indian National Academy of Engineering (INAE) Innovative Student Projects Award at Master's Level for M. Tech Thesis, in 2016.
- All India Rank 36 in Graduate Aptitude Test in Engineering (GATE) 2014 in Chemical Engineering (among 15844 candidates).
- Campus placement offer (during Bachelors programme) in 2013 from Indian Oil Corporation Limited, a Fortune 500 company. Worked there for one year, resigned thereafter to pursue higher studies.
- Selected for the TIFR Visiting Students' Research Programme (VSRP) in 2012, a competitive summer fellowship programme awarded by Tata Institute of Fundamental Research (TIFR), Mumbai, India.
- Selected for the JNCASR Summer Research Fellowship Programme (SRFP) in 2011, a competitive fellowship programme jointly awarded by Department of Science & Technology (DST), India and Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) Bangalore, India.
- Qualified in National Standard Examination in Astronomy (NSEA) 2006, (i.e., 1st Level of Astronomy Olympiad), by being among the top 300 students across India, and became eligible to appear for Indian National Astronomy Olympiad (INAO), conducted by HBCSE, TIFR, Govt. of India. Also, recipient of the Certificate of Merit, for being placed in the State's Top 1% (in the state of West Bengal), issued by Indian Association of Physics Teachers (IAPT), in NSEA 2006.

SERVICE

- Acted as invited referee for the following peer-reviewed international journals
 - *Physics of Fluids*
 - *ASME Journal of Heat and Mass Transfer*