CURRICULUM VITAE – SOURAV MONDAL

Employment History

(April 2018 – present) Assistant Professor, Department of Chemical Engineering, Indian Institute of Technology Kharagpur, Kharagpur 721302, India

(Oct 2015 – Feb 2018) Post-Doctoral Researcher, Mathematical Institute, University of Oxford, UK

Date of Birth

5th September 1987

Research interests

Mathematical modelling of Chemical Engineering processes; Flow through porous medium; membrane separation applications; liquid crystal flows and application in biomolecule detection; computational fluid dynamics; phase separated flows; mass transport phenomena and particle transport at liquid interface; electro-hydrodynamics in microfluidic flows; food product processing.

Academic credentials

Year	Degree	Institution	Marks
2012-2015	PhD (Chemical Engineering)	Indian Institute of Technology (IIT) Kharagpur, India	
2010-2012	Masters (Chemical Engineering)	Indian Institute of Technology (IIT) Kharagpur, India	GPA 9.67/10
2006-2010	Undergraduate (Chemical Engineering)	Jadavpur University, Kolkata, India	GPA 8.75/10

DOCTORAL THESIS: "Transport phenomena based modelling of membrane separation processes", supervised by Prof. Sirshendu De, Indian Institute of Technology Kharagpur, India.

MASTER'S THESIS: "Simulation of various membrane processes: Physical models and molecular dynamics based models", supervised by Prof. Sirshendu De, Indian Institute of Technology Kharagpur, India.

AWARDS:

INAE Young Engineer Award 2021, by the Indian National Academy of Engineering, New Delhi.
https://www.inae.in/inae-young-engineer-award-2018/

Amar Chem Dye Award 2021 from the Indian Institute of Chemical Engineers (IIChE) for excellence in research and development.

Vice-Chancellor's (Oxford University) Innovation award in 2018 on the team-work "Mitigation of arsenic mass poisoning: a unified experimental and theoretical approach".
https://www.ox.ac.uk/research/vice-chancellors-innovation-awards/vice-chancellor-s-innovation-awards-2018
https://www.ox.ac.uk/research/research-impact/mitigation-arsenic-mass-poisoning-unified-experimental-and-theoretical

Dr A V Rama Rao Foundation's Best Ph.D. Thesis and Research Award in Chemical Engineering/Technology 2017, by the Indian Institute of Chemical Engineers (IIChE).
https://www.iiche.org.in/studentawards.php

Finalist in the Institution of Chemical Engineers (IChemE) Global award 2016 Young chemical engineer in research.
https://www.icheme.org/about-us/press-releases/icheme-announce-global-awards-2016-finalists/
https://engineering-update.co.uk/2016/08/17/icheme-announce-global-awards-2016-finalists/

Shastri Indo-Canadian Institute Faculty and Student Mobility Award 2012-13 (visited Department of Mechanical Engineering, University of Alberta).
https://www.shastriinstitute.org/sites/default/files/Annualpdf/Annual%20Report%202012-2013%20Final.compressed.pdf

Editorial activities:

Editorial board member of the journal - Discover Chemical engineering (Springer-Nature)
https://www.springer.com/journal/43938/editors

Invited reviewer for Journal of Fluid Mechanics, Journal of Membrane Science, AIChE Journal, Desalination, Journal of Colloid & Interface Science, Chemical Engineering Science, Journal of Industrial & Engineering Chemistry, Journal of Cleaner Production and Energy Conversion & Management.

Research Grant applications:

(1) Principal investigator to the project sponsored by Science & Engineering Research Board (Department of Science & Technology, Govt. of India) "Novel colloidal interactions in liquid crystal under the influence of external field", Jan 2022-Jan 2025 (INR 15.62 lakhs).

(2) Principal investigator to the project sponsored by H3 services, Kolkata, "Speciation and determination of the bio-actives in essential oil blends for use in scented candles", Mar 2022 – Feb 2023 (INR 4.72 lakhs).

(3) Principal investigator of the project sponsored by IIT Kharagpur "Fluid Instabilities and Deformation in Porous Medium", Jan 2019-Jan 2022 (INR 28 Lakhs).

(4) Joint investigator with Dr Ian Griffiths for the EPSRC Global Challenges Research Fund on the project "Forecasting contaminant percolation through soil beds in India", Aug 2016-Mar 2017 (GBP 57,011).

(5) Joint applicant with Dr Ian Griffiths for financial grant from Royal Society, UK for organizing an international workshop "Unifying scientific disciplines to understand and solve emerging membrane filtration challenges", 9-11 January 2017 (GBP 5,000), in Chicheley Hall, Milton Keynes: UK;
https://people.maths.ox.ac.uk/griffit4/cwi_2017.shtml

(6) Supervised a mini-project sponsored by Schlumberger on "Hydrodynamics and species transport during Gel formation for converging flows", May-July 2016 (GBP 5000).

(7) Jointly supervised a mini-project sponsored by Schlumberger on "Ternary Phase Diagrams for Surfactant/Oil/Brine Mixtures", May-July 2017 (GBP 5000).

Teaching Courses:

Autumn CH62003: Process Modelling and Simulation (PG level, around 25 students)
Autumn CH39022 & Spring CH39023: Process Equipment Design (UG level, around 45 students)
Spring CH31010: Mass Transfer (UG level, around 90 students)
Spring CH30014: Chemical Process Technology (UG level, around 90 students)

Instructor in Modelling camps / workshops

(1) Instructor to a group at the 28th European Consortium for Modelling in Industry (ECMI) modelling week at the Department of Computational Engineering and Physics of Lappeenranta University of Technology, Finland from July 9-16, 2017 (masters level students).

(2) Instructor to a group at the XI Modelling week at the Faculty of Mathematics of Universidad Complutense de Madrid, from 19-23 June 2017 (masters and doctoral level students).

(3) Instructor to the Graduate modelling camp held at University of Oxford, 13-17 March, supervising a group of doctoral students.

(4) Joint-Instructor to the case studies for mathematical modelling in MSc (applied mathematics) final year of five students Jan-Mar 2017 at the Mathematical Institute, University of Oxford.

(5) Instructor to a group for the case study problem (1 credit) supervising 6 doctoral students at the Mathematical Institute, University of Oxford for 2 weeks, January 2017.

(6) Instructor to a group at the 28th European Consortium for Modeling in Industry (ECMI) modelling week in University of Sofia, Sofia, July 17-25, 2016 (masters level students).

Knowledge and Technology Translation:

Research Collaboration: Development of a full 3D CFD model of the pilot scale electrothermal reactor for magnesium production. The model predicts the temperature and magnesium species spatial transport profiles which is necessary for process intensification and control.

Community Engagement: Technology demonstration of the low cost activated laterite adsorbent for supply of arsenic free drinking water to the affected communities. The demonstration activity has been implemented in three habitations catering to the needs of approximately five thousand populations (Weblink: http://ttgiitkgp.blogspot.in/2015/05/low-cost-highquality-arsenic-filter.html)

Research Participation:
116th European Study group at Industry (ESGI) at University of Durham, April 11-16, 2016. Contributed to the problem on "Flow dynamics in complex buildings (airports and rail stations)" by the UK Department for Transport.

125th European Study group at Industry (ESGI) at Cyprus University of Technology, Dec 5-9, 2016. Contributed on the problem – "The Germasogeia aquifer challenges: transport of pollutants and effective recharge" by the Water Development Department, Cyprus.

Books

(1) S. Mondal, M.K. Purkait, S. De, **Advances in Dye Removal Technologies**, 2018, Springer: Singapore (ISBN 978-981-10-6293-3) [323 pages].

(2) S. De, S. Mondal, S. Banerjee, **Stevioside: Technology, Applications and Health**, 2013, Wiley-Blackwell: Oxford (ISBN 978-1-11-835066-9) [240 pages].

(3) S. De, S. Mondal, **Micellar Enhanced Ultrafiltration: Fundamentals and Applications**, 2012, Taylor & Francis: Boca Raton (ISBN 978-1-43-989568-9) [224 pages].

Patent

S. Mondal, B.K. Thakur, K. Yadav, M. Mondal, R. Mukherjee, A. Roy, B. Barman, S. De, Design of low cost arsenic filter using activated laterite, Indian Patent 597/KOL/2013 (filed).

Book Chapter

(1) K.V. Kurada, **S. Mondal**, S. De, Modelling in membrane separation of bioactives, in: *Membrane technologies for the recovery / purification of food bioactive ingredients*, Eds. S.M. Jafari, R. Castro-Muñoz, 2021, Springer [ISBN 978-3-030-84642-8].

(2) **S. Mondal**, S. De, Reverse osmosis modelling, simulation and optimisation, in: *Current Trends and Future Developments on (Bio-) Membranes*, Eds., A. Basile, A. Cassano, N.K. Rastogi, 2020, Elsevier: Amsterdam (Chapter 8) [ISBN 9780128167779].

(3) **S. Mondal**, C. Conidi, A. Cassano, S. De, Modelling of gel controlling membrane filtration in fruit juice processing, in: *Advanced modeling and control of chemical and biochemical processes*, Eds., S. Chakraborty, S. Curcio, S. Hasan, 2019, Springer: Berlin (Chapter 8).

(4) **S. Mondal** and S. De, Processing of Stevioside using membrane-based separation processes, in: *Integrated Membrane Operations in the Food Production*, Eds., A. Cassano and E. Drioli, 2013, De Gruyter: Berlin (ISBN 978-3-11-028566-6), pp. 201-232.

Journal publications

(1) R. Binjhade, R. Mondal, **S. Mondal**, Continuous photocatalytic reactor: Critical review on the design and performance, Journal of Environmental Chemical Engineering 10 (2022) 107746; DOI: https://doi.org/10.1016/j.jece.2022.107746

(2) S.K. Nayak, **S. Mondal,** Viscosity correction in convective heat transfer correlation of non-Newtonian fluid pipe flow: Revisited, **Chemical Engineering Science** 235 (2021) 116472; DOI: https://doi.org/10.1016/j.ces.2021.116472

(3) P. Singh, R. Lalitha, **S. Mondal**, Saffman-Taylor instability in a radial Hele-Shaw cell for a Shear-dependent rheological fluid, **Journal of non-Newtonian Fluid Mechanics** 294 (2021) 104579; DOI: https://doi.org/10.1016/j.jnnfm.2021.104579

(4) **S. Mondal,** Impact of the process conditions on polymer pattern morphology during spin coating over topological surfaces, **Soft Matter** 17 (2021) 1346 – 1358; DOI: https://doi.org/10.1039/D0SM01622E

(5) **S. Mondal,** S. De, Mass transport in electrokinetic microflows with the wall reaction affecting the hydrodynamics, **Theoretical and Computational Fluid Dynamics** 35 (2021) 39-60; DOI: 10.1007/s00162-020-00549-5

(6) **S. Mondal,** A. Cassano, C. Conidi, S. De, Quantification of selective transport of fructose and glucose during membrane filtration of pomegranate juice, **Food and Bioprocess Technology** (2020) DOI: 10.1007/s11947-020-02558-y

(7) S. Saha, **S. Mondal,** Performance of a Forward Osmosis mass exchanger based on detailed mass transfer boundary layer analysis, **Desalination** 496 (2020) 114708; DOI: https://doi.org/10.1016/j.desal.2020.114708

(8) **S. Mondal**, A. Egea-Corbacho, C. Conidi, A. Cassano, S. De, Permeate flux hysteresis with transmembrane pressure in the gel controlling membrane filtration, **Journal of Food Engineering** 264 (2020) 109689.

(9) S. Bhattacharjee, **S. Mondal**, M. Mondal, S. De, Effect of electrolyte nature in mass transport of a neutral solute in a microtube with porous wall, **AIChE Journal** 66 (2020) e16765, https://doi.org/10.1002/aic.16765

(10) **S. Mondal**, I.M. Griffiths, G. Ramon, Forefronts in structure-performance models of separation membranes, **Journal of Membrane Science** 588 (2019) 117166; DOI: https://doi.org/10.1016/j.memsci.2019.06.006

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

(12) R. Mondal, G. Benham, **S. Mondal**, P. Christodoulides, N. Neokleous, K. Kaouri, Modelling and optimization of water management in sloping coastal aquifers with seepage, extraction and recharge, **Journal of Hydrology** 571 (2019) 474-484.

(13) **S. Mondal**, R.W. Field, Theoretical analysis of the viscosity correction factor for heat transfer in pipe flow, **Chemical Engineering Science** 187 (2018) 27-32; DOI: https://doi.org/10.1016/j.ces.2018.04.047

(14) **S. Mondal,** I.M. Griffiths, F. Charlet, A. Majumdar, Flow and nematic director profiles in a microfluidic channel: the interplay of nematic material constants and backflow, **MDPI Fluids** 3 (2018) 39, DOI: https://doi.org/10.3390/fluids3020039.

(15) **S. Mondal**, A. Majumdar, I.M. Griffiths, Nematohydrodynamics for colloidal self-assembly and transport phenomena, **Journal of Colloid & Interface Science** 528 (2018) 431-442; DOI: 10.1016/j.jcis.2018.05.072

(16) H. Williams, M. McPhail, **S. Mondal**, A. Munch, Modeling gel fiber formation in an emerging coaxial flow from a nozzle, **Journal of Fluid Engineering** 141 (2018) 011107, DOI:10.1115/1.4040833.

(17) S. Chatterjee, **S. Mondal**, S. De, Design and scaling up of fixed bed adsorption columns for lead removal by treated laterite, **Journal of Cleaner Production** 177 (2017) 760-774.

(18) **S. Mondal**, J.J. Wu, R.W. Field, Novel Approach for Sizing Forward Osmosis Membrane Systems, **Journal of Membrane Science** 541 (2017) 321-328.

(19) M. Wang, **S. Mondal**, I. Griffiths, The role of fouling in optimizing direct-flow filtration module design, **Chemical Engineering Science** 163 (2017) 215-222.

(20) **S. Mondal**, A. Roy, R. Mukherjee, M. Mondal, S. Karmakar, S. Chatterjee, M. Mukherjee, S. Bhattacharjee, S. De, A socio-economic study along with impact assessment for laterite-based technology demonstration for arsenic mitigation, **Science of the Total Environment** 583 (2017) 142-152.

(21) **S. Mondal**, S. De, Pressure Driven transport of neutral macro-solute in microchannel with porous wall at High Surface Potential, **International Journal of Heat and Mass Transfer** 104 (2017) 574-583: DOI: https://doi.org/10.1016/j.ijheatmasstransfer.2016.08.092

(22) **S. Mondal**, A. Cassano, C. Conidi, S. De, Modeling of gel layer transport during ultrafiltration of fruit juice with non-Newtonian fluid rheology, **Food and Bioproducts Processing** 100 (2016) 72-84.

(23) **S. Mondal**, M. Mohanasundaram, D.C. Sau, R.K. Gupta, M. Kumar, K.K. Paul, S. De, Modeling heat transfer of the electrothermal reactor for magnesium production, **International Journal of thermal sciences** 102 (2016) 274-284; DOI: https://doi.org/10.1016/j.ijthermalsci.2015.11.018

(24) **S. Mondal**, S. Ghosh, S. De, Atomistic level molecular dynamics simulation on the solubilization mechanism of aromatic molecules in anionic micelles, **RSC Advances** 5 (2015) 104493-104501.

(25) **S. Mondal**, S. Chatterjee, S. De, Theoretical investigation of cross flow ultrafiltration by mixed matrix membrane: A case study on fluoride removal, **Desalination** 365 (2015) 347-354.

(26) P. Debnath, A. Mukherjee, H. Singh, **S. Mondal**, Delineating seasonal porewater displacement on a tidal flat in the Bay of Bengal by thermal signature: Implications for submarine groundwater discharge, **Journal of Hydrology** 529 (2015) 1185-1197.

(27) **S. Mondal**, S. Karmakar, S. De, Modeling of cross flow microfiltration of dye loaded activated carbon in a ceramic tubular membrane module, **Canadian Journal of Chemical Engineering** 93 (2015) 2005-2014.

(28) **S. Mondal**, R. Mukherjee, S. De, Process modeling for removal of phenolic compounds from industrial wastewater using mixed matrix membrane, **Industrial & Engineering Chemistry Research** 54 (2015) 514-521.

(29) **S. Mondal**, A. Cassano, F. Tasselli, S. De, Modeling of Turbulent Cross Flow Microfiltration of Pomegranate Juice using Hollow Fiber Membranes, **AIChE Journal** 60 (2014) 4279-4291.

(30) **S. Mondal**, R. Mukherjee, S. Chatterjee, S. De, Adsorption-concentration polarization model for ultrafiltration in mixed matrix membrane, **AIChE Journal** 60 (2014) 2354-2364.

(31) **S. Mondal**, S. De, Mass transfer of a neutral solute in porous microchannel under streaming potential, **Electrophoresis** 35 (2014) 681-690.

(32) **S. Mondal**, S. De, Effects of non-Newtonian power law rheology on mass transport of a neutral solute for electro-osmotic flow in a porous microtube, **Biomicrofluidics** 7 (2013) 044113.

(33) **S. Mondal**, S. De, Mass transport in a porous microchannel for non-newtonian fluid with electrokinetic effects, **Electrophoresis** 34 (2013) 668-673.

(34) **S. Mondal**, A. Cassano, S. De, Modeling of gel layer controlled microfiltration in a radial cross flow cell, **Food and Bioprocess Technology** 7 (2013) 355-370.

(35) **S. Mondal**, Chhaya, S. De, Identification of fouling mechanism during ultrafiltration of stevia extract, **Food and Bioprocess Technology** 6 (2013) 931-940.

(36) **S. Mondal**, S. Ghosh, S. De, A molecular simulation based assessment of binding of metal ions on micelles, **Langmuir** 28 (2012) 11329-11336.

(37) **S. Mondal**, M. Dhahbi, S. De, Kinetic modeling for dye removal using polyelectrolyte enhanced ultrafiltration, **Journal of Hazardous Materials** 229-230 (2012) 381-389.

(38) S. Banerjee, **S. Mondal**, S. De, Gel controlling dead-end membrane filtration: Theory revisited, **Separation and Purification Technology** 99 (2012) 77-85.

(39) **S. Mondal,** Chhaya, S. De, Modeling of the crossflow ultrafiltration of stevia extract in a rectangular cell, **Journal of Food Engineering** 112 (2012) 326-337.

(40) Chhaya, **S. Mondal,** G.C. Majumdar, S. De, Clarifications of stevia extract using cross flow ultrafiltration and concentration by nanofiltration, **Separation and Purification Technology** 89 (2012) 125-134.

(41) **S. Mondal**, Chhaya, S. De, Prediction of ultrafiltration performance during clarification of stevia extract, **Journal of Membrane Science** 396 (2012) 138-148.

(42) Chhaya, C. Sharma, **S. Mondal**, G.C. Majumdar, S. De, Clarification of stevia extract by ultrafiltration: Selection criteria of the membrane and effects of operating conditions, **Food and Bioproducts Processing** 90 (2012) 525-532.

(43) S. Singha, U. Sarkar, **S. Mondal**, Transient Behaviour of a Packed Column of Eichhornia-Crassipes stem for the Removal of Hexavalent Chromium, **Desalination** 297 (2012) 48-58.

(44) S. Saha, U. Sarkar, **S. Mondal**, Modelling the transient behaviour of a fixed bed considering inter-pellet diffusion for adsorption of Parachloro-Meta-Xylenol (PCMX), **Desalination and Water Treatment** 37 (2012) 1-11.

(45) N. Vennela, **S. Mondal**, S. Bhattacharjee, S. De, Sherwood Number in Flow Through Parallel Porous Plates (Microchannel) due to Pressure and Electroosmotic Flow, **AIChE Journal** 58 (2012) 1693-1703.

(46) **S. Mondal**, S.B. Mlouka, M. Dhahbi, S. De, A physico-chemical model for polyelectrolyte enhanced ultrafiltration, **Journal of Membrane Science** 376 (2011) 142–152.

(47) **S. Mondal**, A. Cassano, F. Tasselli, S. De, A generalized model for clarification of fruit juice during ultrafiltration under total recycle and batch mode, **Journal of Membrane Science** 366 (2011) 295–303.

(48) **S. Mondal**, S. De, A fouling model for steady state crossflow membrane filtration considering sequential intermediate pore blocking and cake formation, **Separation and Purification Technology** 75 (2010) 222–228.

(49) **S. Mondal**, S. Dasgupta, S. Sengupta, C. Bhattacharjee, A Study Based on the Different Dosing Levels of Primary Tannery Wastewater Treatment, **Indian Journal of Environmental Protection** 30 (2010) 40-45.

(50) **S. Mondal**, S. De, Generalized criteria for identification of fouling mechanism under steady state membrane filtration, **Journal of Membrane Science** 344 (2009) 6–13.

Total citations: 761 (H-index: 17) [Source: Google Scholar]
Average Impact Factor per publication: 4.5