Soumodeep Biswas

Curriculum Vitae

Department of Chemical Engineering
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Education

2022–present **MS + PhD, Chemical Engineering**, *Indian Institute of Technology*, Madras.
Two phase millifluidic synthesis of ansiotropic Gold nanoparticles, kinetic modelling of crystal growth mechanisms in continuous flow reactors

2016-2020: **Bachelor of Technology, Chemical Technology (Technology of Oil, Fats & Surfactants)**, *Laxminarayan Institute of Technology*, Nagpur.

CGPA: **8.35/10**

2015 : **Higher Secondary Examination**, *Maharashtra State Board of Higher Secondary Education (MSBHSE)*.
Mathematics, Physics, Chemistry, Electronics and Instrumentation, English

Percentage : **86.63 %**

2013 : **Secondary Examination**, *Central Board of Secondary Education (CBSE)*.

CGPA : **9.8/10**

Research Experience

Erasmus plus exchange PhD scholar, Norwegian University of Science and Technology (NTNU)

June 2022 – present ***Continuous flow synthesis of anisotropic Gold nanoparticles using millifluidic reactor***.
Studying kinetics of crystal growth in synthesis of anisotropic Gold nanoparticles in two-phase millifluidic reactor

Advisor : **Dr. Sulalit Bandyopadhyay**, *Associate Professor, Department of Chemical Engineering*, NTNU (*Personal Web-page*)

Junior Research Fellow, Indian Institute of Technology Madras

April 2021 – December 2021 ***Light induced destabilisation of oil-in-water emulsions using light active Bolaform surfactants***.
Synthesised light active surfactant molecules containing azobenzene moiety, preparing oil-in-water emulsions stabilised by these surfactans and studying the stabilty, demonstration of destabilisation (phase separation) of these emulsions by illuminating with UV light.

Advisor : **Dr. Ethayaraja Mani**, *Associate Professor, Department of Chemical Engineering*, IIT Madras (*Personal Web-page*)

Visiting Student Researcher, Savitribai Phule Pune University

December 2019 – February 2020 ***Interfacial fragmentation of Binary Mixtures on a liquid layer driven by Marangoni instability***.
Studied droplet fragmentation driven by evaporation induced Marangoni flows using interfacial tension measurements, elctrowetting based tensiometry was learnt and used to characterise interfacial tensions at fluid-fluid interfaces .

Advisor : **Dr. Arun G. Banpurkar**, *Professor, Department of Physics*, Savitribai Phule Pune University (*Personal Web-page*)

Science Academies' Summer Research Fellow, Indian Institute of Science (IISc),Bengaluru

May 2019 – July 2019 ***Study of pressure drop and mathematical modelling of reduction of iron ore in a packed bed***.

Studied pressure drop in a cylindrical packed bed with bottom and lateral injection and verified Ergan's equation, worked on mathematical modelling of heat transfer in reduction of iron ore in a packed bed

Advisor : **Dr. Govind S. Gupta**, *Professor, Department of Materials Engineering*, IISc, Bengaluru (*Personal Web-page*)

Summer Research Internship, Indian Institute of Technology Kharagpur

May 2018 – July 2018 ***Cost-efficient synthesis of elongated copper nanowires and exploration of its application as thermal exchange fluid.***.

gained experience in preparation of elongated metal nanostructures through surfactant-mediated growth.

Advisor : **Dr. Jayanta Chakraborty**, *Associate Professor, Department of Chemical Engineering*, IIT Kharagpur (*Personal Web-page*)

Fellowships & Awards

June 2022 – present ***Erasmus plus global mobility for PhD studies*** of European Union, to fund travel and stay for 12 months for carrying out a part of PhD research at the **Department of Chemical Engineering, NTNU**, Trondheim, Norway.

May 2019 – July 2019 ***Science Academies' Summer Research Fellowship Programme 2019 (SRFP)-2019*** jointly sponsored by Indian Academy of Sciences, Indian National Science Academy and The National Academy of Sciences to carry out research at ***Deapartment of Materials Engineering, Indian Institute of Science (IISc)*** , Bengaluru, India.

Academic Achievements & Recognitions

2021 Qualified **Graduate Aptitude Test in Engineering (GATE) 2021 in Chemical Engineering (CH)** with a score of **523/1000** and secured an All India Rank of **973** (total examinees: **16705**).

Experimental skills

Equipment/ Techniques Scanning (Transmission) Electron Microscope (S(T)EM), Interfacial Tension measurement using Pendant drop method (Optical Goniometry), Dynamic Light Scattering (DLS) for particle size analysis and Zeta potential measurements, UV-Vis Spectrophometer, Bright field and inverted microscopes, Electrowetting on dielectric film for estimating interfacial tension of density matched liquid-pairs.

Computer skills

Programming Languages C, C++, MATLAB®

Publications

Biswas, S., , Karishma, S., Ramesh, B., Jeganmohan, M., Mani, E., *Light-induced destabilisation of oil-in-water emulsions using light-active bolaform surfactants*, **Soft Matter**, 2023.
`https://doi.org/10.1039/D2SM01207C`

Conferences

December 2022 **Research School for Training the Next Generation of Micro- and Nanotechnology Researchers in Norway-2022 (TNNN-2022)**, organised by NTNU, Norway.

Presented a Poster titled *Understanding the growth kinetics of anisotropic gold nanoparticles: from batch to droplet-based millifluidics*

December 2021 **Complex Fluids and Soft Matter 2021 (CompFlu 2021)**, organised by IIT Gandhinagar and the Indian Society of Rheology (ISR).
Presented a Poster titled *Synthesis of Bolaform surfactants and their use in oil-water emulsion systems*

Workshops and Certifications

November 2022 **Popular dissemination course**, at the Department of Chemical Engineering (IKP),NTNU..
Delivered a talk titled *A smart-way to destabilise emulsions* on the department day (*Video of the talk*)

June 2022 **Summer School on Sustainable and Circular Chemical Engineering**, at the Department of Chemical Engineering (IKP),NTNU within the framework of Global Erasmus Mobility Program (3 ECTS).

December 2020 **Recent Trends of pollution control strategies for wastewater treatment (RTPCSWT-2020)**, sponsored by SERB DST and organized by Department of Chemical Engineering, Jadavpur University, Kolkata.

January 2019 **Simulation and process modeling using MATLAB®**, organized by Dept. of Chemical Engineering, Visveswaraya National Institute of Technology (VNIT), Nagpur.

July 2018 – October 2018 **Computational Fluid Dynamics**, (taught by Prof. Suman Chakroborty, IIT Kharagpur), certified for successful completion of a course by National Programme on Technology Enhanced Learning (NPTEL).

Referees

Dr. Ethayaraja Mani
Associate Professor, Department of Chemical Engineering
Indian Institute of Technology Madras
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Dr.Sulalit Bandyopadhyay
Associate Professor, Department of Chemical Engineering
Norwegian University of Science and Technology
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