

Toulik Maitra

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EDUCATION

University of California, Davis | *GPA: 4.0*

Davis, CA

Doctor of Philosophy, Chemical Engineering

Sep. 2022 – 2027

- Exploring the Relationship Between Vibrational Dynamics, Electrical Mobility, and Crystallinity in Small-Molecule Organic Semiconductors using Deep Learning.
- Awards: Achieved **second place** in CHMS symposium Outstanding Poster 2023, Selected among the **top 60 students** in North America for the 26th National School on Neutron and X-ray Scattering

University of Calcutta | *GPA: 8.36/10.0*

Kolkata, India

Bachelor of Technology, Chemical Engineering

Aug. 2016 – Aug 2020

- Awards: Best paper award in IIT Kharagpur, Most innovative idea in the field of nanoscience at IIT Bombay, Among the top 10 teams (out of 2500) in Global Entrepreneurship Event organised by IIT Kharagpur.

EXPERIENCE

Graduate Student Researcher

Jan 2023 - Present

University of California, Davis

Davis, USA

- Developing a Methodological Framework for Revisiting Inelastic Neutron Spectra (INS) Analysis: An Evolving Strategy for Exploring Organic Electronic Materials (OEMs)
- DFT or MD is used for simulation and analyzing INS data but these methods have their own drawback mainly computationally expensive calculations and low accuracy in regenerating INS spectra, respectively
- The methods developed can be a great alternative to analyze and predict useful information about the OEM's crystallinity and mobility

Undergraduate Research Assistant

Feb 2018 - Dec 2021

University of Calcutta

Kolkata, India

- Synthesis and simulation studies of hierarchical nanostructures for photovoltaics and hydro chemical water-splitting.
- Mathematical modelling of Spinning basket membrane using Ansys and Python.

Business Development Intern

May 2019 – July 2019

TATA Autocomps Systems Ltd

Pune, India

- Established a business case study of a new manufacturing plant increased the revenue by 20%
- Provided an analysis to clarify the difficulties and opportunities which are in favour of the company's future growth.

Undergraduate Summer Internship

May 2018 – Dec 2018

Jadavpur University

Kolkata, India

- Optimized geometrically different combustors, which have been designed to study the effect of multicomponent diffusion transport.
- Evaluated the effect of strain rate variation and effect of velocity variation of oxidizer inlet on methane/air counterflow diffusion flame.
- Collaborated in the construction of a neural network model for fire detection, actively participating in its optimization process.

PUBLICATIONS

- Farahnaz Maleki, Karl J. Thorley, Hamna F. Iqbal, Daniel Vong, **Toulik Maitra**, Luke L. Daemen, Oana D. Jurchescu, John E. Anthony, and Adam J. Moulé. Design Rules to Optimize Intermolecular and Long-Range Packing of Organic Semiconductor Crystals. *Chemistry of Materials* 2024 36 (9), 4794-4805.
- Keka Rana, **Toulik Maitra**, Indrashis Saha, Ankit Saha, Sarani Gupta, and Debasish Sarkar. Modeling, simulation, and characterization of spinning basket membrane module in recovery of proteins from synthetic wastewater. *Journal of Water Process Engineering*, 42:102135, 2021.

- Soumyajit Maitra, Subhan Pal, **Toulik Maitra**, Somoprova Halder, and Subhasis Roy. Solvothermal etching-assisted phase and morphology tailoring in highly porous cu₂o₄ nanoflake photocathodes for solar water splitting. Energy & Fuels, 35(17):14087–14100, 2021.
- Soumyajit Maitra, Somoprova Halder, **Toulik Maitra**, and Subhasis Roy. Superior light absorbing cds/vanadium sulphide nanowalls@tio₂ nanorod ternary heterojunction photoanodes for solar water splitting. New J. Chem., 45:7353–7367, 2021.
- Soumyajit Maitra, Subhan Pal, Shyamal Datta, **Toulik Maitra**, Biswadeep Dutta, and Subhasis Roy. Nickel doped molybdenum oxide thin film counter electrodes as a low-cost replacement for platinum in dye sensitized solar cells. Materials Today: Proceedings, 39:1856–1861, 2021. 3rd International Conference on Solar Energy Photovoltaics.
- Soumyajit Maitra, Arundhati Sarkar, **Toulik Maitra**, Somoprova Halder, Kajari Kargupta, and Subhasis Roy. Solvothermal phase change induced morphology transformation in cds/cofe₂o₄@fe₂o₃ hierarchical nanosphere arrays as ternary heterojunction photoanodes for solar water splitting. New J. Chem., 45:12721– 12737, 2021.
- Soumyajit Maitra, Arundhati Sarkar, **Toulik Maitra**, Somoprova Halder, Sub- hasis Roy, and Kajari Kargupta. Cadmium sulphide sensitized crystal facet tailored nanostructured nickel ferrite @ hematite core-shell ternary heterojunc- tion photoanode for photoelectrochemical water splitting. MRS Advances, 5(50):2585–2593, 2020.

LEADERSHIP SKILLS

Founder, eCell University of Calcutta

- Built a founding team of students and led them to organize different seminars and workshops.
- Conducted 50+ interviews for better entrepreneurship opportunities.

TECHNICAL SKILLS

Languages: Python, C/C++, SQL (Postgres), R, MATLAB, PyTorch

Developer Tools: Git, Docker, VS Code, Visual Studio, PyCharm

Libraries: pandas, NumPy, Matplotlib