

Ranadip Saha

Personal Profile

A Third-Year Ph.D. candidate of Mechanical Engineering at Purdue University with research focused on thermo-electrochemical interactions and metrology in lithium-ion and lithium-metal battery chemistries.

Education

Purdue University

Ph.D. in Mechanical Engineering
GPA - 3.90/4

West Lafayette, USA

AUGUST 2023 - Present

Jadavpur University

B.E in Chemical Engineering
CGPA - 8.93/10

Kolkata, India

JULY 2019 - JUNE 2023

Experience

Purdue University

Ph.D. Student | Supervisor: Dr. Partha P. Mukherjee, Mechanical Engineering

West Lafayette, USA

August 2023 - Present

- Experimental investigation of the Thermal and Electrochemical Stability of **Lithium Metal Batteries** with Liquid Electrolytes.
- Core team member of **Center for Advances in Resilient Energy Storage (CARES)**, established as a collaboration between Purdue University and Electrochemical Safety Research Institute (ESRI)

Jadavpur University

Undergraduate Researcher | Supervisor: Dr. Achintya Mukhopadhyay, Prof., Mechanical Engineering

Kolkata, India

Feb 2021 - Jan 2023

- Designed a **0-D MATLAB-SIMULINK model** to evaluate mist-based air pre-cooling strategies for **battery thermal management**, incorporating temperature and degradation-triggered control logic.

École Polytechnique de Montréal

Mitacs Globalink Research Intern | Supervisor: Dr. David Vidal, Asst. Prof., Mechanical Engineering

Montréal, Canada

May 2022 - August 2022

- Explored deep learning approaches for **computational fluid dynamics** by generating periodic porous-media geometries and simulating flow using a **Lattice Boltzmann framework** in MATLAB.

Jadavpur University

Undergraduate Researcher | Supervisor: Dr. Sudeshna Saha, Asst. Prof., Chemical Engineering

Kolkata, India

Mar 2022 - May 2023

- Contributed to thermodynamic analysis of temperature-swing CO₂ adsorption by assisting in the development of **BNC-modified membranes** for enhanced CO₂ capture.

Publications

JOURNALS

INTERROGATING THE THERMO-ELECTROCHEMICAL INSTABILITY AND SAFETY IN LITHIUM METAL ELECTRODES WITH LIQUID ELECTROLYTES

West Lafayette, USA

Advanced Energy Materials, Wiley

Sept 2025

- Authors: **Ranadip Saha**, Anuththara S. J. Alujjage, Bairav S. Vishnugopi, Avijit Karmakar, Dhevathi Rajan Rajagopalan Kannan, Deepti Tewari, Frederick Gray, Vinay Premnath, Wan Si Tang, Judith A. Jeevarajan, Partha P. Mukherjee
- DOI: 10.1002/aenm.202504145

A CRITICAL REVIEW ON GRAPHENE AND GRAPHENE-BASED DERIVATIVES FROM NATURAL SOURCES EMPHASIZING ON CO₂ ADSORPTION POTENTIAL

Kolkata, India

Environmental Science and Pollution Research, Springer Nature

Sept 2023

- Authors: Saswata Chakraborty, **Ranadip Saha**, Sudeshna Saha
- DOI: 10.1007/s11356-023-30093-8

EARLY DETECTION AND MANAGEMENT OF THERMAL RUNAWAY IN BATTERIES USING WATER MIST FOR AIR PRE-COOLING

Kolkata, India

International Journal of Energy for a Clean Environment, Begell House

Nov 2022

- Authors: Aritra Jana, **Ranadip Saha**, Debamita Pal, Sourav Sarkar, Achintya Mukhopadhyay
- Volume 24, Issue 4, 2023, pp. 1-16
- DOI: 10.1615/InterJEnerCleanEnv.2022043273

CONFERENCES

INVESTIGATING THERMO-ELECTROCHEMICAL STABILITY OF LITHIUM METAL ELECTRODES WITH LIQUID ELECTROLYTES

The Electrochemical Society, USA

248th ECS MEETING

Oct 12-16, 2025

- Authors: **Ranadip Saha**, Anuththara S J Alujjage, Avijit Karmakar, Bairav Sabarish Vishnugopi, Dhevathi Rajan Rajagopalan Kannan, Grey Frederick, Vinay Premnath, Wan Si Tang, Judith A. Jeevarajan, Partha P. Mukherjee
- Poster presentation at the 248th ECS Meeting in Chicago.

CONTROL OF THERMAL RUNAWAY IN LI-ION BATTERIES USING WATER MIST FOR AIR PRECOOLING

Indian Institute of Chemical Engineers, India

INTERNATIONAL CONFERENCE ON ADVANCES IN CHEMICAL AND MATERIAL SCIENCES

Apr 14-16, 2022

- Authors: **Ranadip Saha**, Debamita Pal, Aritra Jana, Sourav Sarkar, Achintya Mukhopadhyay
- Presented at the International Conference On Advances in Chemical and Material Sciences ACMS - 2022, pp. 209-215

MANAGEMENT OF THERMAL RUNAWAY IN BATTERIES USING WATER MIST FOR AIR PRECOOLING

Indian Institute of Technology Madras, India

ISHMT-ASTFE Indian Heat and Mass Transfer Conference

Dec 17-20, 2021

- Authors: Aritra Jana, **Ranadip Saha**, Samriddha Ray, Debamita Pal, Sourav Sarkar, Achintya Mukhopadhyay
- Proceedings of the 26th National and 4th International ISHMT-ASTFE Heat and Mass Transfer Conference, pp. 209-215
- DOI: 10.1615/IHMTC-2021.310

OTHERS

ONLINE CONTENT LEAD

West Lafayette, USA

Purdue University

August 2024 - Present

- Manage the online website for the Energy and Transport Sciences Laboratory.
- Co-manage the online website for the Center for Advances in Resilient Energy Storage.

ONLINE BATTERY HEALTH MONITORING SYSTEM FOR ELECTRIC VEHICLES

Kolkata, India

Innovation Fair - PRAGYAJU 1.0

5th August, 2023

- Members: Saumendra Nath Mishra, Ajit Das **Ranadip Saha**, Aritra Jana, Achintya Mukhopadhyay, Sourav Sarkar, Swarnendu Sen
- Development of an IoT based cost effective, reliable online battery health monitoring system for electric vehicle which can detect and mitigate thermal runaway successfully for Lithium ion batteries
- Model successfully displayed at the Innovation Fair hosted by Intellectual Property Cell in association with Jadavpur University Entrepreneurship Cell

Skills

Experimental	Coin cell fabrication, Accelerating Rate Calorimetry (ARC), Scanning Electron Microscopy (SEM), X-ray Photoelectron Spectroscopy (XPS), Electrochemical Impedance Spectroscopy
Programming	MATLAB, Python, C, HTML
Soft Skills	Time Management, Teamwork, Problem-solving, Documentation, Engaging Presentation.

Achievements and Certifications

2025	2nd , Hawkins Student Poster Session at Purdue University	<i>USA</i>
2022	MITACS , Globalink Research Internship Award	<i>Canada</i>
2021	A+ , Industrial Training and Internship on SOLIDWORKS and ANSYS by ASD	<i>India</i>
2020	Featured , International Yuva Music Festival	<i>India</i>
2018	2nd , Environmental Quiz Competition organized by West Bengal Pollution Control Board	<i>India</i>

Interests

Music I like to indulge myself in different genres of music and have been playing sitar since 2014

Languages

English	Professional proficiency
Bengali	Native proficiency
Hindi	Bilingual proficiency
French	Basic Reading