

Debanjali Chatterjee

chatte22@purdue.edu | [Google Scholar](#) | [LinkedIn](#) | +1 (765) 426-4294

EDUCATION

Purdue University, West Lafayette, Indiana, USA

Jan 2021 - Apr 2026 (Expected)

PhD in Mechanical Engineering

Advisor: Prof. Partha P. Mukherjee

GPA 4.0/4.0

Indian Institute of Technology (IIT) Bombay, Mumbai, India

Jul 2016 - Jun 2020

B. Tech (Honors) in Mechanical Engineering

GPA 9.1/10.0

RESEARCH INTERESTS

Electrochemical Energy Storage and Conversion, Mesoscale Physics, Transport Phenomena, Renewable Energy Policy

RESEARCH EXPERIENCE

Energy and Transport Sciences Lab (ETSL) | Graduate Research Assistant

School of Mechanical Engineering, Purdue University

Jan 2021 - Present

- Investigating the coupled electro-chemo-mechanical interactions governing interface stability in solid-state batteries
- Presented a thermodynamics-guided stability landscape for solid electrolyte materials to mitigate the onset of interfacial instabilities at the Li metal anode across various stack pressures, operating temperatures and interface morphologies
- Demonstrated the role of the composite cathode microstructure in governing Li metal anode stability, revealing the critical impact of inter-electrode crosstalk on battery performance
- Studying the fundamental mechanistic interactions in alloy interlayers as an interfacial engineering strategy to enhance Li metal anode stability

INDUSTRY EXPERIENCE

TESLA | Cell Materials Engineering Intern

Boulder Fundamentals of Active Materials Team (BFAM), Colorado

Aug 2024 - Dec 2024

- Investigating transport properties and degradation mechanisms in novel electrode materials for lithium-ion batteries
- Developing a finite element-based computational framework integrating image processing & deep learning to calculate the porosity, tortuosity & active material particle size distribution in porous electrodes
- Supporting method development and design of experiments for evaluating the Li-ion diffusivity of high-capacity anode and cathode materials
- Characterizing the thermal abuse/safety response of high-capacity anode and cathode materials using Differential Scanning Calorimetry (DSC) and Thermogravimetric Analysis (TGA), identifying key degradation mechanisms under thermal runaway scenarios

PUBLICATIONS

1. **Debanjali Chatterjee**, Kaustubh G. Naik, Bairav S. Vishnugopi, and Partha P. Mukherjee. "Electrodeposition Stability Landscape for Solid-Solid Interfaces", *Advanced Science* (2023).
2. Kaustubh G. Naik*, **Debanjali Chatterjee***, and Partha P. Mukherjee. "Solid Electrolyte-Cathode Interface Dictates Reaction Heterogeneity and Anode Stability", *ACS Applied Materials and Interfaces* (2022). (***equal contribution**)
3. **Debanjali Chatterjee** and Partha P. Mukherjee. "A Science Travelogue: International Experience through the Lens of a Graduate Student and a Mentor", *Electrochemical Society Interface* (2024).
4. Susmita Sarkar*, **Debanjali Chatterjee***, Navneet Goswami, and Partha P. Mukherjee. "Celebrating Women in Electrochemical Sciences and Engineering (WIESE)", *ACS Energy Letters* (2022). (***equal contribution**)
5. **Debanjali Chatterjee**, Kaustubh G. Naik, Bairav S. Vishnugopi, and Partha P. Mukherjee. "Mechanistic Interrogation of Alloy Interlayers as a Reaction-Transport Regulator in Solid-State Batteries" (*in preparation*).

CONFERENCE PRESENTATIONS

1. **Debanjali Chatterjee**, Kaustubh G. Naik, Bairav S. Vishnugopi, and Partha P. Mukherjee. "Mechanistic Interrogation of Alloy Interlayers in Solid-State Batteries", *Materials Research Society (MRS) Fall Meeting and Exhibit 2024, Boston, MA - Accepted (Oral Presentation)*.

2. **Debanjali Chatterjee** and Partha P. Mukherjee. “Electrochemical Energy Storage and Conversion: Powering a Sustainable Future”, *Purdue Trailblazers in Engineering Fellows Poster Session 2024 (Invited Poster)*.
3. **Debanjali Chatterjee**, Kaustubh G. Naik, Bairav S. Vishnugopi, and Partha P. Mukherjee. “Role of Mechanics on Electrodeposition Stability in Solid-State Batteries”, *ASME-IMECE NSF Poster Competition, 2023 (Poster Presentation) - Best Poster Award, NSF Travel Grant Award*.
4. **Debanjali Chatterjee**, Kaustubh G. Naik, Bairav S. Vishnugopi, and Partha P. Mukherjee. “Mechanics-coupled Interface Kinetics in Solid-State Batteries”, *244th ECS Meeting, Gothenburg, Sweden, 2023 (Oral Presentation) - Symposium Travel Grant Award*.
5. **Debanjali Chatterjee**, Kaustubh G. Naik, Bairav S. Vishnugopi, and Partha P. Mukherjee. “Coupled Effect of Pressure and Temperature on Interface Stability in Solid-State Batteries”, *242nd ECS Meeting, Atlanta, GA, 2022 (Oral Presentation) - Travel Grant Award*.
6. **Debanjali Chatterjee**, Kaustubh G. Naik, Bairav S. Vishnugopi, and Partha P. Mukherjee. “Machine Learning-enabled Microstructure Design of Solid-State Battery Cathodes”, *240th ECS Meeting, Virtual, 2021 (Oral Presentation)*.
7. **Debanjali Chatterjee**, Bairav S. Vishnugopi, and Partha P. Mukherjee. “Machine Learning-based Transport Property Analytics in Porous Electrodes for Energy Storage”, *13th Beyond Lithium-ion (BLI-XIII) Conference, Virtual, 2021 (Poster Presentation) - Best Poster Award*.

LEADERSHIP AND SERVICE EXPERIENCE

President, ECS Purdue Student Chapter

The Electrochemical Society (ECS)

Aug 2021 - Dec 2023

- Led a 30-member student body dedicated to fostering research collaboration between students working in electrochemical energy storage and conversion
- Conceptualized and executed the MoChA Poster Symposium on Modeling, Characterization & Analytics in Electrochemical Sciences and Engineering, the first interdisciplinary poster competition at Purdue showcasing 15+ posters by undergraduate & graduate students and postdoctoral scholars, attended by 80+ students and faculty
- Won the Outstanding Student Chapter Award among 130+ ECS Student Chapters worldwide for pioneering efforts towards building a global scientific community in electrochemistry for energy storage and conversion

Founding Communications Director, ECS Purdue Student Chapter

The Electrochemical Society (ECS)

Jan 2021 - Jul 2021

- Initiated the signature webinar series ‘Women in Electrochemical Sciences & Engineering’ and expanded community engagement using social media amidst the COVID-19 pandemic
- Strategized social media outreach, resulting in 20k+ impressions on Twitter posts and 100+ attendees spanning North America, Europe, Africa, Australia and India
- Served as the primary liaison for webinar series, coordinating with prominent women researchers in electrochemical energy storage and conversion from industry, national labs, and academia in the US and abroad
- Authored an invited Energy Focus article in ACS Energy Letters advocating for an equitable and just transition to a resilient renewable energy network

AWARDS AND RECOGNITIONS

Trailblazers in Engineering Fellow

2024

Awarded by the Purdue University College of Engineering for outstanding scholarly contributions and potential to become a faculty member broadening participation in engineering

Outstanding Service Scholarship

2023

Awarded by the Purdue University College of Engineering for exceptional service to the graduate student community

Hommert Engineering Excellence Fellowship

2022

Awarded by the School of Mechanical Engineering, Purdue University for exceptional contributions towards enhancing diversity in engineering

Outstanding Student Chapter Award

2022

Awarded by ECS for pioneering efforts towards building a global scientific community of researchers working in electrochemical energy storage & conversion

Adelberg Fellowship

2021

Awarded by the School of Mechanical Engineering, Purdue University for pursuing graduate studies