

Debanjali Chatterjee

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GRADUATE RESEARCH ASSISTANT, SCHOOL OF MECHANICAL ENGINEERING, PURDUE UNIVERSITY

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EDUCATION

- **Purdue University**, West Lafayette, Indiana, USA
Ph.D., Mechanical Engineering *Jan '21- present*
GPA: 4.0/4.0
- **Indian Institute of Technology (IIT) Bombay**, Mumbai, India
Bachelor of Technology (Honors), Mechanical Engineering *Jul '16- Jun '20*
CPI: 9.1/10

RESEARCH INTERESTS

Mesoscale physics and Stochastics, Data-driven analytics and Machine Learning in Energy Storage & Conversion systems, Solid-state Batteries, Renewable Energy

PRESENTATIONS & PUBLICATIONS

- **Debanjali Chatterjee**, Bairav S. Vishnugopi, Kaustubh G. Naik, and Partha P. Mukherjee, "Solid-Solid Interface Stability under Kinetic Modulation", journal paper in preparation.
- Susmita Sarkar, **Debanjali Chatterjee**, Navneet Goswami, and Partha P. Mukherjee, "A Year in the Pandemic: Celebrating Women in Electrochemical Sciences & Engineering", journal paper in preparation.
- **Debanjali Chatterjee**, Bairav S. Vishnugopi, Partha P. Mukherjee, "Machine-Learning Based Transport Property Analytics in Porous Electrodes", 239th ECS meeting (Accepted-Oral Presentation)
- **Debanjali Chatterjee**, Bairav S. Vishnugopi, Kaustubh G. Naik, Partha P. Mukherjee, "Machine Learning-enabled Microstructure Design of Solid-State Battery Cathodes", 240th ECS meeting (Accepted- Oral Presentation)
- **Debanjali Chatterjee**, Bairav S. Vishnugopi, Partha P. Mukherjee, "Analysis of Transport Characteristics in Lithium-ion Battery Porous Electrodes based on Machine Learning", ASME-IMECE 2021 (Poster Presentation)
- **Debanjali Chatterjee**, Bairav S. Vishnugopi, Partha P. Mukherjee, "Machine Learning-based Transport Property Analytics in Porous Electrodes in Energy Storage", 13th Beyond Lithium-ion (BLI-XIII) Conference (Poster Presentation)

AWARDS & ACHIEVEMENTS

- Recipient of the **2021 Chapter of Excellence** award by **The Electrochemical Society (ECS)** as **President** of the **ECS Purdue Student Chapter**
 - Recipient of **ECS Travel Grants** by The Electrochemical Society (ECS) for the **239th and 240th ECS meetings**
 - Recipient of the **NSF Travel Grant** for Student Poster Symposium at **ASME International Mechanical Engineering Congress and Exposition (IMECE) 2021**
 - Recipient of the **Student Poster Session Award** at the **13th Beyond Lithium-ion (BLI-XIII) Conference**
 - Selected to participate in the prestigious **Telluride School on Interfacial Chemistry and Charge Transfer for Energy Storage and Conversion**
 - Recipient of the **Adelberg Fellowship** for Graduate studies in the School of Mechanical Engineering, Purdue University for the year of 2021
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RESEARCH
EXPERIENCE

Graduate Research Assistant

Energy and Transport Sciences Lab (ETSL), Purdue University

Advisor: Prof. Partha P. Mukherjee

School of Mechanical Engineering, Purdue University

Jan '21 - present

Studying mesoscale physics and stochastics pertaining to reactive transport phenomena coupled with electrochemistry in order to gain a fundamental understanding of materials-transport-interface interactions in energy storage

- Analyzing the **kinetic-transport-mechanics interplay** in of **solid-state battery** electrodes using **physics-based modeling** and **Machine Learning-based data-driven analytics** for property and performance attributes

Purdue Undergraduate Research Experience (PURE)

Summer Internship at the Energy and Transport Sciences Lab (ETSL), Purdue University

Supervisor: Prof. Partha P. Mukherjee

School of Mechanical Engineering, Purdue University

May '19 - Jul' 19

A Machine Learning approach towards characterizing transport properties of porous graphite electrodes using machine learning techniques

- Studied the finite volume Direct Numerical Simulation (DNS) conventionally used to extract **porosity, tortuosity and conductivity** of porous anisotropic **graphite electrodes**
- Developed **Convolutional Neural Network** models as an alternate, **faster approach** for prediction of porous media properties

OUTREACH

President, The Electrochemical Society (ECS) Purdue Student Chapter (*Aug '21-present*)

- Leading the **Student Chapter Executive Board** comprising **6 Chapter Officers** and **30+** student members under the guidance of the **Chapter Advisory Board** comprising **Professors and Industry Experts**
- Conceptualized, ideated and lead **organizer** of the **Solid-State Batteries & Electrochemistry** webinar series (Sep-Dec 2021) and the 2022 webinar series on **Modeling, Characterization & Analytics (MoChA)**
- **Primary liaison** with invited speakers, who are **prominent researchers** in the field of **electrochemical energy storage and conversion**
- Represented the Chapter as a **panelist** at the **Green Energy Panel** organized by the **Purdue Student Union Board** to create awareness and generate interest in **undergraduate students** about research in batteries and electrochemical energy storage systems being a major step towards promoting **sustainability**

Founding Communications Director, ECS Purdue Student Chapter (*Jan '21- Jul '21*)

- Key member of the Student Chapter Executive Board responsible for ideation and execution of the signature webinar series “**Women in Electrochemical Sciences & Engineering**” (**WIESE**)
- **Primary liaison** with invited speakers who were prominent **women researchers** in the field of electrochemical energy storage and conversion, from **industry, national labs and academia, both within the US and abroad**
- **Initiated and expanded social media outreach** of the Chapter through platforms like **Twitter (@EcsPurdue) & YouTube (PurdueECS Chapter)**, gaining the Chapter as well as Purdue University **worldwide recognition** in the batteries & electrochemical energy research community and helping to build virtual yet **global networks and scientific collaborations in the midst of a pandemic**
- Widespread social media outreach saw **two to three-fold increase in webinar participation** from all over the world (**Europe, Asia, Africa & Australia**), with **95% increase in Twitter engagement** and over **18k+ impressions** on Twitter posts
- Webinar recordings posted on **YouTube** have made high-quality talks by renowned scientists **accessible to all at no cost**