

EDUCATION

Cornell University Ithaca, New York

(in progress) PhD in Chemical Engineering, GPA 4.29, August 2022 – Present

NSF GRFP Fellowship Recipient

The Ohio State University Columbus, Ohio

BS in Chemical Engineering, Summa Cum Laude, with Honors in Engineering, with Honors Research Distinction in Chemical Engineering. GPA 4.00, August 2017 – May 2022

Eminence Fellowship Recipient

RESEARCH EXPERIENCE

Cornell University PhD Student

Ithaca, NY, August 2022 – Present

Graduate advisors: Professor Jeffrey Varner and Professor Jefferson Tester

- Applying ML and agent-based modeling to investigate market dynamics related to carbon emissions trading
- Experience working with large financial datasets, using Python and Julia to obtain, clean, and analyze millions of transactions from the European Union emission trading system transaction log

Fulbright Canada and MITACS Globalink Research Intern

University of Alberta, Edmonton, Alberta, May 2021 – August 2021

- Working with Prof. Vladimir Michaelis, employed high-performance computing platforms to perform a density-functional theory study to validate NMR chemical shift assignments for experimental biofuel production catalysts; utilized bash shell scripting and Python for data analysis

National Aeronautics and Space Administration Solar Energy Researcher

NASA Glenn Research Center, Cleveland, OH, January 2020 – August 2020, January 2021 – April 2021

- As part of the Photovoltaic and Electrochemical Systems Branch, worked on the improvement and application of a large area LED-based solar simulator, assisted with an investigation into perovskite-based solar cells for space use, and conducted a literature review of current electrodynamic dust screening technologies
- In a second and virtual rotation, completed a literature review of space-tested solar concentration technologies, aided design for high-altitude balloon testing of solar cells, and used SPICE circuit simulation to investigate performance improvements in perovskite-based solar cells

Computational Material Discovery Group Undergraduate Researcher

The Ohio State University, Columbus, OH, August 2019 – May 2022

- Working with Dr. Li-Chiang Lin, developed molecular dynamics simulations in LAMMPS and data analysis scripts in Python to evaluate nanoporous membranes on the basis of pore geometry for their potential use in reverse osmosis water desalination, culminating in the completion of an Honors Research Thesis in May 2022

Procter & Gamble Research and Development Intern

Cincinnati, OH, May 2019-August 2019

- Developed methods for use of chemical foaming additives to achieve structural color in PET as a sustainable alternative to traditional colorant, and with potential for UV protection applications
- Developed a procedure for evaluating crystallinity of foamed PET using differential scanning calorimetry
- Automated the photography and addition to digital database of experimental retains using Python and C++

The Ohio State University Department of Chemistry X-Ray Diffraction and UV-Visible Spectroscopy Technician

The Ohio State University, Columbus, OH, January 2019 – April 2019

- Performed XRD and UV-Vis and analyzed resulting data to characterize synthesized perovskite compounds
- Worked closely with chemistry students to teach and encourage interest in solar energy research

Procter & Gamble Research and Development Intern

Cincinnati, OH, May 2018-August 2018

- Collected data using both experimentation and simulation, and analyzed this data using Excel and JMP
- Led design of new packaging, including ideation, concept drawing, 3D modeling, and prototyping

Battelle Memorial Institute Lab Analyst

Columbus, OH, June 2017 – May 2018

- Developed and revised experimental procedures based on lab work and extensive review of literature
- Independently designed and performed modifications of living cells using CRISPR gene-editing

TEACHING EXPERIENCE**Cornell University Department of Chemical Engineering** Head Teaching Assistant

Jan. 2023 – May. 2023

- *Fluid Mechanics*: Taught a weekly one-hour recitation section, designed assignments and exams, independently taught two main course lectures, and led an instructional team of eight teaching assistants

The Ohio State University Department of Chemical Engineering Teaching Assistant

Aug. 2019 – Dec. 2019, Aug. 2020 – Dec. 2020, Jan. 2021 – Apr. 2021, Aug. 2021 – May 2022

- *Separation Process*: Mathematical and heuristic analysis of chemical and physical separation processes
- *Transport Phenomena I*: Momentum transport, derivation and application of fluid mechanics PDEs
- *Thermodynamics*: Mass, energy, and entropy balances, heat engines, and multicomponent systems
- *Kinetics and Reactor Design*: Linear algebra of coupled reaction networks and chained reactor design

HONORS & AWARDS**National Science Foundation – Graduate Research Fellowship (NSF-GRFP) (2023)**

- In support of five years of graduate research at Cornell University

Outstanding Student Award (2022)

- Presented by the Department of Chemical and Biomolecular Engineering at The Ohio State University

Fulbright Canada – Mitacs Globalink Program (2020)

- Summer 2020 awardee; cancelled due to COVID-19 pandemic

Eminence Scholarship at The Ohio State University (2017-2022)

- Full cost of attendance fellowship awarded to ~20 students annually, emphasizing research, leadership, and service

Churchill Scholarship Nominee – Ohio State University Nominee (2021)

- One of two nominees selected by The Ohio State University to be put forward for the Churchill Scholarship

PRESENTATIONS**Conference Presentations:**

Molecular Dynamics Evaluation of Pore Geometry in Nanoporous Membranes..., November 2021, AIChE ASC 2021

DFT Computations of Active Site Complexes in the ... Epimerization of Glucose; August 2021, IUPAC CCCE 2021

SERVICE**The Adaptive Adventure Sports Coalition**

- As my Eagle Scout Project, planned and led the construction of a 100-foot accessible pathway at TAASC, an organization that empowers people with disabilities to enjoy adventure sports such as kayaking and skiing

Franklin County Medical Reserve Corps

- Aided in distribution of COVID-19 vaccines and test kits to community members with disabilities and of old age

AIChE Mentorship Program

- Serving as an external mentor for my former AIChE chapter at Ohio State, advising aspiring researchers