

EDWARD COLEMAN FLUKER

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EDUCATION:

University of Pennsylvania, School of Engineering and Applied Science
Doctor of Philosophy, Chemical Engineering
PI: Dr. Dohyung Kim

Exp. May 2029

Syracuse University, College of Engineering and Computer Science
Bachelor of Science, Chemical Engineering
Minor: Physics

May 2024
GPA: 3.97

HONORS & AWARDS:

National Science Foundation Graduate Research Fellow (NSF GRFP)

National GEM Consortium Fellow

2024 Syracuse University Scholar

Penn Engineering Dean's Doctoral Fellow

Tau Beta Pi Engineering Honor Society, New York Beta Chapter

Penn Fontaine Society Fellow

RESEARCH EXPERIENCE:

Undergraduate Research, Iot4Ag REU, University of Pennsylvania May 2023 – August 2023

- Investigated the optimization of electrochemically active surface area in Ag-based cathodes to reduce cost and improve power density in aluminum air batteries.
- Presented poster at UPenn REU symposium and wrote manuscript.

Undergraduate Research, LSAMP REU, Syracuse University June 2022 – August 2022

- Investigated Calcium Ion conduction in polymer-based electrolytes for the Hosein Research Group, presented findings at the Syracuse SOURCE Research Symposium to 100+ attendees.
- Strengthened proficiency in data collection, manipulation, visualization and safe work and laboratory practices.
- Project led to publication as the first author in the ACS Journal of Physical Chemistry C where we reported one of the highest ionic conductivities for polymer electrolytes.

LSAMP Research Scholar, Syracuse University, Syracuse, NY September 2022 – June 2023

- Performed electrochemical characterization of methylimidazole electrolytes for the Hosein Research Group.
- This research expands the work started in the LSAMP Summer REU program.
- Worked on writing manuscript from previous project which became published.

PROFESSIONAL EXPERIENCE:

Advanced Manufacturing Analytics Intern, Cargill Inc.

May 2024 – August 2024

- Developed package of algorithms detecting false manufacturing data in Seeq and delivered to over 5 users within Cargill.

- Gained experience in unsupervised machine learning through literature review and hands on research.
- Presented two 15-minute final project presentations to R&D leadership within Cargill.

AEW Facilitator, *Syracuse University College of ECS* August 2021 – May 2024

- Taught 6 semesters as an undergraduate peer educator in weekly collaborative workshop sessions to support 6-8 engineering students enrolled in Calculus 3, DiffEQ/Matrix Algebra, Mass & Energy Balances, and Thermodynamics.
- Designed workplans for 6 semesters to improve and enhance student understanding of classwork via collaborative workshops that feature group work on problems concurrent with course instruction.
- Consistently awarded positive feedback from over 30 student evaluations as an effective facilitator.

Tutor, *Varsity Tutors*, Remote June 2021 - September 2021

- Adapted teaching style to meet needs of clients leading to a top rating on tutoring platform.
- Created individualized learning plans for 10 high school and college students, leading to enhanced mastery of calculus, physics, and chemistry.
- Developed engaging, interactive, and effective communication techniques customized for online learning.

UNIVERSITY SERVICE:

President, *Engineering World Health Syracuse University Chapter* August 2021 – May 2024

- Hosted soldering and device building sessions for up to 20 students to build electrocardiogram simulators and heart rate monitoring kits.
- Planned weekly events and workshops with executive board and collaborate with on-campus organizations to plan large events.
- Managed chapter finances and coordinate with college Office of Student Activities.

Treasurer, *American Institute of Chemical Engineers SU Chapter* August 2021 - May 2024

- Planned monthly professional development, social, and educational events.
- Recruited chemical engineering students to get involved in research, participate in conferences, and provide mentorship.
- Managed chapter finances and coordinate with college Office of Student Activities and college of Engineering & Computer Science.

POSTERS AND PRESENTATIONS:

- *Investigating Calcium-Ion Conduction in PVDF-based Electrolytes*, 2023 AIChE Undergraduate Student Poster Competition
- *Optimization of Electrochemically Active Surface Area in Ag-based Cathodes to Improve Power Density in Aluminum Air Batteries*, University of Pennsylvania Summer 2023 REU Symposium
- *Solid Polymer Electrolytes for Calcium Ion Batteries*, Syracuse University SOURCE Summer 2022 Symposium
- *Investigating Calcium-Ion Conduction in PVDF-based Electrolytes*, Syracuse University LSAMP Spring 2023 Symposium

PUBLICATIONS:

- *Polyvinylidene Fluoride-Based Gel Polymer Electrolytes for Calcium Ion Conduction: A Study of the Influence of Salt Concentration and Drying Temperature on Coordination Environment and Ionic Conductivity*, Edward C. Fluker, Shreyas Pathreker, and Ian D. Hosein, *The Journal of Physical Chemistry C* 2023 127 (33), 16579-16587, DOI: 10.1021/acs.jpcc.3c02342
- *Cost-Effective Microfabricated Silver-Based Paper Cathodes for High-Discharge-Rate Aluminum-Air Batteries*, Yanghang Huang et al 2024 Meet. Abstr, ECS Meeting Abstracts, Volume MA2024-01, I03: Materials for Low Temperature Electrochemical Systems 10, DOI: 10.1149/MA2024-01362113mtgabs
- *Design of a Boron-Containing PTHF-Based Solid Polymer Electrolyte for Sodium-Ion Conduction with High Na⁺ Mobility and Salt Dissociation*, Francielli Silva Genier, Shreyas Pathreker, Paige Olufunmilayo Adebo, Paul Chando, and Ian Dean Hosein, *ACS Applied Polymer Materials* 2022 4 (10), 7645-7663. DOI: 10.1021/acsapm.2c01276 (Acknowledged for Experimental Contribution)