JOSHUA P. HAZELNIS

www.linkedin.com/in/jphazelnis ● Jphazeln@umich.edu

EDUCATION

University of Michigan — Ann Arbor, MI
Ph.D. Candidate in Chemistry — *Anticipated May 2025*

University at Buffalo — Buffalo, NY
Bachelor of Science in Chemical Engineering · Bachelor of Arts in Chemistry — *May 2020*
GPA: 3.91 · Dean's List 2016 - 2020

RESEARCH EXPERIENCE

University of Michigan, Professor Stephen Maldonado — Ann Arbor, MI
Graduate Student Researcher — *August 2020 - Present*

- Perform in-situ X-Ray reflectivity experiments of liquid metal interfaces under potential control.
- Electrodeposit the first known ordered metallic structures at a liquid metal/electrolyte interface.
- Materials characterization of synthesized metallic and semiconductor particles and films.

University at Buffalo, Professor Timothy R. Cook — Buffalo, NY
Undergraduate Research Assistant — *September 2017 – May 2020*

- Investigated the utilization of redox-flow batteries for non-aqueous electrolyte systems.
- Aided in the assembly and optimization of University at Buffalo's first working redox-flow battery.
- Investigated membrane conductivity and selectivity using 4-electrode impedance spectroscopy.

University at Buffalo, Professor Carl R. F. Lund — Buffalo, NY
Undergraduate Research Assistant — *February 2017 – May 2017*

- Researched the propagation and reaction fronts in oxygen generating chlorate candles using MATLAB.

PUBLICATIONS

(1) **Hazelnis, J. P.**, Wu, H., Nguyen, T., and Maldonado, S. "Epitaxial Electrosynthesis of Germanium Films from Liquid Metal Electrodes at Ambient Conditions." (In-Preparation)

(2) Wu, H.; **Hazelnis, J. P**., Maldonado, S. (2024). "Electrochemical Liquid-Liquid-Solid Growth of Ag-In Crystals with Liquid Indium Alloy Electrodes." ChemElectroChem, ASAP

(3) **Hazelnis, J. P.** and Maldonado, S. (2023). "Electrosynthesis of Quasi-Epitaxial Crystals on Liquid Metals." Journal of the American Chemical Society 145(50): 27616-27625.

(4) **Hazelnis, J. P.**, Wu, H., Maldonado, S. (2023). "Understanding and Expanding the Prospects for Electrosynthesis with Liquid Metal Electrodes." Accounts of Chemical Research.

(5) **Hazelnis, J. P.,** Sartori, A., Cheek, Q. B., Giri, R. P., MacInnes, M. M., Murphy, B. M., Magnussen, O. M., Maldonado, S., et al. (2022). "Detection of Ge-Containing Adlayers at the Liquid Hg/Water Interface by In Situ X-ray Reflectivity in Aqueous Borate Electrolytes Containing Dissolved GeO2." The Journal of Physical Chemistry C 126(18): 8177-8189.

(6) Kosswattaarachchi, A. M.,VanGelder, L. E., Nachtigall, O., **Hazelnis, J. P.**, Matson, E. M., Cook, R. T. et al. (2019). Transport and Electron Transfer Kinetics of Polyoxovanadate-Alkoxide Clusters, The Electrochemical Society. 166.

PRESENTATIONS

U-M/Agilent Symposium on Measurement Science Oral Presentation — Ann Arbor, MI
Title: *In Situ XRR in Aqueous Sodium Tetraborate Solutions of Liquid Hg-In Alloy Electrodes* — *Spring, 2024*

Pittcon 2024 (Invited Oral Presentation) — San Diego, CA
Title: *Electrosynthesis of Quasi-Epitaxial Crystals on Liquid Metals* — *Winter, 2024*

ECS Detroit Section Meeting Poster Presenter — Detroit, MI
Title: *Quasi-Epitaxial Metal Electrodeposition at a Liquid Metal Electrode* — *Summer, 2023*

Electrochemistry Gordon Research Conference Poster Presenter — Ventura, CA
Title: *Liquid Metal Electrodes as Growth Media for Single-Crystalline Metal Films & Superlattices* — *Fall, 2022*

American Chemical Society (ACS) Oral Presentation — Chicago, IL
Title: *In-Situ electrochemical X-Ray reflectivity of liquid metal-electrolyte interfaces* — *Fall, 2022*

Transforming Our Tomorrow 2019: A New Clean Energy Vision Oral Presentation — Buffalo, NY
Title: *Jeans for Renewable Energy Storage* (1st Place & Social Innovation Award) — *Spring 2019*

WYNACS Undergraduate Research Symposium — Buffalo, NY
Title: *The Molecular Chemistry of Redox Flow Batteries* (1st Place) — *Spring 2018*

CURCA: Celebration of Student Academic Excellence Poster Presenter — Buffalo, NY
Title: *The Molecular Chemistry of Redox Flow Batteries* — *Spring 2018*

PROFESSIONAL EXPERIENCE

University of Michigan ECS Student Chapter — Ann Arbor, MI
Secretary — *May, 2023 - Present*
- Assist with the organization and administrative task of the first ever ECS student chapter club.

University of Michigan, Maldonado Research Group — Ann Arbor, MI
Safety Officer and Inventory Manager — *May, 2020 – January, 2024*
- Oversaw the safety practices of the laboratory and address identified safety deficiencies.
- Managed grants and funds of the laboratory to order necessary items, instruments, and chemicals.

University of Michigan, Chemistry — Ann Arbor, MI
Graduate Student Mentor — *August, 2023 – May, 2023*
- Facilitated helpful discussion and guidance for an incoming first year graduate student.

Buffalo Public Schools — Buffalo, NY
Volunteer Engineering Adviser — *September 2019 – May 2020*
- Consulted on the design small scale classroom demonstrations on renewable energy storage.

University at Buffalo Campus Living — Buffalo, NY
Resident Advisor — *October 2017 – May 2019*
- Maintained an active and supportive leadership role by being a resource for dormitory residents.

INTERNSHIP EXPERIENCE

Wendel Energy Services, LLC — Williamsville, NY
Intern — *June 2018 – September 2018*
- Optimized the energy expenditures for capital improvement projects across the United States.
- Proposed the innovation of existing chillers, HVAC, lighting, insulation and fume hood systems.
- Calculated utility efficiency using AutoCAD, Bluebeam, Hoboware and Microsoft EXCEL.

AWARDS & HONORS

University of Michigan 3rd Year Seminar Travel Award	*Spring 2023*
National Science Foundation Graduate Student Fellowship (NSF GRFP) Awardee	*Spring 2020*
Inaugural Professor Edward P. Furlani Scholarship	*Spring 2019*
Transforming Our Tomorrow 2019 Competition - First Place and Social Innovation Award	*Spring 2019*
Ralph F. Theuer Scholarship	*Spring 2019*
William E. Townsend Scholarship	*Spring 2019*
Peter T. Lansbury Award	*Spring 2019*
WNYACS Undergraduate Research Symposium - First Place Poster Presenter	*Spring 2018*
UB CURCA Undergraduate Research Award	*Spring 2018*
Provost Scholarship	*Spring 2018*

LABORATORY TECHNICAL SKILLS

- Materials Electrodeposition
- X-Ray Diffraction (XRD)
- Python Data Modeling
- Beamline Data Collection
- X-Ray Reflectivity (XRR)
- Cyclic Voltammetry (CV)
- Selected Area Electron Diffraction (SAED)
- Plasma Focused Ion Beam Manipulation (PFIB)
- Transmission Electron Spectroscopy (TEM)
- Air-Free Glovebox Proficiency
- X-Ray Photoelectron Spectroscopy (XPS)
- Electron Back Scattered Diffraction (EBSD)
- Inductively Coupled Plasma Mass Spec (ICP-MS)
- Raman Spectroscopy
- X-Ray Fluorescence Spectroscopy (XRF)
- Linear Sweep Voltammetry
- Scanning Electron Microscopy (SEM)
- Electrochemical Cell Design

COMPUTATIONAL TECHNICAL SKILLS

Coding Languages: Python, MATLAB

Software Proficiencies: VESTA, EC-Lab, Microsoft Office, EXCEL, Powerpoint, Adobe Illustrator, Origin, Jana2006, GATAN, Velox, ImageJ, AutoCAD, Fusion 360

CERTIFICATIONS

EHS Laboratory Safety Training	*November 2019 – Present*
Black Belt in the art of Tang Soo Do	*June 2014*

PROFESSIONAL AFFILIATIONS

The Electrochemical Society (ECS)	*2023 – Present*
American Chemical Society (ACS)	*2019 - Present*
American Institute of Chemical Engineers (AIChE)	*2019 – 2020*