BENJAMIN LAUBACH

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Education

University of Michigan, Ann Arbor **Expected Graduation: May 2028**

Doctor of Philosophy in Chemical Engineering and Scientific Computing

- National Science Foundation Graduate Research Fellowship (NSF-GRFP)

Master of Science in Engineering - Chemical Engineering **Graduation: May 2024**

Michigan State University **Graduation: May 2023**

Bachelor of Science - Chemical Engineering with Honors **GPA: 3.90/4.00**

Professional & Research Experience

Google X **Jan. 2026 – Jun. 2026**

PhD Resident – AI for Chemistry with Dr. John Paul Issa, Thomas Hossler, and Prof. Gabe Gomes

- Architected and deployed an end-to-end MLOps pipeline on Google Cloud Platform (GCP) to execute large-scale machine learning inference on 1M+ partner data points.

Los Alamos National Laboratory **Jun. 2025 – Aug. 2025**

Graduate Research Intern with Dr. Ying Wai Li and Dr. Christopher Lane

- Integrated complex reward and acceleration methods into a Monte Carlo Tree Search Algorithm for the inverse design and discovery of heavy fermion (superconducting) compounds.

University of Michigan-Ann Arbor **May. 2023 – Current**

Graduate Research Assistant with Prof. Rebecca Lindsey

- Developed methods for uncertainty quantification method for simulations using machine-learned interatomic potentials (ML-IAP); collaboration with Lawrence Livermore National Laboratory.

University of Wisconsin-Madison **Jul. 2021 – May 2023**

Undergraduate Research Assistant with Prof. Victor Zavala

- Applied Riemannian Geometry to various case studies in collaboration with Dow Chemical. Determined key process variables affecting multivariate time series batch processes. Collaboration with Argonne National Laboratory.

Dow Chemical Company **May 2021 – Aug. 2022**

Alternating Term Co-op

- Scaled batch production by 25.8% (adding ~$800k/yr profit), reduced waste by 40% through a Python cleanout model, led capital investment projects, and identified unsustainable SiH-containing products that saved ~$10k per trailer.

Michigan State University **Aug. 2021 – May 2023**

Undergraduate Research Assistant with Prof. John Dorgan

- Utilized classification algorithms to sort plastics based on Near Infrared Spectroscopy (NIR) data.

Michigan State University **Jan. 2020 – May 2020**

Undergraduate Research Assistant with Prof. Milton Smith

- Focused on iridium-catalyzed C-H borylation chemistry with an emphasis on coupling reactions. Included a prioritization of green chemistry with a focus on optimization.

Awards

- Feb. 2025 – 2nd place Business + Tech Data Download and Datathon Competition
- Apr. 2024 – National Science Foundation Graduate Research Fellowship
- Nov. 2022 – 1st overall in Computing and Process Control, 2022 AIChE Annual Meeting Poster Competition
- Sep. 2022 – Bernard A. & Joan L. Paulson Scholarship
- Sep. {2022, 2021, 2020} – Maurice G. and Sara V. Larian Scholarship
- Sep. {2022, 2020} – David L. and Denise M. Lamp Engineers of Tomorrow Endowment Scholarship
- Jun 2019 – Sergio Marchionne Student Achievement Scholarship
- Jun. 2019 – Pinnacle Award Scholarship
- Jun. 2019 – Booster Award Scholarship

- Jun. 2019 – Credit Union One Scholarship

Publications

- **Laubach B.,** Liu S., Allen K., Riedel Z., Watkins A., Rosa P., Thomas S., Bauer E., Ronning F., Lindsey R., Zhu J., Lane C., Li Y., *Machine learning accelerated monte carlo tree search for inverse design of quantum materials.* In preparation.
- **Laubach B.,** Vita J., Bushick K., Williams L., Lindsey R., Lordi V., *Entropy-guided dataset optimization for machine-learned interatomic potentials.* In preparation.
- Oladipupo A., **Laubach B.,** Almohri S., Lindsey R., *TurboChIMES: Multi-Layered Machine-Learned Interatomic Models for Enhanced Simulation Efficiency.* Submitted.
- Vita J., Stimac J., Williams L., Fan Y., Buschick K., Hamel S., Samanta A., **Laubach B.**, Lindsey R., Lordi V., *Cluster-based Bayesian optimization for application-specific interatomic potential training.* Submitted.
- **Laubach B.,** Lordi, V., Lindsey R., *Cluster-Graph Fingerprinting: A Framework for Quantitative Analysis of Machine-Learned Interatomic Model Training and Simulation Data*. ChemRxiv. 2025; doi:10.26434/chemrxiv-2025-vr0cs
- Smith, A., **Laubach, B.,** Castillo, I. & Zavala, V. M., *Data analysis using Riemannian geometry and applications to chemical engineering. Computers & Chemical Engineering* 168, 108023 (2022).

Presentations

2025 University of Michigan Chemical Engineering Graduate Symposium – Oral Presentation **Sep. 2025**
Inverse design of heavy fermion compounds using monte carlo tree search
2025 Conference on Data Analysis – Poster Presentation **Apr. 2025**
A New Configuration Fingerprinting Method for Improved Data Selection and Uncertainty Quantification in Machine Learned Interatomic Models
2024 AIChE Annual Meeting – Oral Presentation **Jun. 2024**
Evaluating Machine-Learned Interatomic Models through Graph-based Descriptor Analysis
2024 Midwest Thermodynamics and Statistical Mechanics Conference – Poster Presentation **Jun. 2024**
Detection Toward trustworthy and robust simulation with machine-learned interatomic models: New strategies for quantifying configuration novelty
2022 AIChE Annual Meeting – Undergraduate Poster Competition **Nov. 2022**
Utilizing the Euler Characteristic for Extreme Event Detection

Leadership Experiences

University of Michigan | VP of {Deal Flow, Non-MBA} – *Zell Lurie Commercialization Fund* **Sep. 2024 – Current**
- Identified young startups for early-stage investment with check sizes ranging from 50K~150K.

University of Michigan | Consultant – *miLEAD Consulting Group* **Sep. 2024 – Current**
- Solved complex problems facing partners through team-driven, short-term, research projects.

University of Michigan | President, Vice President – *Chemical Engineering Graduate Society* **Dec. 2023 – Dec. 2025**
- Facilitate initiatives within the chemical engineering graduate department to support student needs.
- Volunteered for the local Peace Neighborhood Center to promote STEM education.

Michigan State University | Founder – *Chemical Engineering Introductory Project* **Dec. 2020 – May 2023**
- Created an extracurricular activity to teach prospective engineering students' technical skills through hands-on learning.

Michigan State University | *Resident Assistant* **Mar. 2020 – May 2023**
- Assisted in supporting an on-campus residential community and have specific responsibility for connecting with students in a particular area. RAs work to establish inclusive communities that foster student academic and social success.

Michigan State University | President – *AIChE* **Sep. 2019 – May 2023**
- Represented AIChE while networking for chemical engineering companies and professionals.

Michigan State University | *Honors College Activities Board* **Sep. 2019 – Mar. 2020**
- Collaborated with MSU students to host events for honors college members.

Michigan State University | *Fluid Flow and Heat Transfer Grader* **Aug. 2022 – May 2023**
- Provided constructive feedback to students for Fluid Flow and Heat Transfer homework.

Volunteering

Michigan State University | *Tower Guard* **Mar. 2020 – Aug. 2021**

- Tower Guard is a sophomore student organization dedicated to serving 60 volunteer hours to the Resource Center for Persons with Disabilities (RCPD) at Michigan State University.

Michigan State University | *Honors College Impact* **Aug. 2019**

- Week-long volunteering event hosted by the Honors College to help the greater Lansing community.

Oakland University | Co-facilitator - *OUCares Volunteer* **Oct. 2018 – Jan. 2019**

- Volunteered to teach children with autism computer programming through Lego Robotics.

Relevant Coursework

Machine Learning

- Machine Learning, Graduate **Fall 2024**
- Computational Modeling Tools and Techniques **Winter 2023**
- Introduction to Computational Modeling (MATLAB) **Fall 2022**

Computer Science

- Parallel Computing, Graduate **Fall 2025**
- Parallel Computer Architecture, Graduate **Winter 2025**
- Introduction to Programming II (C++) **Winter 2022**
- Introduction to Programming I (Python) **Fall 2021**

Simulations

- Statistical and Irreversible Thermodynamics, Graduate **Fall 2023**
- Simulation of Condensed Liquids, Graduate **Fall 2023**

Mathematics

- Modern Bayesian Data Science, Graduate **Winter 2024**
- Applied Mathematics for Chemical Engineers, Graduate **Fall 2023**
- Differential Equations **Fall 2020**
- Multivariable Calculus **Winter 2020**

Professional Skills

Coding Proficiencies

- Python (Intermediate – Advanced), C++ (Intermediate), MATLAB (Intermediate), Jupyter (Intermediate-Advanced), Bash (Intermediate)
- High performance computing (Greatlakes, Stampede3, LLNL, LANL), cloud computing (GCS)