# LEAH FORD

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## EDUCATION

**The Ohio State University** Columbus, OH

*Ph.D. in Chemical and Biomolecular Engineering (05/2025)*
*Master of Science in Chemical and Biomolecular Engineering (08/2022); GPA: 3.86/4.0*
**Key Coursework:** Advanced Transport, Advanced Thermodynamics, Analysis of Chemical and Biomolecular Engineering Problems, Advanced Kinetics, Research Communications, Design of Experiments, Sustainable Engineering, Nuclear Magnetic Resonance Spectroscopy, Fuel Cells

**University of South Carolina, Honors College** Columbia, SC
*Bachelor of Science in Chemical Engineering (05/2020); GPA: 3.96/4.0*
**Key Coursework:** Thermodynamics, Fluid Mechanics, Heat Transfer, Mass Transfer, Materials, Separation Process Design, Chemical-Process Dynamics and Controls, Chemical Engineering Kinetics, Chemical-Process Analysis and Design, Chemical-Process Safety, Unit Operations Laboratory, Organic Chemistry, Inorganic Chemistry, Biochemistry, Statics, Dynamics, Electrical Engineering for Non-Majors, Statistics for Engineers, Engineering Ethics

## RESEARCH EXPERIENCE

**The Ohio State University** Columbus, OH August 2020 – Present
*Graduate Research Fellow under Nicholas Brunelli, Ph.D.*

- Established synthesis-structure-activity relationships for zeolites to design effective catalysts for industrially-valuable reactions.
- Collaborated with and mentored lab group members to safely and efficiently conduct research.
- Presented research routinely at various chemical engineering and catalysis conferences.

**Virginia Tech** Blacksburg, VA May 2019 – August 2019
*National Science Foundation Undergraduate Research Fellow under Zhen He, Ph.D.*

- Investigated the integration of microalgae into an osmotic photo-bioreactor for effective tertiary wastewater treatment to improve water quality worldwide.
- Participated in weekly professional development activities to improve scientific communication skills, culminating in a research presentation to students and faculty, a poster presentation at a campus-wide symposium, and a 15-page research report.

## PUBLICATIONS

**Ford, L.**; Spanos, A.; Brunelli, N. A. Counting Sites in Lewis Acid Zeolite Sn-Beta: Connecting Site Quantification Experiments and Spectroscopy to Investigate the Catalytic Activity for the Alcohol Ring Opening of Epoxides. *ACS Catal.* **2023**, *13*, 11422-11432.

Kasula, M.; Spanos, A. P.; **Ford, L.**; Brunelli, N. A. Investigating the Impact of Synthesis Conditions to Increase the Yield and Tin Incorporation Efficiency for Lewis Acid Nano-Sn-MFI Zeolites. *Ind. Eng. Chem. Res.* **2022**, *61* (5), 1977-1984.

## ORAL CONFERENCE PRESENTATIONS

**Leah Ford,** Alexander Spanos, and Nicholas Brunelli (2023). "Determination of catalytic site distributions and contributions for epoxide ring opening in Lewis acidic zeolite Sn-Beta." American Institute of Chemical Engineers Annual Meeting. Orlando, FL.

**Leah Ford,** Alexander Spanos, and Nicholas Brunelli (2023). "Counting Catalytic Sites in Lewis Acid Zeolite Sn-Beta for Epoxide Ring Opening Reactions." Ohio State Chemical and Biomolecular Engineering Graduate Research Symposium. Columbus, OH. **1st-Place Oral Presentation Award.**

**Leah Ford,** Alexander Spanos, and Nicholas Brunelli (2022). "Quantifying active catalytic sites in Lewis acidic zeolite Sn-Beta." American Institute of Chemical Engineers Annual Meeting. Phoenix, AZ.

## POSTER CONFERENCE PRESENTATIONS

"Quantifying active catalytic sites in Lewis acidic zeolite Sn-Beta." The 28th North American Catalysis Society Meeting. Providence, RI. June 2023. **Richard J. Kokes Travel Award.**

"Combining site poisoning experiments with NMR to determine catalytic site distributions and contributions for epoxide ring opening in zeolite Sn-Beta." Ohio State Materials and Manufacturing Conference. Columbus, OH. May 2023. **Top-10 Poster Presentation Award.**

"Quantifying active catalytic sites in Lewis acidic zeolite Sn-Beta." Ohio State Department of Chemical and Biomolecular Engineering Graduate Research Symposium. Columbus, OH. September 2022. **3rd-Place Poster Presentation Award.**

"Quantifying active catalytic sites in Lewis acidic zeolite Sn-Beta." Tri-State Catalysis Symposium. Columbus, OH. September 2022.

"Quantifying catalytic sites in Lewis acid zeolite Beta." The 27th North American Catalysis Society Meeting. New York City, NY. May 2022.

"Understanding the effect of poisons in zeolite Sn-Beta active site quantification." Ohio State Department of Chemical and Biomolecular Engineering Graduate Research Symposium. Columbus, OH. September 2021.

"Cultivation of Microalgae in an Osmotic Photo-Bioreactor for Wastewater Treatment and Agricultural Reuse." Virginia Tech Summer Research Symposium. Blacksburg, VA. August 2019.

## FELLOWSHIPS AND SCHOLARSHIPS

**University Fellowship** (2021-2022). The Ohio State University.

**Robert S. Brodkey Scholarship** (2021). The Ohio State University.

**Michael and Nanette Triplett Graduate Fellowship** (2020-2021). The Ohio State University.

**William A. Mould and Peter C. Sederberg Scholarship** (2019-2020). University of South Carolina Honors College.

**Academic Scholar – Elite Scholarship** (2016-2020). University of South Carolina.

**M. Bert Storey Engineering Scholarship** (2016-2020). University of South Carolina.

## PATENTS

*Using organometallic precursors to produce zeolitic material with open-defect sites.* N. Brunelli, A. Spanos, **L. Ford** (US2023/034746). Patent pending.

*Zeolitic materials and methods of making and using thereof.* N. Brunelli, A. Spanos, A. Kulkarni, **L. Ford** (US2023/034747). Patent pending.

## LEADERSHIP EXPERIENCE

**Ohio State Chemical Engineering Graduate Council** August 2022 – August 2023

- Joined the council as the recruiting officer after being nominated and elected by fellow students in the chemical and biomolecular engineering department.
- Planned social events to facilitate a healthy departmental culture for faculty, staff, and graduate students.
- Distributed critical information regarding events to faculty, staff, and graduate students.
- Coordinated events for prospective graduate students to engage with current department members.

**Catalytic Material Design Group Lab Safety Officer** August 2022 – August 2023

- Completed tasks in the lab space to ensure cleanliness and safety including (1) initiating chemical waste pickup, (2) checking safety equipment and supplies routinely, and (3) updating and maintaining lab documents related to safety and organization.
- Trained new lab members on good safety practices and enforced these practices in the lab.

## EXTRACURRICULAR ACTIVITIES

**The Ohio State University Triathlon Club** August 2022 – Present

- Participated in team activities with the goal of improving performance in swimming, cycling, and running.

**University of South Carolina Cross Country/Track and Field** August 2016 – May 2020

- Managed a schedule that included practices, weight training sessions, team meetings, and competitions to improve competitive running performance and improve the program's ranking.

## VOLUNTEER EXPERIENCE

**Scientific Thinkers** Columbus, OH February 2023 – Present

- Taught scientific concepts to 3$^{rd}$, 4$^{th}$, and 5$^{th}$ graders by combining discussion with interactive lessons.
- Fostered an environment for curiosity to encourage students to grow interest in STEM subjects.

**Habitat for Humanity MidOhio** Columbus, OH September 2022 – Present

- Joined "Young Professionals," a group of volunteers that gathered biweekly to complete tasks related to the Habitat for Humanity mission.
- Helped construct and perform maintenance on homes for those who are unable to afford traditional mortgages.
- Helped construct outdoor playsets to contribute to fundraising for building supplies.

**Central South Carolina Habitat for Humanity** Columbia, SC November 2016 – May 2020

- Joined the University of South Carolina Habitat for Humanity campus chapter.
- Helped construct and perform maintenance on homes for those who are unable to afford traditional mortgages.
- Organized donated furniture and building materials in the Habitat for Humanity ReStore.

## LABORATORY SKILLS

- Colorimetry
- Gas chromatography equipped with flame ionization detector
- Gas chromatography equipped with mass spectrometer
- Inductively coupled plasma optical emission spectroscopy
- Infrared spectroscopy
- Ion chromatography
- Nitrogen physisorption analysis
- Nuclear magnetic resonance spectroscopy
- Spectrophotometry
- Thermogravimetric analysis with differential scanning calorimetry
- Ultraviolet/visible light spectroscopy
- Water adsorption analysis
- X-ray diffraction

## STATISTICAL AND COMPUTER EXPERIENCE

- AutoCAD
- Aspen HYSYS
- ChemDraw
- ChemSep
- IGOR
- JMP
- MATLAB
- Microsoft Office
- Polymath
- R
- TopSpin

## REFERENCES

**Nicholas Brunelli**, Ph.D. (Graduate Advisor)
Department of Chemical and Biomolecular Engineering
The Ohio State University
Phone: (614) 688-3400
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**Zhen He**, Ph.D. (REU Advisor)
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**Jochen Lauterbach**, Ph.D. (Undergraduate Advisor)
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