LAUREN KOHLER

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EDUCATION

Masters of Nuclear Engineering   expected May 2025
North Carolina State University, Raleigh NC
Overall GPA: 4.0/4.0
Awarded University Nuclear Leadership Program Fellowship through Department of Energy.
Relevant Course Work

MA540: Uncertainty Quantification	NE795: Scientific Machine Learning
NE591: Advanced Reactor Concepts	NE505: Nuclear Reactor Systems

B.S. in Nuclear Engineering, Minor in Mathematics   May 2024
North Carolina State University, Raleigh NC
Overall GPA: 3.86/4.0
Maintained Dean's List during all enrolled semesters.
Relevant Course Work

NE400: Nuclear Reactor Energy Conversion	NE401: Nuclear Reactor Engineering
MA401: Partial Differential Equations	NE402: Nuclear Reactor Engineering

RESEARCH AND WORK EXPERIENCE

Nuclear Engineering Intern   June 2024 - August 2024
GE Hitachi - Advanced Design & Development   *Wilmington, NC*

Mentor: Dr. Jordan Rader (jordan.rader@ge.com)

- Perform improvements and characterize performance of multi-objective optimization for helical-coiled steam generator for future general applications to heat exchangers.
- Creating visualization toolkit for modeling various properties along sub-channels from computer program for coolant boiling in rod arrays, COBRA, output file.

Research Aide   January 2023 - present
Argonne National Laboratory   *Remote*

Mentor: Dr. Alexander Heifetz (aheifetz@anl.gov)

- Initiating patent process for 2 inventions: a computer program to validate temperature measurements for a distributed fiber optic sensor using a long short term memory autoencoder machine learning model and an algorithm to determine the calibration curve based on Bayesian inference.
- Developing a user interface to efficiently perform calibration of fiber optic cables in temperature sensing and validate measurements instantaneously.
- Investigated the affect of alternative temperature sensors in liquid sodium to advance development of sodium fast reactors, reducing operational and maintenance costs.

Undergraduate Research Experience in Nuclear Engineering   August 2021 - May 2024
North Carolina State University   *Raleigh, NC*

Mentor: Dr. Xu Wu (xwu27@ncsu.edu)

- Modeled a convolutional neural network model to simplify lithium isotope analysis by replacing mass spectrometer. Instead, the model is able to take lithium spectroscopy imaging results to predict at 99% of 0.01 nm where peaks occur within the emission spectra.

- Built a neural network model to predict crud induced power shifts in pressurized water reactors based on a limited data set using transfer learning. Use of this model saves over 20 hours from prior methods such as MAMBA while classifying at 90% accuracy based on pin powers and boron concentration.

Nuclear Engineering Intern   May 2022 - August 2022
GE Hitachi - Probabilistic Risk Analysis   *Wilmington, NC*

- Developed an autonomous analysis tool to compare the frequency and consequences of core damage sequences on the BWRX-300, a small modular reactor.

LEADERSHIP INVOLVEMENT

President and Secretary of Women in Nuclear   August 2023 - May 2025
Women in Nuclear - North Carolina State University Chapter   *Raleigh, NC*

- During the 2023 - 2024 academic year, served as the secretary of women in nuclear. Organized bi-weekly events for active chapter with the executive board to enhance the organization focus on women in nuclear science. Oversaw social media initiatives for community engagement on 4 platforms.
- Serving as president during the 2024 - 2025 academic year. Managing the NC State Chapter of WiN with over 50 active members by continuing to hold bi-weekly events and weekly executive board meetings.

Recording Secretary of Executive Board   January 2023 - December 2023
Alpha Omega Epsilon — Gamma Chapter   *Raleigh, NC*

- Managed attendance and voting records for all meetings and functions, ensuring a quorum was present for voting and accurately disseminating meeting minutes within set deadlines.
- Collaborated with volunteer chair to track and validate service hours for over 40 Active Members, while overseeing compliance with attendance policies and collecting semester-end committee reports.

PUBLICATIONS

Complete list of publications and references avaliable upon request.

1. A. Akins, A. Furlong, **L. Kohler**, J. Clifford, C. Brady, F. Alsafadi, X. Wu. "ARTISANS–Artificial Intelligence for Simulation of Advanced Nuclear Systems for Nuclear Fission Technology," Nuclear Engineering and Design, vol. 423, p. 113170, Jul. 2024.

2. **L. Kohler**, X. Wu, A. Heifetz, "Bayesian Inference and Inverse Uncertainty Quantification of Fiber Optic Distributed Temperature Sensing in a Thermal Mixing Tee" submitted for Proceedings of the ANS Best Estimate Plus Uncertainty International Conference (BEPU-2024). Lucca, Tuscany Italy, May 19 – 24, 2024.

3. **L. Kohler**, J. Clifford, E. Kautz, X. Wu. "ML-Spec: Benchmark Results of Machine Learning-Based Spectra Predictions of Time-Dependent Lithium Emission Spectroscopy Imaging." Submitted for Proceedings of ANS, Pennsylvania, USA, April 4 – 6, 2024.

4. **L. Kohler**, N. Etter, N. Ritchie, M. Diaconeasa. "Enhancing Probabilistic Risk Assessment for the PULSTAR Research Reactor with Advanced Fault Tree and Initiating Event Analysis Techniques." (In preparation to be submitted to Transactions of American Nuclear Society. University Park, Pennsylvania, USA, April 4 – 6, 2024).

5. **L. Kohler**, J. Clifford, E. Kautz, X. Wu. "ML-Spec: Machine Learning-Based Spectra Predictions of Time-Dependent Lithium Emission Spectroscopy Imaging," (In preparation to be submitted to Transactions of ANS. University Park, Pennsylvania, USA. April 4 – 6, 2024).

6. **L. Kohler**, M. Weathered, A. Heifetz, "Compression Multimodal Learning for Reconstruction of Temperature Field from Sparse Measurements in a Liquid Metal Cooled Reactor," (in preparation, to be submitted to Scientific Reports).

7. **L. Kohler**, A. Heifetz, M. Weathered, and A. Cilliers, "LSTM Autoencoder Prediction of Distributed Temperature in Liquid Sodium using Measurements with Co-located Fiber Optic Sensor and Sparse Multi-Point Thermocouple Array," in Transacations of American Nuclear Society. Washington, D.C., USA, November 12-15, 2023.

8. A. Furlong, F. Alsafadi, **L. Kohler**, X. Wu, S. Palmtag, A. Godfrey, and S. Hayes. "Machine Learning-Based Prediction of Crud Buildup Locations in Pressurized Water Reactors," in Transacations of American Nuclear Society. Washington, D.C., USA, November 12-15, 2023.

TECHNICAL SKILLS

- **Programming languages**: Python, MATLAB, R, LaTeX, Mathematica, Maple

- **Machine Learning libraries**: TensorFlow, Keras, scikit-learn, PyTorch