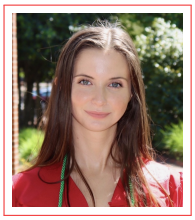

Alexandra Akins

Education

2019–2023 **Bachelor of Science - Nuclear Engineering**, *North Carolina State University*, Raleigh, NC, *3.708*

2019–2023 **Bachelor of Arts - International Studies**, *North Carolina State University*, Raleigh, NC, *3.708*
Concentration in sustainable development

2017–2019 **International Baccalureate Diploma**, *United World College of the Atlantic*, St. Donats, United Kingdom

Experience

Research and Vocational

2022–ongoing **Research Aide**, *Argonne National Laboratory*, Lemont, IL
Exploring utilization of artificial intelligence based anomaly detection in Advanced Reactor designs.
- Presented research at the American Nuclear Society 2022 Winter Meeting and 2023 Student Conference.

2020–2023 **Undergraduate Researcher**, *North Carolina State University*, Raleigh, NC
Investigated approaches to quantify the uncertainties introduced by applying Machine Learning models such as Artificial Neural Networks.
- Participated in Women and Minorities Summer Research Experience in Summer 2021.

2022 **Science Undergraduate Laboratory Internships (SULI)**, *Argonne National Laboratory*, Lemont, IL
Conducted research in applications of LSTM Autoencoders for use in anomaly detection within Sodium-cooled Fast Reactors.
- Selected to be one of four young researchers who met and spoke with the Secretary of Energy, Jennifer Granholm, representing the future of nuclear engineering research.
- Interviewed for the Argonne All-Hands meeting, alongside such figures as Paul Kerns, the director of Argonne.

Extracurricular and Leadership

2023 **NEA Global Forum Rising Stars Workshop**, *Presenter*

2020 – ongoing **American Nuclear Society** , *Member*

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2019–2023 **Student Coordinator**, *Office of Sustainability at North Carolina State University*, Raleigh, NC

Led a group of 30 students in efforts across campus to make the university and our peers more sustainable.

- Successfully achieved funding for two major projects within the stewards.
  - 32,000 dollars were raised for SolarSpace, a solar powered structure outside of Burlington Lab where students can charge their personal devices and collaborate in an outdoor space.
  - 26,000 dollars were raised for Campus Green Spaces, a project that was completed in May 2023, which entails a series of gardens where students can interact with pollinator friendly plants and aromatic herbs.
- Curated a campus-wide competition to encourage students to conserve energy and water that reached all students living in dorms, a total of over 8,900 students.

2023 – Ongoing **Raleigh City Farm**, *Volunteer*, Raleigh City Farm is a local non profit organization that provides pay-what-you-can fresh produce to low income communities through sustainable agriculture.

Skill matrix

	Level	Skill	Years	Comment
Coding Language:	■■■■□	Python	5	*Experienced with and have executed numerous Python based projects.*
	■■■□□	LaTeX	5	*Often use Latex and have submitted multiple papers with it.*
	■■□□□	MATLAB	1	*Have taken classes on MATLAB.*
Global Language:	■■■□□	Spanish	7	*Can speak and understand conversationally in Spanish.*
Computer:	■■□□□	Microsoft Word	11	*Have casually used Word for an extremely long time.*
	■■■□□	Microsoft Excel	9	*Capable of effectively utilizing Excel.*

Awards

2023 **National Science Foundation** , *Graduate Research Fellowship Program*

2023 **North Carolina State University** , *Sustainability Award Student Recipient*

2023 **North Carolina State University Department of Nuclear Engineering**, *Best Senior Design Presentation*

2023 **American Nuclear Society Student Conference**, *Best Undergraduate Paper*

2021, 2022 **Department of Energy**, *Nuclear University Leadership Program (UNLP) Scholarship*

2020 **Nuclear Regulatory Commission** , *Nuclear Education Program Scholarship*

2020, 2021, 2022 **North Carolina State University** , *D. Rex Smith/Benjamin Franklin Dual Degree Scholarship*

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Publications

1. Akins, A., Polke, A., DelaCruz, S. Hoyt, N. Heifetz, A. (2024) Machine Learning-Assisted Chemometrics for Concentration Detection from Linear Sweep Voltammetry Measurements.In Transactions of American Nuclear Society. Orlando, FL, USA, Nov 17-20, 2024.
2. Akins, A., Kultgen, D., and Heifetz, A. (2023). Anomaly Detection in Liquid Sodium Cold Trap Operation with Multisensory Data Fusion Using Long Short-Term Memory Autoencoder. Energies, 16(13), 4965.
3. Akins, A., Kultgen, D., and Heifetz, A. (2023). Anomaly Detection in a Cold Trap Liquid Sodium Purification System through Multisensory Data Fusion with Deep Learning Autoencoders. ANS Student Conference, Knoxville, TN, USA, Apr. 13-15, 2023.
4. Akins, A., Griffin, T., Osborne, H., Trucks, C., Palmer, J., Yang, G., Design and Testing of Low Pressure Heated Subcapsule for Use in Irradiation Experiments. Knoxville, TN, USA, Apr. 13-15, 2023.
5. Akins, A., Kultgen, D., and Heifetz, A. (2022). Utilizing Long Short Term Memory Networks in an Autoencoder for Anomaly Detection for Thermal Mixing in a Water Loop. In Transactions of American Nuclear Society. Phoenix, AZ, USA, Nov. 13-17, 2022.
6. Akins, A. and Wu, X. (2022). Using Physics-Informed Neural Networks to solve a System of Coupled ODEs for a Reactivity Insertion Accident. In Proceedings of the International Conference on Physics of Reactors 2022. Pittsburgh, PA, USA, May 15–20, 2022.
7. Akins, A., Xie, Z., and Wu, X. (2021). Solving a System of Ordinary Differential Equations for Reactivity Insertion Accident with Artificial Neural Networks. In Transactions of American Nuclear Society. Washington, DC, USA, Nov. 30 - Dec. 4, 2021.

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