

KAELEY STEVENS

Education

Pursuing PhD in *Nuclear Engineering*

Oregon State University

- 4.00 GPA
- Expected to complete PhD degree by Spring 2024
- Conducting PhD research under Dr. Izabela Gutowska and partnered with Idaho National Laboratory through a Graduate Fellowship
- Awarded Schuette Fellowship for 2021-2022 academic year

Master of Science in *Nuclear Engineering*, Conferred December 2021

Oregon State University

- 4.00 GPA
- Conducted Master's research under Dr. Izabela Gutowska and partnered with NuScale Power through a graduate internship
- Graduate teaching assistant (GTA) for the School of Nuclear Science and Engineering, 2019-2020 and 2020-2021 academic years

Bachelor of Science in *Mechanical Engineering*, Conferred June 2019

California Polytechnic State University

Work Experience

Idaho National Laboratory

Graduate Fellow – August 2022 to present


- Working on a team to develop a system framework for remote operation of nuclear microreactors
- Developing a physics-based model and data-based model of a heat pipe-based test facility for proof of concept for the remote operation framework
- Using the application Sockeye which is based within INL's Multiphysics Object Oriented Simulation Environment (MOOSE) for the physics-based modeling and Python for the data-based modeling

NuScale Power

Graduate Intern with the Office of Technology – February 2020 to August 2022

- Created 3D models of microreactor concepts using SolidWorks
- Used Ansys-CFX to perform detailed CFD analysis of the natural circulation flow throughout a microreactor design concept
- Used Matlab to model radiation heat transfer scenario to support concept development
- Performed many different calculations to assist with development of projects
- Patent Pending – Application number 17/404,607 (Inventor Status)
 - Thermal Power Conversion Systems Including Heat Pipes and Photovoltaic Cells

 Harrisburg, OR

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Skills

- Mechanical Design
- Technical Writing
- Problem Solving

Microsoft Applications

- Word
- Excel
- PowerPoint

Engineering Software

- SolidWorks
- MATLAB
- Ansys-CFX
- Python

Relevant Coursework

- Nuclear Reactor Thermal Hydraulics
- Engineering Applications of Computational Fluid Dynamics
- Applied Heat Transfer
- Optimization in Design
- Thermal Systems Design
- Mechanical Systems Design
- Nuclear Energy Power Generation

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Completed Projects

Master's Thesis – Steady-State Computational Fluid Dynamics Analysis of a Quarter-core Liquid Metal-hydride Cooled Microreactor

Assessed the natural circulation and heat transfer throughout the primary reactor vessel of a liquid metal-hydride cooled microreactor design. Additionally, worked on optimizing the design to meet specific figures of merit. Communicated results through data analysis and illustrative post-processing. Several design iterations were tested and a procedure was developed for baseline studies for future optimization.

Cal Poly Senior Project – Insulated Solar Electric Cooker (ISEC)

The goal of the project was to provide a cheap, pollution-free way for people in underdeveloped countries to cook their meals. The focus of my team was to develop a manufacturing process and a prototype of an immersion heater that will provide sufficient heat for cooking with the power from one 100W solar panel.

Publications

2023 NPIC&HMIT Conference:

K. Stevens *et al.*, "Opportunities and Challenges for Remote Microreactor Operations," in *13th Nuclear Plant Instrumentation, Control & Human-Machine Interface Technologies*, Knoxville, TN, 2023: ANS, pp. 768-776, doi: 10.13182/NPICHMIT23-41022.

Expansion of NPIC&HMIT Conference paper for journal submission:

K. Stevens *et al.*, "Opportunities, Challenges, and Research Needs for Remote Microreactor Operations," submitted 2023, under review

2023 AHFE International Conference:

K. Stevens *et al.*, "Digital Twin Framework for the Resilient Remote Monitoring and Operation of Nuclear Microreactors," in *AHFE International: Emerging Technologies and Future of Work*, Honolulu, HI, 2023, vol. 117: AHFE, pp. 10-20, doi: 10.54941/ahfe1004400.