Ryan Afzal

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I am a dedicated, highly motivated PhD student at UC Berkeley. I specialize in thermal-hydraulics and have broad experience with software design and with designing, building, and testing mechanical and electronic systems.

Education

May 2031 ***Ph.D. in Nuclear Engineering***
University of California Berkeley | Berkeley, CA

May 2025 **Bachelor of Science in Engineering Physics**
Tufts University | Medford, MA

- **Honors:** Summa Cum Laude with High Honors in Thesis
- **Senior Thesis:** "*Numerical Simulation of Turbulent Asymmetric Flow in a Passive Containment Cooling System Thermosiphon*"

Work Experience

Aug 2025 – Present **Graduate Researcher, HEAT Lab**
University of California Berkeley | Berkeley, CA

Working under Prof. Guanyu Su to develop a novel, high-throughput method of characterizing the thermal properties of engineered materials.

May 2024 – Aug 2024 **Student Intern**
United States Nuclear Regulatory Commission | Rockville, MD

Ran computational fluid studies using ANSYS FLUENT related to passive cooling systems for nuclear reactors. Worked under a senior-level advisor, as part of a team of engineers, assisting an international project in planning an experiment. Ran sensitivity studies and analyzed data. Also examined a report for a licensee's design application for discrepancies and compiled data for knowledge management internal to the agency.

Mar 2023 – Aug 2023 **Student Intern**
Lockheed Martin | Bothell, WA

Small-project member of a team of engineers building a low-cost counter-UAS laser weapon system. Worked with camera, gimbal, and control system; wrote software, designed mechanical hardware, and integrated software, control systems, and hardware together.

Volunteering

Nov 2022 – Mar 2023 **Event Coordinator**
Tufts Energy Conference | Medford, MA

Volunteered as an event coordinator for the 2023 annual Tufts Energy Conference. I planned the panel *Scaling Next Generation Energy Solutions: The Nuclear Approach* on nuclear energy's role in future electrical grids.

July 2019 – Aug 2019 **Research Intern**
University of Washington | Seattle, WA

Skills

Computational

- Highly proficient in C#, Python, Java; familiar with C++, XML, MATLAB
- Proficient in modeling and analysis codes including:
  - **CFD:** COMSOL, FLUENT, STAR-CCM+
  - **Solid Mechanics:** Fusion 360, SOLIDWORKS, Creo Parametric

Research

Graduate Researcher, HEAT Lab - *PINN-enhanced lock-in thermography for multi-dimensional thermal characterization of anisotropic materials*. Working under Prof. Guanyu Su to develop neural network-enhanced measurement techniques for engineered materials.

Personal Projects

(My full portfolio is available at ryanafzal.com)

Sep 2023 – May 2024 **Multiple Rocket Launcher**

Designed, built, and tested a robotic multiple rocket launcher that could rotate and elevate a large (100lb) model rocket automatically for launch. For safety reasons, it required ample weight capacity and precise design. I wrote microcontroller firmware and developed a simulator for the control loops to verify behavior, as well as doing the full mechanical design, fabrication, and testing.

Professional Activities

ANS Student Conference 2025, Technical Presentation 2025
American Nuclear Society (ANS) Student Member 2024 – Present

Honors & Awards

John G. Maurer Fellowship June 2025
Howard Sample Prize Scholarship in Physics April 2023
Sigma Pi Sigma Physics Honor Society April 2023 – Present

Publications

Afzal, Ryan. "Numerical Simulation of Turbulent Asymmetric Flow in a Passive Containment Cooling System Thermosiphon." Senior Honors Thesis, Tufts University. 2025.
https://hdl.handle.net/10427/VQ280346V