Adam Dix
Prospective PhD Student
School of Nuclear Engineering
Purdue University

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Education

B.S. Nuclear Engineering, Purdue University, West Lafayette, IN May 2020

Research Interests

Nuclear Reactor Thermal-hydraulics, Reactor Safety, Liquid Metal Thermal-hydraulics, Advanced Reactor Design, Two-phase Flow Hydrodynamic, Experimental Thermal-hydraulics, Computational Thermal-hydraulic simulations

Research Projects

Experimental Study and CFD Design Tool Development for the Cartridge Loop in the Versatile Test Reactor, Thermal-hydraulics and Reactor Safety Laboratory, Purdue University | 2020-present

- Assisting with performing CFD analysis of sodium cartridge loop of the Versatile Test Reactor
- Validating CFD results in ANSYS FLUENT against existing experimental data for 7-pin hexagonal channel geometries

Purdue Inclined Two-phase Adiabatic Test Facility, Thermal-hydraulics and Reactor Safety Laboratory, Purdue University | 2018-present

- Investigating the basic hydrodynamics of two-phase flow, especially the effects of various body forces on bubble behavior.
- Cooperating with research team, designed and constructed the PITA (Purdue Inclined Two-phase Adiabatic) test facility.
- Utilized advanced instrumentation, including local conductivity probes, an impedance meter, and pressure transducers to measure two-phase parameters such as void fraction, bubble velocity, interfacial area concentration, etc.

Mechanistic Source Term Analysis Toolkit, Nuclear Science and Engineering Division, Argonne National Laboratory | 2019

- Tasked with the development of a graphical user interface for mechanistic source term analysis of liquid metal cooled reactors.
- Integrated safety and systems analysis codes such as SAS4A/SASSYS-1 and SRT to trace accident situations from fuel failure to radionuclide release and potential dose to the public.
- Produced documentation for graphical user interface for eventual use by industry or others for licensing efforts.

SAS4A/SASSYS-1 Software Quality Assurance Support, Nuclear Science and Engineering Division, Argonne National Laboratory | 2018

- Performed several tasks based around Software Quality Assurance (SQA) for the fast reactor safety analysis code SAS4A/SASSYS-1.
- Developed a Python script to process code coverage statistics from the Intel Fortran compiler.
- Upon completion of initial Python script project, reviewed analytical solutions to unit test cases, developed training information for unique code modules, and started the development of a continuous integration tool for automated compiling and testing of new changes.

Magnetohydrodynamic Generator Design, Nuclear Energy Operations and Nonproliferation Lab, Purdue University | 2017-2018

- On a team analyzing the possibility of using a magnetohydrodynamic (MHD) generator system to design a liquid metal cooled reactor with no moving parts.
- Work won the Exelon Innovation Competition at the ANS Student Conference in 2017.
- Gained valuable experience by attempting to model an MHD generator in ANSYS FLUENT.

Professional Experience

Undergraduate Student Grader, Purdue University | 2019-present

- Graded coursework for NUCL 200: Introduction to Nuclear Engineering and NUCL 350: Introduction to Fluid Mechanics.
- Assisted students by holding office hours, answering homework questions, and proctoring exams.

Student Associate, Pappy's Sweet Shop, Purdue University |2017

- Performed cook and cashier duties alongside other students for one of Purdue's most popular eateries.

Professional Memberships

American Nuclear Society, 2016-present

Women in Nuclear, 2019-present

Awards

- NRC Scholarship, Purdue University (2017)
- Presidential Scholarship, Purdue University (2016)
- CNHi Scholarship (2016)
- Boy Scouts of America Eagle Scout (2016)

Volunteering

American Nuclear Society Purdue University Student Section | 2016-present

- Current president of the Purdue University Student Section, formerly held positions of vice-president, secretary, and sophomore class representative.
- Planned events for an organization of up to 50 members, including the Atoms for Humanity Summit at Purdue University, a career fair, research fair ANS Student Conference trips, and various social events.
- Planned and volunteered at on-campus "Nuke Week" booth to spread a positive message about nuclear power to the public, as well as assisting with nuclear reactor tours.

Purdue University School of Nuclear Engineering Student Ambassador | 2018-present

- Represented the School of Nuclear Engineering by interfacing with prospective students, parents, and high-level guests of the school.
- Entrusted with being the face of the department for guests such as an NRC commissioner, ABET accreditor, and Department of Energy officials.

Boy Scout Troop 510 | 2009-2016

- Volunteered at community organizations, painting fences, serving food, removing invasive species, etc. Well over 100 hours served.

Publications

Ryan, D., Loescher, C., Hamilton, I., Bean, R., & Dix, A. (2018). Magnetic variation and power density of gravity driven liquid metal magnetohydrodynamic generators. *Annals of Nuclear Energy*, *114*, 325-328.