Ian Q. Snider

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EDUCATION

Washington University in St. Louis, *St. Louis, MO* — *Expected: May 2025*
B.S. Mechanical Engineering — GPA: 4.00/4.00

Truman State University, *Kirksville, MO* — *Conferred: Dec 2024*
B.A. Physics, Mathematics minor — GPA: 3.89/4.00

- Enrolled in: Physics/Engineering Dual-Degree Program with Washington University in St. Louis

EXPERIENCE

Brookhaven National Laboratory - *Nuclear Science Intern*, *Upton, NY* — *2022 - present*
Faculty mentor: Gustavo Nobre - *National Nuclear Data Center, Brookhaven National Laboratory*

Investigating the Impact of Thermal-Neutron Cross Sections in Reactor Applications

- Applied perturbation schemes to the thermal $1/v$ region of neutron interaction cross sections. Designed a sensitivity analysis for testing thermal cross sections in nuclear data relevant to reactors. Modeled neutron transport using Monte Carlo simulation software. Tested gadolinium isotope perturbations on plutonium nitrate PU-SOL-THERM-034 critical benchmarks with OpenMC

Resonance Capture Widths for the Bayesian Resonance Reclassifier

- Developed Python machine learning methods for training an algorithm to reclassify Pb-206 cross section resonances. Employed random matrix theory to describe statistical properties of slow-neutron resonances in heavy nuclei. Sampled capture widths from a Porter-Thomas distribution to create more realistic synthetic training data for the Bayesian Resonance Reclassifier

Accuracy Correlation in Neutron Resonance Reclassification

- Applied machine learning to train an algorithm for correcting the resonance region of experimental cross section evaluations. Used random matrix theory and statistical properties of resonances to develop a machine learning feature set for classifying neutron resonances in heavy nuclei. Developed an iterative learning method for incrementally improving the success of a trained algorithm

Truman State University - *Student Researcher* — *2021 - 2022*
Faculty mentor: Vayujeet Gokhale - *Dept. of Physics, Truman State University*

Interface for Starlink Satellite Observations

- Calculated trajectories of Starlink satellites to optimize telescope viewing plans. Researched long-exposure luminosity data corruption due to Starlink satellite interference. Developed a GUI for Truman astronomy students. Wrote and submitted a proposal for the TruScholars grant

SKILLS

- Coding Languages/Software: Python, C, C++, Shell, LaTeX, Octave, Mathematica, MATLAB, SolidWorks, Linux, Computer clusters, Git, OpenMC, NJOY2016, Microsoft Office, Vim, Arduino
- Technical/Laboratory: Technical writing, machining, basic analog & digital electronics, robotics
- Advanced physics coursework/lab experience in Electricity & Magnetism, Electronics, Classical Mechanics, Quantum Physics, Mathematical Physics, Vibrations, Thermodynamics, Fluid Mechanics, Solid Mechanics, Heat Transfer, Acoustics, and Materials Science
- Advanced mathematics coursework in Linear Algebra, Ordinary Differential Equations, Computing Structures, Control Systems, and Optimizations

ACTIVITIES

MARINER Robotics Project - *Project Lead* — *September 2024 - present*

- Collaborated with other students to develop an advanced autonomous underwater vehicle (AUV)
- Researched and developed hydrodynamic dive control
- Built a chassis and buoyancy engine
- Researched translational acoustic-RF communications (TARF) for data transmission at the water-to-air interface

WashU Climbing - *Member* *January 2024 - present*
- Indoor & outdoor bouldering, top roping, and lead climbing

MATE ROV Competition - *Mechanical Team Lead* *August 2023 - present*
- Mechanical sub-team lead on the MATE ROV underwater robotics team
- Designed and built a vertical profiling buoyancy engine
- Designed grabbers and manipulators for the main ROV chassis

Society of Physics Students - *Demo Chair* *2020 - 2023*
- Organize, develop, and perform physics demos
- Inform/encourage students to engage in research activities
- Weekly commitment to volunteer physics tutoring
- Wrote and proctored exams for 2022 & 2023 Science Olympiads ("Crave the Wave" and "Remote Sensing")

Dark Sky TSU *Fall 2021 - Spring 2022*
- Group at Truman State University dedicated to light pollution education and outreach

Competitive Math *December 2022*
- Participated in the 2022 Putnam competition

SELECTED HONORS

Conference Experience for Undergraduates 2023 *September 2023*
- Competitive research abstract award
- Invitation to present a research poster at the APS DNP Fall 2023 conference on The Big Island, HI

Conference Experience for Undergraduates 2022 *August 2022*
- Competitive research abstract award
- Invitation to the poster presentation at the APS DNP Fall 2022 meeting in New Orleans, LA

Sigma Pi Sigma Honor Society *May 2022*
- Recognized for service and academic scholarship in physics

PUBLICATIONS

- G. Nobre, I. Snider, E. Sun, D. Brown, A. Cuadra, W. Haeck, and C. Lu, "Annual Report on NCSP Technical Support task in BNL during FY24," Technical Report BNL-226264-2024-INRE (2024).
- I. Snider, G. Nobre, and D. Brown, "Resonance capture widths for the bayesian resonance reclassifier," in APS Meeting Abstracts (2023) pp. DB03–074.
- I. Snider, G. Nobre, D. Brown, and W. Fritsch, "Accuracy correlation in neutron resonance reclassification," in APS Meeting Abstracts (2022) pp. HA-023.

CONFERENCE PRESENTATIONS

- Brookhaven National Laboratory Student Research Conference. Brookhaven National Lab Bldg. 488, Upton, NY, August 9th, 2024.
- American Physical Society - Division of Nuclear Physics and Japan Physical Society joint fall meeting. Hilton Waikoloa Village, The Big Island, HI, Nov 27-Dec 1, 2023.
- Brookhaven National Laboratory Student Research Conference. Brookhaven National Lab Bldg. 488, Upton, NY, August 10th, 2023.
- Truman State University Student Research Conference. Truman State University, Kirksville, MO, April 21st, 2023.
- American Physical Society - Division of Nuclear Physics fall meeting. Hyatt Regency Hotel, New Orleans, LA, October 29-31, 2022.
- Brookhaven National Laboratory Student Research Conference. Brookhaven National Lab Bldg. 488, Upton, NY, August 11th, 2022.