IAN SNIDER

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EDUCATION

Ph.D. Nuclear Engineering - University of California, Berkeley — *Aug 2025 - present*
B.S. Mechanical Engineering - Washington University in St. Louis — 4.00/4.00 — *May 2025*
B.A. Physics, Math minor - Truman State University — 3.89/4.00 — *Dec 2024*

PROJECTS

Sniff Consensus Protocol for Noisy Multi-Agent Formations - ***Developer*** *Fall 2025*
- Consensus protocol for a random graph of agents perturbed with communication noise
- Used Erdos-Renyi graphs to generate adjacency matrices and applied communication noise with Random Matrix Theory
- Used ROS2, Python, and Rust, for design, simulations, and stability analysis

WashU Robotics MateROV & MARINER Projects - ***Mechanical Lead*** *2023 - 2025*
- Designed and tested an autonomous underwater vehicle (AUV)
- Prototyped dive control using an IMU and depth state estimation with a Kalman Filter for 1D hovering
- Used Arduino for programming AUV sensors and control system
- Built a chassis and buoyancy engine

CrazyFlie 2.1 cascaded PID/PD Control System - ***ESE 4481 Student*** *Spring 2025*
- Designed a control system for a CrazyFlie 2.1 quadcopter and achieved stable hovering
- Used Simulink and MATLAB for simulating the control system response and finding stability margins
- Used C to program the quadcopter embedded system

EXPERIENCE

Lawrence Berkeley National Laboratory - *Lab Affiliate*, *Berkeley, CA* *Aug 2025 - present*
- Developed a Monte Carlo simulation to optimize sensor timing cycles for event coincidence detection
- Studied primary gamma extraction from the Oslo Matrix

Lawrence Livermore National Laboratory - *Graduate Intern*, *Livermore, CA* *June 2025 - present*
- Developed CRISP (Compute & Resource Intensive Simulation Pipeline), a Python tool for parallelizing and distributing high-performance computing (HPC) jobs
- Test driven Python development included Poetry, CI/CD, SQLite, MPI, CLI, feature branching, and Sphinx
- Used 2 world-class LLNL HPC clusters Dane and Ruby with Slurm sbatch/srun scripts
- CRISP successfully automated compilation and benchmarking workflows for ~3420 reactor simulation cases
- Maintainer of the CRISP project

Brookhaven National Laboratory - *Student Researcher*, *Upton, NY* *Summers 2022 - 2024*
- Developed BRR (Bayesian Resonance Reclassifier) for resonance reclassification on HPC clusters
- Applied machine learning using Scikit-learn to classify resonance spin-group assignments for capture cross-sections
- Used Random Matrix Theory and nuclear data for finding and scaling eigenvalues from reaction Hamiltonians to build synthetic training sets
- Used the transport code OpenMC and HPC clusters to parallel process perturbative sensitivity analyses for reactor models

Truman State University - *Student Astronomy Researcher*, *Kirksville, MO* *2021 - 2022*
- Calculated trajectories for ~3000 Starlink satellites to optimize telescope viewing plans and developed a GUI

SKILLS

- **Programming:** C, C++, Python, Go, Bash, Lua, MATLAB, Mathematica, Octave, LaTeX, Typst, Vimscript
- **Software/Technical:** Simulink, SolidWorks, OpenMC, COG, MCNP, Pytorch, Scikit-learn, Slurm, Git, Linux, Arduino

- **Physics/engineering:** Autonomous Aerial Vehicle Control, Classical Mechanics, Electrodynamics, Electronics, Vibrations, Quantum Mechanics, Mathematical Physics, Nuclear Physics, Fluid Mechanics, Solid Mechanics, Acoustics, Materials Science, Thermal Systems, Criticality Safety, Radiation Biology, Turbojets, Ramjets
- **Math:** Linear Algebra, ODEs, Computing Structures, Control Systems, Machine Learning, Random Walks, Random Matrix Theory, Orthogonal Groups, and Optimizations

ACTIVITIES

WashU Robotics - ***Mechanical Lead*** *2020 - 2023*
- Mechanical lead on the MateROV underwater robotics team (*see projects*)

WashU Climbing - ***Member*** *2023 - 2025*
- Indoor and outdoor bouldering and lead climbing

Society of Physics Students - ***Demo Chair*** *2020 - 2023*
- Developed 3 new physics demos, performed demos at meetings, and provided volunteer physics tutoring
- Wrote and proctored exams for 2022 & 2023 Science Olympiads ("Crave the Wave" and "Remote Sensing")

TECHNICAL REPORTS AND ABSTRACTS

[1] G. Nobre *et al.*, "Annual Report on NCSP Technical Support task in BNL during FY24," 2024. doi: 10.2172/2474826.

[2] I. Snider, G. Nobre, and D. Brown, "Resonance Capture Widths for the Bayesian Resonance Reclassifier," in *APS Meeting Abstracts*, in APS Meeting Abstracts. Jan. 2023, p. DB3.074. [Online]. Available: https://ui.adsabs.harvard.edu/abs/2023APS..HAWD03074S

[3] I. Snider, G. Nobre, D. Brown, and W. Fritsch, "Accuracy Correlation in Neutron Resonance Reclassification," *Bulletin of the American Physical Society*, vol. 67, 2022.

CONFERENCE PRESENTATIONS

- Lawrence Livermore National Laboratory Student Research Conference. Lawrence Livermore National Lab B511, Livermore, CA, August 7th, 2025.
- 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.

HONORS

Kenneth L. Jerina Prize for Outstanding Dual-Degree in Mechanical Engineering - WashU Engineering *April 2025*
- Honored for academic achievements and engineering community contributions

Conference Experience for Undergraduates 2023 - APS DNP *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 - APS DNP *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 - Truman State University *May 2022*
- Recognized for service and academic scholarship in physics