

IAN SNIDER

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Robotist designing autonomous aerial vehicles for radiation detection.

EDUCATION

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

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*

- Studied slung-payload algorithms for a radiation detector tethered to an autonomous hexacopter

Lawrence Livermore National Laboratory - *Graduate Intern*, Livermore, CA *June 2025 - present*

- Developed CRISP (CRITICAL 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

Brookhaven National Laboratory - *Student Researcher*, Upton, NY *Summers 2022 - 2024*

- Developed BRR (Bayesian Resonance Reclassifier) for reclassification tasks on HPC clusters
- Applied machine learning using Scikit-learn to classify nuclear data
- Used Random Matrix Theory for finding and scaling eigenvalues to build synthetic training sets
- Used the transport code OpenMC and HPC clusters to parallel process 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, Radiobiology, 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](https://doi.org/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