William Miyahira

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Summary

Ph.D. candidate in Physics specializing in ultracold atomic systems, atom chips, and RF/microwave quantum control. Experienced in experimental design, laser and microwave systems, and quantum sensing platforms.

Education

2021 – present **Ph.D., William & Mary**
Advisor: Seth Aubin *Research: Ultracold Atomic Physics*

2019 – 2021 **M.S. Physics, William & Mary**

2015 – 2019 **B.S. Physics and Mathematics, University of Puget Sound**

Skills

Research	Experimental planning, hardware control, data analysis and visualization, scientific writing, ability to work independently and cooperatively as part of a team
Instrumentation	Oscilloscopes, spectrum analyzers, vector network analyzers, electronics (analog, digital, RF), optics (lasers, optomechanics, laser locking), RF sources, Arduino, 3D printing, Dektak Surface Profiler
Management	Mentored and trained undergraduates (>15) and new graduate students (2) in optics, electronics, simulation, instrumentation, and experimental techniques
Programming	Python, Matlab, LaTeX, C++, HTML
Software	FEKO, HFSS, SONNET, Fusion 360, Inkscape
Languages	English (native), French (elementary)

Employment History

2020 – · · · · **Graduate Research Assistant,** Physics Department, William & Mary.

- Managed and improved apparatus for routinely producing ^{87}Rb Bose-Einstein Condensates (BECs) on a micro-magnetic atom chip trap
- Conducted the first experimental measurements of atom chip potential roughness suppression in a radio-frequency AC Zeeman trap
- Modeled magnetic fields of atom chip wire configurations and magnetic coils using Python and Matlab
- Led the design, construction, and testing of a custom multi-channel microwave source at 6.8 GHz based on IQ modulation with precision digital phase control and agile frequency sweeping (100 MHz scan range)
- Engineered a broadband (DC—20 GHz) interface for efficient coupling of SMA connectors to narrow atom chip traces, including simulation and prototyping
- Python simulation of atom trajectories in an AC Zeeman chip trap potential

2018 **Sherman Fairchild Research Scholar,** Physics Department, University of Puget Sound.

- Investigated polarizing Majorana fermions via their anapole moment.

2017 **Adam S. Goodman Research Scholar,** Physics Department, University of Puget Sound.

- Studied effects of commercial dampeners on the modal decay rates of a drum.

Grants and Awards

2024	FIO+LS Poster Competition Winner – Optical Cooling and Trapping Technical Group
2022-24	"Microwave Atom Chip for Spin-Specific Atom Interferometry", Virginia Space Grant Consortium Graduate Fellowship – $6,000/year ($12,000 total)
2018	Top Undergraduate Research Poster – 2018 APS Northwest Division Conference
	University of Puget Sound Concerto Aria Competition Winner
2015	Eagle Scout – Boy Scouts of America (Troop 44, San Mateo, CA)

Professional Service

2024-2025	William & Mary Physics Graduate Student Association President
2021-2025	Optica (formally OSA) Student Chapter Vice President

Select Publications

Journal Articles

1. **W. Miyahira**, A. P. Rotunno, T. Tingle, and S. Aubin, "Experimental demonstration of potential roughness suppression in a radio-frequency ac zeeman chip trap," In preparation.
2. **W. Miyahira**, T. Tingle, and S. Aubin, "Tapered microstrip wedge for broadband atom chip experiments," In preparation.
3. A. P. Rotunno, **W. Miyahira**, S. Du, and S. Aubin, "High frequency ac zeeman trap on an atom chip," In preparation.
4. A. Rotunno, **W. Miyahira**, S. Du, and S. Aubin, "Radio-frequency ac zeeman force for ultracold atoms," *Physical Review A*, vol. 110, no. 6, p. 063 321, 2024.
5. S. Du, A. Ziltz, **W. Miyahira**, and S. Aubin, "Suppression of potential roughness in atom-chip ac zeeman traps," *Physical Review A*, vol. 105, no. 5, p. 053 127, 2022.
6. **W. Miyahira**, A. P. Rotunno, S. Du, and S. Aubin, "Microwave atom chip design," *Atoms*, vol. 9, no. 3, p. 54, 2021.
7. **W. Miyahira** and D. C. Latimer, "Dipoles in quantum field theory," *American Journal of Physics*, vol. 87, no. 2, pp. 146–152, 2019.

Conference Proceedings

1. **W. Miyahira** and S. Aubin, "Potential roughness suppression in a rf ac zeeman atom chip trap," in *Quantum Sensing, Imaging, and Precision Metrology II*, SPIE, vol. 12912, 2024, pp. 247–251.
2. R. Worland and **W. Miyahira**, "Physics of musical drum head damping using externally applied products," in *Proceedings of Meetings on Acoustics*, AIP Publishing, vol. 35, 2018.

Hobbies

Rock climbing, drumming, mountaineering