

Glenn Ochsner

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Career Objective

- Ph.D. in Quantum Information/Computing. Conduct research at a university or national laboratory on quantum hardware implementation.

Education

Physics, B.S.; Mathematics, B.S. | Expected Graduation May 2026 | Miami University

- Minor: Electrical Engineering
- GPA: 4.00/4.00

Research Experience

Department of Physics, University of Miami, Miami, FL

Summer 2025

Olga Korotkova, PhD, REU Advisor

- 10 week summer research program for undergraduate students where I worked in a theoretical optics lab studying the structure of the Polarization-Orbitalization Tensor at two radii.
- Performed calculations to derive quantities revealing the structure of the tensor and simulated them on MATLAB using Laguerre-Gaussian beams of trivial radial order and varying orbital angular momentum modes.

Department of Physics, Miami University, Oxford, OH

Jan 2023 - Present

Macklin Quantum Information Science Group

Imran Mirza, PhD, Research Advisor

- Modelled quantum optical systems including optomechanical rotating ring resonators coupled with two and three level atoms to see the effect of rotation on the overall transmission of light through the system. Subsequent projects will involve a 2D lattice of resonators to create a quantum simulator.
- 4-5 hours per week during the semester (does not include summers) where I developed Hamiltonians for each system, wrote the Heisenberg equations of motion, expanded using a steady-state approximation, calculated the transmission through the system, plotted results, and presented to various audiences.
- Gained experience writing papers, posters, and presentations using LaTeX, basic knowledge of plotting results using Mathematica, practice presenting and answering questions on a technical poster, and various analytic techniques useful in quantum information science.

Oak Ridge Institute for Science and Education, Albuquerque, NM (Virtual)

July 2021

Joint Science and Technology

Megan Ivory, PhD, Primary Instructor

- Two week virtual high school summer research experience with 25-30 hours per week. Learned theory, conducted a guided experiment, and presented results through a poster and video presentation.
- Used IBMQ's cloud quantum computing software to experimentally create Bell states and Greenberger-Horne-Zeilinger states on quantum computers vs simulations and compare the outcomes.

Publications

- Glenn Ochsner, Sushil Pokharel, Jyrki Laatikainen, Olga Korotkova (2025, October). Orbitalization properties of optical beams [Expected Conference Paper] FiOLS, Denver, CO
- Glenn Ochsner, Arushi Deb, Vinny Schena, Nishan Amgain, Imran Mirza (2025, October). Single-photon scattering in waveguide QED: two small atoms vs. a single giant atom problem [Expected Conference Paper] FiOLS, Denver, CO
- Glenn Ochsner, Jyrki Laatikainen, Olga Korotkova (Accepted 2026, January). Radial similarity measures for vectorial structured light, Optics Letters
- Glenn Ochsner, Jaela Allen, Imran Mirza (2024, September). Non-reciprocal Light Propagation in Spinning Ring Resonators Coupled with Two-level Atoms. [Conference Paper] FiOLS, Denver, CO.

Presentations

- Glenn Ochsner*, Sushil Pokharel, Jyrki Laatikainen, Olga Korotkova (2025, October). Orbitalization properties of optical beams [Contributed Talk] FiOLS, Denver, CO
- Glenn Ochsner*, Arushi Deb, Vinny Schena, Nishan Amgain, Imran Mirza (2025, October). Single-photon scattering in waveguide QED: two small atoms vs. a single giant atom problem [Poster Presentation] FiOLS, Denver, CO
Poster also presented at MCAW 2025 in Urbana, IL
- Vinny Schena*, Arushi Deb*, Glenn Ochsner, Imran Mirza (2025, October) Breaking the dipole approximation: single-photon quantum optics with giant atoms [Poster Presentation] FiOLS, Denver, CO
- Glenn Ochsner*, Jyrki Laatikainen, Olga Korotkova (2025, July) Radial Similarity of the Polarization-Orbitalization Tensor [3MT & Poster Presentation] University of Miami Undergraduate Research Symposium, Coral Gables, Florida
- Glenn Ochsner*, Imran Mirza (2025, April). An Investigation of the Integer Quantum Hall Effect [Poster Presentation] Miami University URF (and Ohio Academy of Science Annual Meeting), Oxford, OH
- Glenn Ochsner*, Jaela Allen*, Imran Mirza (2024, September). Non-reciprocal Light Propagation in Spinning Ring Resonators Coupled with Two-level Atoms. [Poster Presentation] FiOLS, Denver, CO.
- Jaela Allen*, Glenn Ochsner* (2024, April). Optomechanically induced transparency in a spinning resonator. [10-minute talk] Miami University URF, Oxford, OH.
- Glenn Ochsner* (2023, April). Sending Secure Information Using Quantum Technology. [Poster Presentation] Miami University URF, Oxford, OH.
- Ethan Barry, Cameron Dickens, Janice Enwefa, Emily Escalera, Ethan Hall, Katie Jones, Glenn Ochsner, Sourish Pasula, Galilea Rodriguez, Charles Wang (2021, July). Entangling Qubits on IBM Quantum Computers. [Poster Presentation] JSTI Virtual 2021.

*Denotes presenting author(s)

Relevant Coursework

Physics: General Physics 1&2; Contemporary Physics 1&2; Contemporary Physics Lab; Introduction to Computational Physics; Thermodynamics & Introduction to Statistical Physics; Mathematical Methods in Physics; Electromagnetic Theory; Introduction to Quantum Mechanics I; Modern Quantum Mechanics I*; Classical Mechanics*

Mathematics: Calculus I-III; Linear Algebra; Differential Equations; Introduction to Proofs; Introduction to Abstract Algebra; Introduction to Mathematical Logic; Optimization; Introduction to Topology; Real Analysis*

Electrical Engineering: Electric Circuit Analysis I; Digital Systems Design; Computer Organization; Introduction to Probability, Statistics, and Random Processes; Network Performance Analysis; Embedded Systems Design

*Denotes in progress courses

Honors and Awards

APS DLS Travel Grant (2025)

Competitive travel grant awarding up to \$1000 for travel expenses to FiOLS.

President's List (F22, S23, F23, S24, F24, S25, F26)

Awarded for maintaining a 4.0 GPA in the given semester.

Provost's Student Academic Achievement Award (2025)

Merit based scholarship awarded by the Provost's office at Miami University for outstanding academic performance and contribution to the Miami University community.

College of Arts and Sciences Dean's Scholar (2025)

Merit based scholarship awarded by the College of Arts and Sciences at Miami University to be used in research during the senior year of the recipient.

Astronaut Scholarship Nominee (2025)

Goldwater Scholarship Nominee (2025)

R. L. Edwards Scholarship (2024-2025)

Scholarship awarded by the Physics Department at Miami University for academic performance. This is the department's outstanding sophomore award.

George Arfken Physics Award (2023-2024)

Scholarship awarded by the Physics Department at Miami University for academic performance.

J.A. Culler Physics Prize (2023-2024)

Scholarship awarded by the Physics Department at Miami University for academic performance. This is the department's award for outstanding performance in an introductory course.

Mary and Clifford Harvey Scholarship (2023-2024)

Scholarship awarded by the Mathematics Department at Miami University for academic performance.

J.P & P.J Albert Scholarship (2023-2024, 2024-2025)

Scholarship awarded by the Mathematics Department at Miami University for academic performance.

Commendation in Undergraduate Research (2022-2023, 2023-2024, 2024-2025)

Awarded by the Physics Department at Miami University for research done with Dr. Mirza.

Dr. Benjamin Lee Memorial Scholarship (2022-2023, 2023-2024, 2024-2025)

Scholarship awarded by the Physics Department at Miami University for academic performance.

Congressional Award Gold Medalist (2022)

Award given by Congress to American youths (ages 14-23) to recognize initiative, service, and achievement. The Gold Medal requires 400 hours of voluntary public service, 200 of physical fitness, and 200 of personal development, each spread across at least 24 months, as well as the successful planning and execution of a 5 day/4 night expedition or exploration.

Activities**Academic****Pi Mu Epsilon Member (2024-2025)**

- Mathematics honor society dedicated to promoting mathematics and recognizing talented students pursuing mathematics.

Putnam Exam (2024-2025)

- I took the 2024 and 2025 Putnam exams, a prestigious and competitive undergraduate mathematics exam.
- I practice with the Putnam team at Miami University where we work through old problems and problem solving techniques.

Miami University Physics Departmental Mentor (2023-2025)

- I mentor first year students as they transition into being a physics major at Miami.

Mathematics Department Competitive Exams (2023-2024)

- I took the Patterson exam (a competitive exam for first year students) in 2023, and the Pi Mu Epsilon exam (the version for second year students) in 2024. I was the top scorer on the Pi Mu Epsilon exam.

Society of Physics Students (2022-2025)

- I attend weekly meetings and help with various outreach/volunteer events that the organization is involved in.

Personal**Miami University Ballroom Dance Club**

- President (Fall 2025 - Spring 2026)

I teach lessons for both the social club and competition team, maintain the club website, and organize logistics for all events hosted by the club.

- Lesson Coordinator (Spring 2023 - Spring 2025)

I plan (and sometimes teach) the lessons for both the social club and competition team, as well as organize pre-competition workshops with our coaches.

- Competitor (Fall 2022 - Present)

I compete at the Bronze/Silver level in Smooth/Standard/Rhythm/Latin events at various competitions in the Midwest, including Ohio Star Ball Collegiate Challenge and the Arnold DanceSport Classic.

Lifetime Girl Scout

- Camp Core Staff (School Year 2023-2024, 2024-2025, 2025-2026)

I help run various activities organized by Girl Scouts of Western Ohio throughout the year, including various overnights, camping trips, and high ropes experiences.

- Outdoor Living Skills Specialist/Lifeguard at Girl Scout Troop Adventure Camp (Summer 2023, 2024)

In addition to the tasks of a Junior Instructor, I was responsible for the inventory, upkeep, and training so that outdoor living skills activities run smoothly. I also helped to run more strenuous activities, such as archery, the climbing wall, and both the high and low ropes courses.

- Junior Instructor/Lifeguard at Girl Scout Troop Adventure Camp (Summer 2021, 2022)

I served as unit hostess, where I explained rules and helped campers settle in and prepare to depart; ran activities, such as fire building, knife safety, and various crafts; lifeguarded; and served as a role model for campers as I completed other necessary tasks for keeping the camp running.