

Benjamin Nussbaum

[benjaminussbaum.xyz](mailto:benjamin@benjaminussbaum.xyz)

benjamin@benjaminussbaum.xyz

(802) 373-8662

Education

Ph.D. in Physics *University of Illinois at Urbana-Champaign* Urbana-Champaign, IL
Advisor: Prof. Paul Kwiat 2021–2026 (Expected)

B.S. Optics, B.A. Physics & Astronomy *University of Rochester* Rochester, NY
Minor in Mathematics 2017–2021

GPA: 3.9—*Dean's List, all eligible semesters*

Awards and Recognitions:

- ★ 2021 NSF GRFP Honorable Mention
- ★ 2020 SPIE Optics and Photonics Education Scholarship
- ★ Dean's Citation for Broadening Participation in Research
- ★ Xerox Award for Innovation and Technology

Highlighted Courses: Fourier Optics (Graduate Level) · Advanced Lens Design (Graduate Level)
Quantum/Nano Optics Lab. (Graduate Level) · Modern Statistics & Large Data Sets (Graduate Level)

Research Experience

Research Intern *Quantum Information Science Group, Oak Ridge National Lab* *Oak Ridge, TN
Advisor: Dr. Joseph Lukens *Remote position due to the Coronavirus pandemic Summer 2020

- Analyze and understand an optical fiber-based quantum frequency processing system
- Design a component level model for quantum frequency processing on an integrated photonic chip

Research Assistant *The Institute of Optics, University of Rochester* Rochester, NY
Advisor: Prof. Nick Vamivakas Summer 2019–Spring 2020

- Design and build custom optical system, align the system and laser
- Apply Fourier analysis in MATLAB on image data to demonstrate control of spatial coherence
- **Paper published in *OSA Continuum*:**
S. A. Wadood et al. "A Fourier processor for partially coherent fields". In: *OSA Continuum* 3.10 (Oct. 2020), p. 2843. DOI: [10.1364/osac.395511](https://doi.org/10.1364/osac.395511). URL: <https://doi.org/10.1364/osac.395511>

Leadership

President *University of Rochester* Rochester, NY
Optical Society (OSA) Student Chapter Fall 2019–Present

- Engage students in professional development workshops, outreach opportunities, and social events
- Manage club, lead meetings, interface with advisors, provide vision: more cross-year interaction

President *University of Rochester* Rochester, NY
Undergraduate Philosophy Council Fall 2020–Present

- Engage students in casual yet thoughtful discussions of various philosophical topics
- Manage club, facilitate meeting discussions, interface with advisors
- Topics include: epistemology, metaphysics, theory of consciousness, AI, medical ethics, and more

Teaching

Teaching Assistant *The Institute of Optics, University of Rochester* Rochester, NY
Interference and Diffraction, Prof. Nick Vamivakas *Spring 2021*

- Lead a weekly recitation section to give students another perspective of course material.
- Hold office hours and answer questions about course material and homework by email.
- Coordinate assignment grading with Prof. Vamivakas and other TAs

Teaching Assistant *The Institute of Optics, University of Rochester* Rochester, NY
Geometrical Optics, Prof. Julie Bentley *Fall 2020*

- Hold two office hours per week to answer student questions about course material
- Coordinate assignment grading with Prof. Bentley and other TAs

Lab Teaching Assistant *The Institute of Optics, University of Rochester* Rochester, NY
Geometrical Optics, Physical Optics; Profs. Berger, Brown, Carney, Eastman, & Zavislan *2019–2020*

- Facilitate teaching lab experiments for students, grade and answer questions about labs and reports
- Lead small groups during pre-lab sessions for students to explore lab equipment

The “ \LaTeX Expert” *OSA and SPS Student Chapters, University of Rochester* Rochester, NY
Offer experienced guidance and solutions to \LaTeX formatting questions. *Spring 2020*

- Next-level lab reports
- Elegant equations
- Forget finicky figure placement
- Streamlined citations
- Professional presentations and posters
- Righteous résumé templates

Teaching Assistant *The Institute of Optics, University of Rochester* Rochester, NY
Optical System Layout/Analysis *Spring 2020*

- Review and answer questions about assignments, making use of Zemax optical design software
- Coordinate course organization and direction with professor

Workshop Leader *The Institute of Optics, University of Rochester* Rochester, NY
Geometrical Optics, Prof. Julie Bentley *Fall 2019*

- Lead weekly workshops of a small group of students
- Facilitate work on solving problems extending important class topics and ideas

Photon Camp Counselor *The Institute of Optics, University of Rochester* Rochester, NY
Photon Camp *Summer 2019*

- Guide high school students through various labs/experiments and teach them about optics
- Advise a team of four in the completion of a capstone project and poster presentation

Campus Activities

Professional Development Committee *University of Rochester* Rochester, NY
Society of Physics Students *2018–Present*

- Coordinate with committee of 5-10 students to plan and run professional development events:
- Research panels, technology workshops, REU/summer program info sessions, Ask Seniors Anything

Undergraduate Philosophy Council *University of Rochester* Rochester, NY
Casual philosophical discussion group *2017–Present*

- Participate in weekly meetings of 3-7 students to casually discuss topics of philosophical merit:
- Theory of Consciousness, Determinism, Existentialism, Automation, Genetic Engineering...