Evelyn Ferwalt

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EDUCATION

University of Rochester (UR) **Rochester, NY**
Bachelor of Science, Electrical & Computer Engineering Major *May 2023*
- Cumulative GPA: 3.84 out of 4.00

RESEARCH EXPERIENCE

ECE Design Seminar – Advised by Dr. Jack Mottley, PhD **Rochester, NY**
MILDFIRE Project Lead *August 2022 – Present*
- Analyzed and evaluated amplification circuitry surrounding various midwave imaging systems, such as thermopile- and photodiode- solutions, toward a custom circuit design specialized for CubeSat imaging.
- Coordinate a team of three to effectively distribute imager-amplification and packaging research foci.

MIT Lincoln Laboratory – Advised by Dr. Cheryl Sorace-Agaskar, PhD **Lexington, MA**
Intern, Group 89: Quantum Information and Integrated Nanosystems *June 2022 – August 2022*
- Used Lumerical to simulate midwave Ge ring resonators, sweeping parameters such as gap and radius through desired values for quantitative comparison to fabricated devices.
- Tested SiN waveguides and ring-resonator structures to characterize wavelength response in LabView.
- Created a modular Lumerical script to build geometry for an integrated Quantum Cascade Laser.

The Lab of Dr. Jaime Cardenas, PhD **Rochester, NY**
Undergraduate Research Assistant *May 2021 – Present*
- Received individual NSF funding to join the Institute of Optics 2021 NSF Summer Photonics REU cohort.
  - Designed, programmed, and built integrated photonic thermal test setup using Arduino, Peltier heating and cooling modules, and electrical/thermodynamic engineering design practices.
- Hired by the Institute of Optics to continue on-campus research.
  - Analyzed and modelled temperature effects on fiber-to-chip coupling efficiency.
  - Created project design proposal for an electrode-arc based fiber-to-chip fusion device.
  - Designing an Altium PCB layout for an integrated photonic 36-photodiode fanout and amplifier.

PROJECTS

MIT Lincoln Laboratory Intern Innovation Idea Challenge (I³C) **Completed August 2022**
- Proposed the Midwave Imaging and Lasercom Device for Fire's InfraRed Emissions (MILDFIRE), a CubeSat constellation purpose-built for wildfire early detection.
- Coordinated a team of four to investigate manufacturing technologies, while seeking out experts in several Lincoln divisions for professional insight into launch feasibility and cost estimates.
- Awarded first place over 38 other proposals, earning $1,500 and official Lincoln support from the final presentation judged by a panel including the lab's director Dr. Eric Evans and several division leaders.

MakeMIT Hardware Hackathon Winner: Snap Gloves **Completed March 2021**
- In a team of three, designed, proposed, and built a functioning motion-tracking glove wearable.
- ESP32-based project won award for Innovative Use & Incorporation of 5G/IoT/Sensors.
- For complete overview, see https://devpost.com/software/handy-sr8y9u

7-Segment Hexadecimal Decoder FSM **Completed November 2020**
- Used EAGLE and AutoCAD to singlehandedly design, lay-out, and technically describe a custom PCB.
- Fabricated final logic-design-based board through OSH Park using After Dark service.
- Powerup was successful first try; for complete overview, see https://tinyurl.com/Ferwalt7SegSlides

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SELECTED ENGINEERING COURSE PROJECTS

Integrated Circuits Design & Analysis   **Completed August 2022**
- Designed a two-stage integrated hi-fi headphone power amplifier in LTSpice, optimizing for specified performance in power delivery, input/output impedance, and total harmonic distortion.
- Received full marks on final demonstration and report after successful first-try breadboard testing.

Quantum Electronic Materials & Devices   **Completed August 2022**
- Used Qiskit and sequential quantum gates to implement quantum teleportation, in addition to Deutsch-Jozsa Algorithms on balanced and unbalanced input oracle functions.
- Simulated and compared results to output of physical IBM superconducting quantum computer.

Interference & Diffraction   **Completed May 2022**
- Used superposition of complex wavefunctions to define and characterize the focal point of an ideal lens, using MATLAB to visualize and measure the transverse and longitudinal irradiance FWHM.
- Represented UR in an international collaboration with a 2-student team at the École Centrale de Marseille in France, comparing results and sharing alternate approaches to wave optics phenomena.

PRESENTATIONS

Electrode-Arc Fusion Splicing for Fiber-to-Chip Photonic Interconnects
National Collegiate Research Conference   *January 22nd, 2022*
Hosted by the Harvard College Undergraduate Research Association

Utilizing Campus Resources for Independent Projects: Design Process of 7-Segment FSM PCB
UR IEEE Student Chapter   *December 7th, 2021*

High Temperature Reliability Testing of Photonic Packaged Devices
Industrial Associates Poster Presentation   *October 21st, 2021*

Automated Environmental Chamber for Reliability Testing of Photonic Devices
NSF Summer Photonics REU Final Research Presentation   *July 29th, 2021*

CAMPUS LEADERSHIP ACTIVITIES

Tau Beta Pi NY Kappa Chapter   **Rochester, NY**
President   *January 2022 – Present*
Vice-Chair, Diversity, Equity & Inclusion Committee   *TBP National Convention, September 29th 2022*
- Coordinated an administrative team of 6 students to perform all executive duties, establishing and maintaining communication between our chapter, TBP HQ, and the UR student organization office.
- Organized and hosted chapter events with 45+ attendees including full record of participation.

University of Rochester IEEE Student Branch   **Rochester, NY**
Vice President   *June 2021 – Present*
- Presented an independent research talk as part of professional research and industry lecture series.
- Supported President in all event planning, member engagement, and IEEE promotional efforts.

SKILLS

- Lumerical MODE and FDTD simulation
- MATLAB, C/C++, and Python proficiency
- Test automation and data analysis
- PCB design & layout in EAGLE and Altium
- Low-frequency circuit design in LTSpice
- Electrical lab fundamentals, e.g., soldering