

LUKE WEAVER

Stanford, CA • ljweaver@stanford.edu

EDUCATION

Doctor of Philosophy in Physics

GPA: IP

Stanford University, School of Humanities and Sciences, Stanford, CA

Expected Graduation: May 2030

Bachelor of Science in Physics, with Highest Honors

GPA: 4.0

Lehigh University, College of Arts and Sciences, Bethlehem, PA

Awards and Honors

Lehigh University Honors Convocation

Spring 2024, Spring 2025

Maintaining a 4.0 GPA for three years

Goldwater Scholarship Nominee

Fall 2023

Selected as one of Lehigh University's Goldwater candidates

Iacocca International Internship Program

Fall 2022

Highly selective fully funded international internship program

Relevant Coursework (2021-2025)

Nonlinear Optics, Plasma Physics, Quantum Mechanics II (Graduate Level), General Relativity, Selected Topics in Gravity and Quantum Field Theory, Quantum Field Theory, Introduction to String Theory

PUBLICATIONS & PAPERS

[1] Transport-Induced Decoherence of the Entangled Triplet

July 2025 – arXiv

Exciton Pair ([Link](#))

III, G. C., **Weaver, L. J.**, Rex, Z., & Biaggio, I. (2025). Transport-Induced Decoherence of the Entangled Triplet Exciton Pair. *arXiv [Quant-Ph]*. Retrieved from <http://arxiv.org/abs/2507.23770>

[2] SLOSH Measuring Sensor System for Liquid Carrying Robots ([Link](#))

November 2024 - IEEE

L. J. Weaver, S. M. B. P. Samarakoon, M. A. V. J. Muthugala, M. R. Elara and Z. S. Saldi, "SLOSH Measuring Sensor System for Liquid Carrying Robots," in *IEEE Sensors Letters*, doi: 10.1109/LSENS.2024.3473688.

Sensor Letters

[3] Characterization and Simulation of the H6 Secondary Beamline for Beam Spot Reduction ([Link](#))

October 2024 - CERN

Document Server (CDS)

Weaver, L. (2024). Characterization and Simulation of the H6 Secondary Beamline for Beam Spot Reduction. CERN Document Server.

[4] Persistence of Spin Coherence in a Crystalline Environment ([Link](#))

July 2024 – Physical

Review Letters

Curran, G., Rex, Z., Xallan Wilson, C., **Weaver, L. J.**, & Biaggio, I. (2024). Persistence of Spin Coherence in a Crystalline Environment. *Phys. Rev. Lett.*, 133, 056901. doi:10.1103/PhysRevLett.133.056901

RESEARCH EXPERIENCE

Lehigh University, Bethlehem PA, Undergraduate Research Assistant

December 2022 – August 2025

- Worked with femtosecond laser to induce fluorescence and detect its dynamics by time-correlated single photon counting
- Used MatLab and Python to analyze data on photon arrival times and extract fluctuations connected to quantum interference
- Worked on theoretical analysis of entangled spin states in pairs of triplet excitons generated by singlet fission
- Co-Author of [paper](#) published in Physical Review Letters, highlighted as an Editor's Suggestion [4]
- Co-Author of [preprint](#) [1]

European Organization for Nuclear Research (CERN), Switzerland, Research Intern

June – August 2024

- Worked in Beams Department (BE-EA-LE) to develop proposal for extension of the H6 Secondary Beamline to further focus particle beam
- Created solutions using Methodical Accelerator Design (MAD-X) framework and modeled entire beamline using Beam Delivery Simulation (BDSIM), utilizing Monte Carlo techniques to simulate the beamline, obtaining estimates for performance
- Designed and performed experiment varying quadrupole (focusing magnet) strengths to confirm simulated results and determine emittance of the beam
- Wrote [report](#) accessible in the CERN Document Server [3]

Singapore University of Technology and Design, Singapore, Research Assistant

June – August 2023

- Designed and soldered sensor array to measure surface displacement of water mounted on a robot
- Wrote hardware level code to implement communication between devices including Serial, Bluetooth, and I²C protocols
- Made programs to utilize Delaunay Triangulation and Cubic spline interpolation (in Python and MatLab) to construct a three-dimensional map of the water over time
- First author of [paper](#) published in IEEE Sensor Letters [2]

Fruitful, LLC, New York, Independent LLM Researcher

January – February 2023

- Performed a large-scale literature review pertaining to the efficacy and viability of developing an LLM for use in a domain specific area
- Determined useful metrics to facilitate comparison of the current LLMs
- Compiled both a document and presentation including all relevant information and presented findings to organization

TEACHING EXPERIENCE

Lehigh University, Apprentice Teacher for Advanced Physics Lab

(PHY 220 & PHY 221)

August 2024 – December 2024

- Wrote lectures and presented to students on the topics of circuit analysis, phasor and Laplace transformations, Lock-In Amplifiers, Python programming, and firmware/software development
- Assisted students with completing lab work and troubleshooting efforts
- Graded and provided feedback on lab papers

Lehigh University, Peer Tutor
(MATH 075, MATH 076, ECE 033, ECE 081, PHY 21)

August 2023 – May 2025

- Facilitate group tutoring sessions with 10+ students
- Outline problem solving frameworks and present short lectures on the class material
- Reinforced core concepts in small group sessions

PROFESSIONAL EXPERIENCE

Passr Technologies, LLC, Co-Founder

December 2021 – Present

- Implement front-end and back-end features
- Manage product and project trajectory
- Consider and direct UI/UX interactions and enhancements

Quantum Dynamix, LLC, Lancaster PA, Freelance Software Engineer.

February 2022 – May 2022

- Identified and generated solutions to remove bugs and improve stability
- Managed two websites and one web application—implementing new views and improving search algorithms
- Established professional relationships with clients to communicate expectations and project scope

Benefix, LLC, Lancaster PA, Associate Software Engineer

June 2019 – July 2021

- Implemented front-end and back-end features and maintained software across the codebase
- Led large scale API integrations integral to the operations team, responsible for syncing 1,000+ clients between different databases
- Spearheaded a major redesign of the client workflow and facilitated design reviews for new features

SKILLS

- **Programming Languages/Frameworks** – Java, C++, JavaScript, Ruby, MatLab, Julia, Python, HTML/CSS/SCSS, SQL/PostgreSQL, Root, Beam Delivery Simulation (BDSIM)/GEANT4, MAD-X
- **Laboratory Skills** – Optics, Laser Usage, Cryostat Operation, Crystal Growth via Physical Vapor Deposition, Interferometry, Monochromator Operation, Crystal Microscopy
- **Hardware Development** – Arduino, Raspberry Pi, PCB/PCBA Development