

ISAAC GALLEGOS

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Education

Colorado School of Mines, Golden, CO **Dec 2024**
Bachelor of Science, Engineering Physics *GPA: 3.99/4.00*

Courses: Laser Physics, Electromagnetic Waves and Optical Physics, Microbiology, Advanced Physics Lab I and II, Digital and Analog Electronics

Research Experience

Research Engineer – Wellman Center for Photomedicine, Harvard Medical School, & MGH **Feb 2025 – Present**
Research scientist *Boston, MA*

- Recruited as a Research Intern and was subsequently promoted to a full-time Research Engineer role to lead a project.
- Develop advanced medical imaging technology for spectroscopic Photoacoustic (PA) imaging and Optical Coherence Tomography (OCT) applications.

Experience

Assistant Teacher - Colorado School of Mines **Aug 2023 – Dec 2024**
Course Assistant *Golden, Co*

- Assistant Teacher for Mathematical Physics (Fall 2023), Intermediate Electromagnetism (Spring 2024), and Electromagnetic Waves and Optical Physics (Summer 2024 and Fall 2024).
- Fostered an inclusive learning environment, engaged with students from diverse backgrounds, effectively explained problem processes and concepts, developed course content - wrote exams and homework, and held office hours & supplemental lectures.

Academic Projects

Pr:YLF Solid State Laser **Aug 2024 – Dec 2024**
Project Co-Lead *Golden, CO*

- Designed, constructed, and characterized a diode pumped Pr:YLF solid-state laser. Demonstrated optical design, theoretical knowledge, and laboratory techniques.

Diode Pumped Nd:YAG Laser **Fall 2024**
Project Lead *Golden, CO*

- Demonstrated short pulse generation by passive Q-switching of an Nd:YAG laser with a Cr:YAG saturable absorber.
- Computationally modeled Q-switching to verify experimental results. Characterized pulse repetition rates, time durations, and pulse energy to demonstrate laser functionality.

Photon-Counting Circuit – CSM **Fall 2023**
Project Co-Lead *Golden, CO*

- Designed and constructed a circuit that counted photons utilizing sequential and combinational digital logic demonstrating the power of circuit design.
- Circuit was designed in Quartus Prime and was mapped to an FPGA device, which was wired to seven-segment displays to show detected photon counts continuously.

Micron-Scale Supersonic Jet Nozzles **Fall 2023**
Project Lead *Golden, CO*

- Led a team of five undergraduates to model, validate, and prototype two micron-scale supersonic jet nozzles for the Durfee Group under the Ultrafast Laser Research Laboratory at the Colorado School of Mines.
- SolidWorks Flow Simulation software was utilized which led to effective computational fluid dynamics assessments on gas flows.
- Mathematica software platform was utilized with fluid dynamics equations enabling characterization of nozzle dimensions for various gases.

Skills

Interpersonal: leadership, organization, attention to detail, highly analytical, adaptability, oral and written communication, personal accountability, teamwork

Software and Programming Languages: MatLab, Python, Mathematica, SolidWorks, LabVIEW, COMSOL, Zemax OpticStudio, Quartus Prime, Fusion 360, Latex

Laboratory Techniques: laser calibration, optical alignment, Circuit & PCB Design, Photoacoustic microscopy, Optical Coherence Tomography (OCT), Interferometry, scanning electron microscopy, thermal deposition, sputtering, ellipsometry, soldering, TIG welding, vacuum pumps, circuit analysis, tissue phantoms, PPE and lab safety practices

Honors and Awards

- Undergraduate Student Government (USG) representative
- Tau Beta Pi and Sigma Pi Sigma Honor Societies
- Taekwondo - first-degree black belt