

OPTICS103

Education

Masters of Science | Applied Physics | University of Oregon | 2017- Current

- Major: Applied Physics in Optical Material and Devices

Bachelors of Science | Applied Physics | University of Oregon | 2014 - 2017

- Major: Applied Physics
- Minor: Mathematics

Research & Technical Experience

Optics Research | University of Oregon | Dr. Bryan Boggs | Sept 2016 – Dec 2016

- Performed Spontaneous Parametric Down-conversion (SPDC) in a nonlinear Barium Borate (BBO) crystal to make second-order coherence measurements of quantum and classical light fields.
- Designed and built a quantum eraser that has been added onto the SPDC setup by building a double slit interferometer using a specialized drill press.
- Improved the efficiency of the SPDC setup by accurately measuring the correct amount of down-converted photons and updating the web page to include the correct values.

Semiconductor Research | University of Oregon | Dr. Bryan Boggs | Mar 2016 – Jun 2016

- Improved a homemade liquid nitrogen cryostat by building leg mounts using a mill, lathe, and drill press from the University of Oregon (UO) machine shop.
- Created and installed an optical mount into the cryostat that was then used for housing a laser diode and can be utilized for analyzing the optics of semiconductors.
- Researched and referenced more than 10 different sources of literature that were used to help spearhead the project and develop effective methods for cooling.

Superconductor Research | University of Oregon | Dr. Bryan Boggs | Jan 2016 –Mar 2016

- Implemented a Superconducting Quantum Interference Device (SQUID) that is used to detect extremely small magnet fields using different types of precise electronic circuits and lab equipment.
- Determined the critical temperatures and currents of two types of high temperature superconducting material using liquid nitrogen and a specialized thermocouple in order to observe the Meissner Effect.
- Explored the use of superconductors as energy storage devices by inducing a current and measuring its lifetime using general lab equipment and a variety of techniques.
- Collaborated with a partner for a minimum of 15 hours a week to successfully accomplish a variety of different research goals.

Research Assistant | University of Oregon Physics Department | Dr. Bryan Boggs | 2016-2017

- Built and organized a fiber optics station used in a UO undergraduate lab which helped to streamline fiber optic processes.
- Implemented fiber optics manufacturing posters used to help guide students through successfully creating, polishing, terminating, and splicing fiber optic cables.
- Aided with the set up and repair of a liquid helium refrigerator by installing vacuum components and a precise thermocouple that allows for precise monitoring of its internal pressure and temperature.
- Troubleshoot and repaired a constant current driver circuit used to power a homemade laser by assessing the broken driver, determining which electronics were defected, and soldering in new ones.

Related Experience

- Utilized Optic Studio to develop and optimize simple optical setups used in many industry settings.
- Supervised 5-10 person work teams daily as a construction manager in order to accomplish deadlines set by customers without going over time requirements.
- Built over 10 houses using different building and designing techniques while utilizing the use of power tools, general construction equipment, and AutoCAD.
- Organized permits and other official paperwork to ensure legality requirements set by the City of Redding.
- Volunteered more then 10 hours a week of extra time to Carlson Construction to ensure smooth operation.

Awards

- Nominated by faculty to receive the UO Weiser Project Lab Award through the physics department.