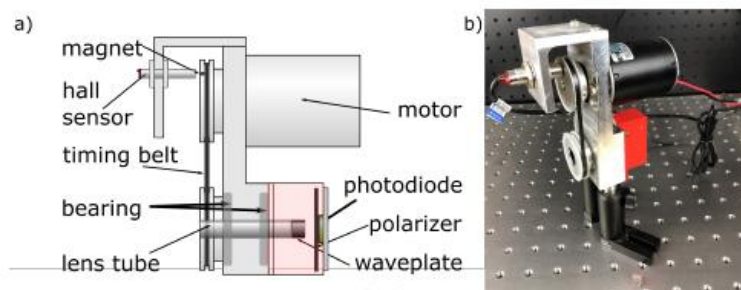


Portable Real-Time Polarimeter for Partially and Fully Polarized Light

Professor Connor Kupchak

Optical polarization plays a key role in the quantification of numerous physical processes with applications in atomic and molecular optical physics, astronomy, imaging, and material science. Monitoring the polarization of time dependent light from a process can reveal insight into a physical system. Furthermore, several optical technologies such as optical isolators and photonic waveguides require a precise tuning of the input polarization state. Having a portable real-time polarimeter is thus a useful tool across many research and industrial optical settings.

This project will design an integrated polarimeter system capable of real time visualization and acquisition of the polarization state and an optical field. The system is easily calibrated to accommodate a broad range of light levels and wavelengths.



Group Member 1: Optical Theory and Calculations. This includes imperfections and noise

Group Member 2: Construction of polarimeter device and debugging of the physical tools.

Group Member 3: Programming and device and control using Raspberry Pi. Also, the data acquisition programming

Group Member 4: Development of front-end user interface (GUI) to give polarimeter data in understandable manner. Key aspect is data visualization tools. Will work closely with both GM#1 and GM#2.

Project Details:

-Components of the project will be assigned in a modular fashion, allowing students to take on their own individual component. Success in the project will require effective collaboration and communication among team members.

-Meetings will ideally occur in-person meetings on Carleton campus. Meetings may shift to a remote format in accordance with current health guidelines.