

## INTRODUCTION

Next week (Oct. 25<sup>th</sup>) will be the last task-oriented lab. It will be on diffraction. After that there are only four more lab sessions left before finals week. You will have to choose a project, work on it, write a formal lab report, and make a presentation. I would like for you to work in pairs of your own choosing.

There are many possible topics for you to choose from. Your topic may be an extensions of a topic we covered in the lab, or a topic you covered in lecture. Here are some possibilities:

### Polarization Measurement

We had two weeks on polarization, but there are more experiments you can do including automating the polarization measurements or partial polarization.

### Diffraction

This is a very important topic in the wave nature of light. You can use lasers of different wavelengths and different objects to explore diffraction. Possible ideas include measuring the thickness of a hair, looking for Fresnel's bright dot (Google it), printing a custom diffraction pattern, and multiple slits.

### Interference

This is another topic in the wave nature of light. There are several Michaelson interferometers you can set up and make measurements with. The wavelength of a laser and the index of refraction of air are possible measurements.

### Spectrograph

You can build a spectrograph to measure the light intensity versus wavelength for various sources.

### Telescopes & Microscopes

Telescopes and microscopes are important optical instruments. I can provide two different telescopes for you to measure and explore the optics of. Possible projects are making a projection telescope and using a telescope with a web cam.

## REQUIREMENTS

- ☐ You will need to write a formal report on your project. You must do this individually.
- ☐ You also must present a poster of your project.
- ☐ You will orally present your poster during the lab meeting during Finals week.

The schedule is as follows:

Nov. 1	University Holiday
Nov. 8	Project work
Nov. 15	Project work
Nov. 29	Thanksgiving Break
Dec. 6	Project work
Dec. 3	Drafts of Report and Poster are due
TBD (Finals Week)	Presentations and final Report due.