

### Laboratory Information

The main aim of these labs is to give you real hands-on experience with optical instrumentation and to introduce you to some of the phenomena of physical optics. The laboratory will count for 20% of your total grade in Physics 481. The labs will start on the second week of classes (week of January 12) and go on until the last week of classes (week of March 9). The lab grade will be based on weekly grading of laboratory reports. See guidelines for lab report preparation. Please prepare for each lab: each lab task will have a reading assignment, which you need to do before the lab. If you come to the lab unprepared, you will not be able to finish all experiments you have to do.

#### Safety:

The primary safety concern in the lab regards the lasers that are used for most of the experiments. These helium neon lasers emit 2 mW of light at 633 nm, which is enough to cause damage to your eyes. The only safe way to view the beam or any of its reflections is to have it strike a diffuse reflector, such as a card. Take care to keep the beam parallel to the table top and confined within your table area. Remove your watch and other reflective jewelry when working with the lasers, so stray reflections are not produced. Unless absolutely necessary for your experiment, do not let the beam propagate outside of your table. Use the provided beam stops (stack of razor blades). Also note that the laser has a shutter on the front which will allow you to turn off the beam without turning off the laser power supply.

#### Equipment:

- Do your best to preserve the equipment for the future.
- Avoid fingerprints on optical surfaces. The screws used to assemble components are often oily, so clean your hands after using them and before handling optics.
- Do not over tighten screws.
- Use the correct screw for the task at hand. Most of the screws you will need are 1/4-20 (1/4" diameter and 20 threads per inch) or 8-32 (#8 screw with 32 threads per inch). The distinction between the two is obvious. However, some threaded holes or screws in the lab may be metric. Do not force a screw if it feels tight. Most likely the threads are metric or they are damaged. A 1/4-20 screw will go a few turns into an M6 (6 mm diameter with 1 thread per mm) threaded hole and a 8-32 screw will go a few turns into an M4 (4 mm diameter with 1 thread per mm) threaded hole; **but don't do it!**