

Departments of Physics and ECEE
University of Colorado at Boulder

ADVANCED OPTICS LAB -PHYS/ECEE 5606

Prof. Kelvin Wagner and Rafael Piestun

Organizational Meeting 12:00 Wed Jan 17 in OCS Conf rm, ECEN 1B45

Lectures Mondays 12:00-1:45, extra lectures MWF 12:00-1:45 first 2 weeks

Labs All day and into the night on either Tuesdays or Wednesdays. But flexible

Prerequisites: Graduate Optics course such as ECEN 5696-Fourier Optics, ECEN 5156-Physical Optics, or ECEN 5645-Optical Electronics/PHYS 5560-Lasers.

The optics lab consists of 9 experiments (although that may expand to 12) which introduce some of the techniques and devices essential to experimental work in modern optics and some fun modern applications. from both the Physics and Engineering perspectives. Labs will be offered in the ECE optics lab (ECEE105). Once a week lectures are schedulaed as Mon 12:00-1:50 ECEN265 but that may change, but will meet 2-3 times per week for the first 2 weeks and only once a week after that. Lab sessions will require a full day on either , Tuesday or Wednesday, and conflicts with the escheduled time are OK because labs will literally **require a full day**. The last month will be a self-paced student-designed project in areas of interest to groups of students in topics such as nonlinear optics, fiber optics, or computational imaging, using the avialable resources in the Advanced Optics Lab and COSI lab as well as through collaborations with interested faculty. The Optics lab is only offered every 2 years, so you should take it now if you are interested.

List of Experiments

1. Interferometers
2. Polarization and Crystal Optics
3. Fourier Optics
4. Spectroscopy
5. Photorefractive Crystals
6. Acousto optic Devices
7. Optical Coherence Tomography (OCT)
8. Wavefront Sensing and Adaptive Optics
9. Spatial Light Modulation (SLM)
10. Project in Nonlinear Optics, Fiber Optics, Computational Imaging, etc