

## Microwave Optics

### **Introduction:**

We are most familiar with electromagnetic (EM) waves as visible light. This microwave laboratory explores EM waves with large wavelengths (centimeters) in contrast to the visible light variety (wavelengths of 380 to 770 nm). Using microwaves, you will study a variety of wave phenomena including polarization, interference, and diffraction.

**Suggested Reading:** The optics textbook, *Optics*, by E. Hecht & A. Zajac (available in room 377) will be helpful. Also, reviewing the optics discussions in your introductory physics textbook (e.g., for PHY 211/212) will be useful.

**Guidelines:** We will use the writeup provided by Pasco Scientific as a basic guide for this project. Follow the suggestions in the Pasco packet and address the questions that are posed there. However, please avoid using this as a “cookbook recipe” for the experiments. If there are portions of the experiment where it would be sensible to make further measurements or plots of your data, beyond what is suggested by Pasco, please do this. Of course, you should feel free to consult with the instructor and TAs. As with all projects in this course, be sure to include clear diagrams of your experimental setup, as well as descriptions of your measurement process and method for determining your measurement uncertainties.

At a minimum, you should complete the following experiments described in the Pasco writeup

1. Experiments 1 - 6
2. Choose 2 from Experiments 7 - 9
3. Choose 1 from Experiments 10 - 12