

HOLOGRAPHY (HOL)

Watch the Holography experiment and Laser Safety videos.

Student's Name _____

Partner's Name _____

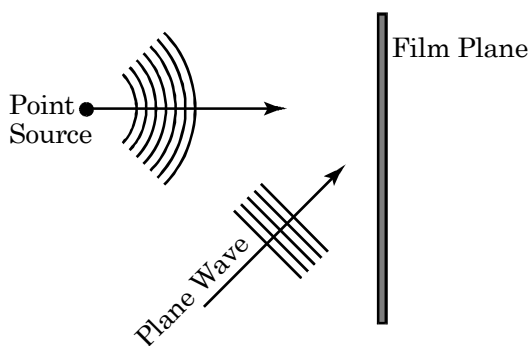
You must watch the [Laser Safety Video](#) before you turn on any equipment. This includes the reading of training materials, viewing a safety video, taking a written quiz, and completing the Laser Safety Training Certification then hand in the forms and quiz into the 111-Lab staff before beginning the experiment.

Must watch the video on Holography <http://128.32.210.103/hol.wmv>

Pre-Lab Discussion Questions and sign off sheet

It is your responsibility to discuss this lab with an instructor on the first day of your scheduled laboratory period. This signed sheet must be included as the first page of your report. Without it you will lose 1/3 of a letter grade. You should think about and be prepared to discuss at least the following before you come to lab:

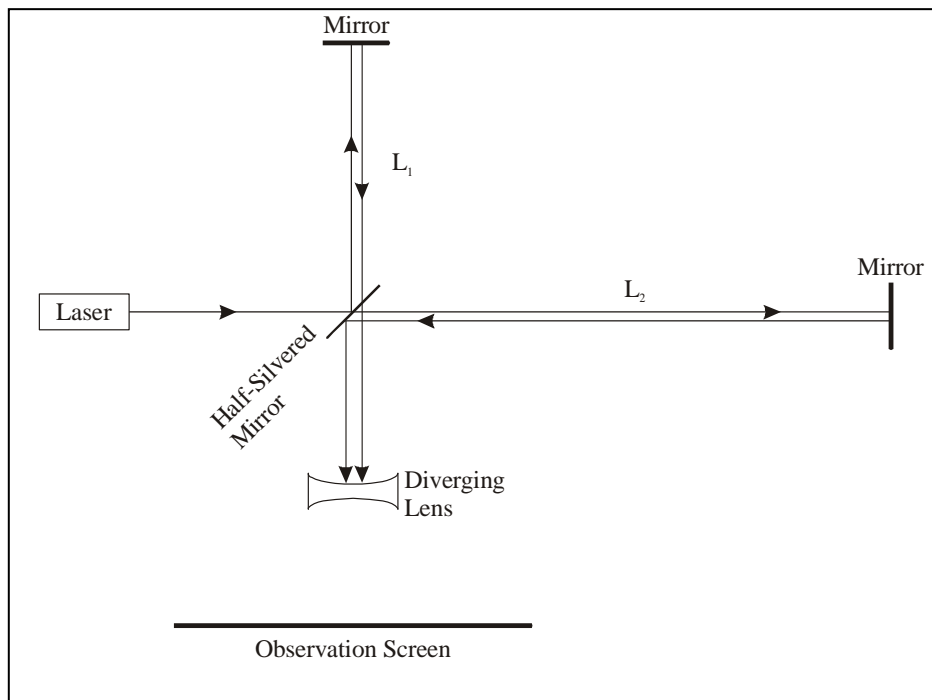
1. What is a hologram? Students often respond that a hologram preserves 3-D information while a regular picture only contains 2-D information. That statement is too vague. Specifically, what “extra” information is contained in the diffraction pattern that makes up a hologram? How is it encoded? For example, what does the diffraction pattern caused by a plane wave (the reference beam) interfering with light from a point source (a simplified object) look like? See figure. How does this pattern change as the point source changes position (x,y,z) ?



more pre-lab questions on the next page

Pre-Lab Discussion Questions Continued

2. How does the Michelson interferometer work? In the interferometer shown, the lengths L_1 and L_2 are different. What is the path difference between the light waves that are sent along the two arms when they recombine at the screen?



3. Concerning the laser:
- The coherence is a characteristic length of the wave trains emitted by the laser. Physically, what does this length tell us about the light from the laser? Why is this an important number to know? How might you measure it?
 - The laser light is very bright or intense, with a power of 45 mW in a collimated beam. Compare this to the power of the sun at the earth's surface (check the CRC Handbook. The solar constant is 2 calories/cm²/minute). How do the spectral powers compare (power/wavelength interval)?
4. What are the safety requirements for working with this Laser?

Staff Signature _____ Date _____

Completed on the *first* day of lab? (circle) Yes / No

Mid-Lab Questions

On day 3 of this lab, you should have measured the stability of the laser and successfully produced a transmission hologram. Show them to an instructor and ask for a signature.

Staff Signature _____ Date _____

Completed on the *third* day of lab? (circle) Yes / No

INCLUDE THESE SHEETS AS THE FIRST PAGES OF YOUR REPORT

Physics 111 Advanced Lab

Student Evaluation of Experiment

Now that you have completed this experiment, we would appreciate your comments. Please take a few moments to answer the questions below and feel free to add any other comments. Since you have just finished the experiment it is *your* critique that will be the most helpful. Your thoughts and suggestions will help to change the lab and improve the experiments.

Please be as specific as possible, using both sides of the paper as needed, and turn this in with your report. Thank you!

Experiment Name: _____ Date: _____

How was the write-up for this experiment? How could it be improved?

How easily did you get started with the experiment? What sources of information were most/least helpful in getting started? Were the reprints appropriate? Did the pre-lab discussion help? Did you need to go outside the course materials for assistance? What additional materials could you have used?

What did you like and/or dislike about the experiment?

Would you recommend this lab to a fellow student? Why or why not?

What advice would you give to a friend just starting this experiment?

If the course materials were available over the Internet (WWW, FTP, etc.), would you (a) have access to them and (b) would you prefer to get them this way?

Please circle the abbreviations of the other labs you have done.	Overall quality of this experiment?				
ATM BMC BRA COM CO2 GMA HAL	1	2	3	4	5
HOL JOS LIF LLS MNO MOT MUO	Poor		Average		Good
NLD NMR OPT OTZ RUT SHE XRA					