

493L: LABORATORY SAFETY
Department of Physics and Astronomy
University of New Mexico

Elements of this laboratory class pose certain hazards. No instructions can substitute for common sense. If you are unclear about something ask the instructor or the TA. Safety topics include: Machine Shop Safety, Laser Safety, High Voltage Safety, and Radiation Safety. Safety rules and guidelines are designed to reduce the possibility of accidents in routine situations. In a research laboratory where much equipment is custom made there is no routine, and there is no safety rule or policy that can substitute for an intelligent and careful handling of the equipment. The following notes are intended to make you aware of the risks of working in the Senior and Optics Laboratories.

Machine Shop Safety.

Some basic directions are given in the lab write up. Duplicate and additional items are listed below.

- Never work alone in the shop.
- Safety glasses must be worn in the shop at all times.
- Do not enter the shop with bare feet, sandals, slippers, or open toed shoes.
- Tie back long hair.
- Do not wear loose clothing or jewelry.
- Maintain a clean work area.
- Do not touch chips while the machine is operating.
- Do not leave chuck keys in chucks.
- Secure all work (clamp in vice, chuck, etc.).

Laser Safety

For a complete introduction to laser safety see:

<http://www.osha.gov/SLTC/laserhazards/>The American National Standard Institute (ANSI) has classified lasers according to what they perceive as hazard level. Class IIIb and class IV lasers are considered as hazardous. The HeNe lasers used in the experiments you will be doing typically will not cause permanent eye damage, however, it is good practice to: 1) Never look directly at the beam of the laser, 2. Keep the laser beam in one horizontal plane close to the table, 3) Never bend down to the table level. We have purposely chosen to have the optical table surfaces as low as possible which reduces the chances of having your eyes at the beam height. Low chairs are not allowed in the lab. Sitting accommodations are limited to high stools.

High Voltage (&Line Voltage) Safety

You can supplement the following general electrical safety description with reading at:

<http://www.osha.gov/SLTC/electrical/index.html>The following guidelines are to protect you from potentially deadly electrical shock hazards as well as the equipment from accidental damage. Note that the danger to you is not only in your body providing a conducting path, particularly through your heart. Any

iii
involuntary muscle contractions caused by a shock, while perhaps harmless in themselves, may cause collateral damage due to contact with sharp edges and points inside various things like stamped sheet metal shields and the cut ends of component leads. In addition, the reflex may result in contact with other electrically live parts.

- Don't work alone because in the event of an emergency another person's presence may be essential.
- Always keep one hand in your pocket when near a line-powered or high voltage

system.

Radiation Safety

For a complete introduction to radiation safety see:

<http://www.osha.gov/SLTC/radiation/> It is possible that several types of radioactive source will be encountered in the

laboratory. Most of the sources you will use in this laboratory are sealed. Low activity sources and therefore present no health issues.

NEVER eat, drink, or smoke in the laboratory. Wash your hands at the conclusion of each laboratory session. Sealed gamma ray sources having activities of $\sim 1 \mu\text{Ci}$ can be handled with your fingers. For sealed and unsealed source of roughly $10 \mu\text{Ci}$ or greater use tongs or other devices. Do not handle directly.

Certification: return this signed statement to the instructor:

I have read and understood the document on laboratory safety for physics 493L and agree to follow these rules when in the laboratory.

Your Name: _____

Date: _____