

Safety in the Ultrafast Photonics Laboratory (UPL)

I. Emergency Procedures

1. For any medical emergency, fire, chemical spill, or other urgent situation, call 5-5555 from a campus phone or 911 from a mobile phone. Do not hang up until the emergency responders have cleared you to do so.
2. Remove yourself and others from the hazards if you can do so without putting yourself at risk.
3. In the case of chemical exposure to the eyes, flush eyes at eyewash stations located in the lab vestibule or near the lab entrance for at least 15 minutes and seek medical attention.
4. In case of skin contact with hazardous chemicals, remove contaminated clothing immediately, flush thoroughly with water using the chemical shower, and seek medical attention.
5. Once the immediate danger has been removed, call Dr. Kuis or Dr. Johnson at 443-851-1465 or 732-216-5635.
6. For assistance in cleaning up a chemical spill, call ESH at X52918.

II. General Guidelines

1. Only do work that you are confident you can perform without hurting yourself, others or damaging the lab equipment. If you aren't sure whether you can do something safely, don't do it.
2. Let me know as soon as possible about any near misses, chemical exposures, damage to lab equipment, or safety concerns.
3. Authorized work
 1. The only people working in the lab should be group members or other people authorized by Dr. Johnson.
 2. Make sure the lab door is locked when you leave. Make sure that the doors entering the CASPR area, lab vestibule and lab are always locked and make sure they are locked when you leave for the day.
 3. Discuss any hazardous work with Dr. Johnson before starting.
 4. Before starting work, let us know about any conditions that could affect safe work in the lab, such as a disability, chronic illness, or possible pregnancy.
 5. Avoid working alone in the lab if possible. High-hazard work should be done only if somebody else is in the lab.
 6. When you are working late or on the weekend, let somebody know where you are.
4. Working together
 1. When somebody else is working in the lab at the same time as you, be aware of any hazards involved in their work.

2. Keep the lab tidy and uncluttered.
3. Dispose of and replace any damaged glassware or other lab equipment.
4. Replace any supplies that are nearly used up.
5. Electrical safety
 1. Do not overload circuits.
 2. Minimize the use of extension cords.
 3. Do not daisy-chain power strips.
 4. Electrical work should only be performed by trained personnel.
 5. No work should ever be done on energized equipment.
6. Compressed-gas cylinders must be properly secured, equipped with an appropriate regulator, and used only by trained personnel.
7. Cryogenics must be used only by trained personnel wearing appropriate personal protective equipment.

III. Laser Safety

1. When lasers are activated, the laser warning light must be turned on, the lab door must be closed, and work areas must be separated by curtains.
2. Laser beams
 1. Know where all laser beams are going, including stray reflections.
 2. All beams must end on a detector, beam stop, or other appropriate termination.
 3. Laser beams should never leave the optical table.
 4. Avoid vertical beams and beams close to eye level.
3. Personal protection
 1. Wear laser goggles whenever aligning beams. Make sure the goggles you wear are appropriate for the wavelengths and powers involved.
 2. Remove shiny watches, jewelry, etc. before working with laser beams.
 3. Secure long hair, chains, loose clothing, or anything else that could get in the laser beam.
 4. Avoid lowering your head to the level of the optical table.
4. Alignment
 1. When aligning, use the lowest reasonable laser power. A separate alignment laser is preferred, if possible.
 2. When possible, use viewers to image infrared beams. Beware of reflections off viewing cards.
5. Use a camera instead of eyepieces for viewing in a microscope when laser beams are involved.

IV. Chemical Safety

1. Before beginning work with chemicals, know the location and operation of the eyewash station and chemical shower.
2. Fume hood
 1. Hazardous chemicals must be handled only in the fume hood.
 2. Outside of the fume hood, hazardous chemicals are allowed only in closed containers.
 3. Keep the fume hood closed when not in use.
3. Personal protective equipment
 1. Gloves are always required when working with chemicals.
 2. Make sure the gloves you wear are suitable for the type of chemical you are handling.
 3. Safety glasses are required whenever working with chemicals.
 4. Splash goggles are required when working with acids and other corrosives.
 5. Lab coats are recommended whenever working with chemicals and are required when working with hazardous chemicals.
 6. Closed-toed shoes are required when working with chemicals.
 7. Bare legs are not allowed when working when chemicals (no shorts or skirts).
8. Secure any long hair, loose clothing, chains, etc.
9. Do not wear chemical gloves or lab coats outside of the lab.
10. Remove and dispose of any contaminated gloves, lab coats, etc.
4. Chemical hazards
 1. Familiarize yourself with the hazards of the chemicals you are using.
 2. Read the safety data sheets and add to the folder the safety data sheet of any new chemical brought into the lab.
 3. If safety information is not available, assume the chemical is hazardous.
 4. Work with lower-hazard and greener chemicals whenever possible.
5. Chemical storage
 1. Label all chemical containers, including containers currently in use for an ongoing experiment.
 2. Labels must include the English name of the chemical, your name, and your phone number.
 3. Flammable chemicals and acids must be stored separately in the appropriate cabinets under the fume hood.
 4. Do not store incompatible chemicals together.
 5. Avoid storing chemicals in the fume hood.
6. Hazardous waste must be disposed of in appropriate containers.
 1. Liquid waste should be stored in a labeled bottle, stored in or under the fume hood. Complete the log sheet when adding waste to the container. Do not add incompatible chemicals to the same waste container.
 2. Sharps should be stored in the appropriate container in the fume hood.
 3. Solid waste should be stored in labeled, sealable plastic bags in or under the fume hood.

4. Arrange for disposal before hazardous waste containers are nearly full.
5. Never dispose of any waste chemicals down the drain.
7. Avoid mixing incompatible chemicals, or creating any mixtures that will lead to production of high heat, hazardous vapors, rapid bubbling, etc. Always add acid to water.

H. Work with hydrofluoric acid or other chemicals presenting special hazards is allowed only with appropriate training.