

DEPARTMENT OF PHYSICS

SAFETY AND EMERGENCY PROCEDURES MANUAL

INTRODUCTION

This manual has been prepared as a guide to the personnel of the Department of Physics, University of California, Davis. Its purpose is to provide information to all faculty, staff, students, and guests of the department on matters with which they may need assistance.

Our intent is to update the booklet as needed when policies and procedures change. This manual is not intended to replace campus policies and/or guidelines that cover specific areas and procedures in detail.

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I. ADMINISTRATIVE ORGANIZATION

Department of Physics, 530 752-1500

Shirley Chiang	Department Chairperson	2-5989
Lori Lubin	Vice Chairperson – Administration & Undergraduate Program	4-4418
Steven Carlip	Vice Chairperson – Graduate Program	2-8786

Administrative Personnel

Balics, Anneke	Administrative Assistant	2-1818
Borghi, Elizabeth	Contracts and Grants Assistant	4-7648
Brooks, Tracey	Business Office Manager	2-6830
Feldman, Bryn	Sr Editor with Prof Tyson	
Do, Kristina	Financial Assistant	4-8719
Lade, Tracy	Department Manager	2-4087
	Academic Personnel Coordinator	2-4086
Peterson, Laura	Graduate Program Coordinator	2-1501
Tolle, Georgie	Undergrad Academic Advisor	2-4092
Kilpatrick, Kari	Administrative Assistant	2-1500
Tuck, William	Administrative Assistant	2-4088
Yan, Onelia	Financial Assistant	2-6742

Technical Personnel

Case, Michael	Software Engineer	4-7226
Barnett, Brian	Teaching Laboratory Support	2-0679
Uvarov, Sergey	Laboratory Assistant, Teaching Labs	2-0679
Hannon, Michael	Computing Support Unit Manager	2-4966
Hemer, David	Machinist	2-1796
Holbrook, Britt	Electronics Shop Manager	2-8286
Rumiansev, Georgi	Sr. Electronics Technician	2-1795
Smith, Matthew	Lecture Support and Safety	2-2223
Thomson, John	Machine Shop Manager	2-1796
Wang, Dar-Yih	Programmer	2-4923
Cheung, Henry	Programmer	2-4923

II. GENERAL SAFETY RULES

If you are having trouble evaluating the seriousness of an incident, call Peter Klavins at 752-6743 or Brian Barnett at 752-0679.

1. All personnel should learn the location and operation procedures of the nearest eye-wash fountain, safety shower, fire extinguisher, and fire alarm box.

First aid for acid or base in the eyes is to wash with copious amounts of water for 15 minutes, and then go immediately to the Student Health Center (students) or Employee Health Services (faculty, staff) for further treatment.

First aid for acid or base on skin or clothing is to wash thoroughly with water, and then go immediately to the Student Health Center (students) or Employee Health Services (faculty, staff) for further treatment. After hours, seek medical attention at Sutter Davis Hospital.

2. All accidents, injuries, explosions, or fires must be reported to the Department Manager as soon as possible.
3. Shoes must be worn at all times.
4. Laboratory areas where hazardous materials are used must never be used for eating or drinking.
5. Smoking is not permitted in the buildings or within 20 feet of a door or open window to the building.
6. All operations in which noxious or poisonous gases are used or produced must be carried out in a fume hood.
7. All toxic and/or flammable waste must be put into the appropriate waste container(s) provided in your laboratory. The containers must be labeled, dated, and kept covered at all times. For details for hazardous waste disposal, see Section VI. Waste may be held for a maximum of nine months; less time for some chemicals. Violations are subject to fines.

III. EMERGENCY PROCEDURES

3.1 GENERAL INSTRUCTIONS - CHEMICAL SPILL

1. Get everyone out of the laboratory immediately.
2. Close all doors and windows. Do not lock them.
3. Alert personnel in the vicinity of the spilled material and direct vacating the area if hazardous conditions exist.
4. Call the Fire Department, 911, or 530 752-1230 from cell phone (give building, room number, and request an ambulance if any injury has occurred).
5. Communicate - What the chemical is; Where it is; How much; and Likelihood of injury. Also inform the principal investigator and the Chair's office that an accident has occurred.
6. Stand guard until the Fire Department arrives. The Fire Department has protective apparatus and clothing to aid in disposing of hazardous materials.
7. Call Environmental Health and Safety (2-1493) and give the details of the accident.

3.2 PERSONAL INJURY - FIRST AID

Call **911 or 530 752-1230 from cell phone** to obtain emergency medical assistance in any case of serious injury or life-threatening illness. If you are uncertain about the seriousness of an injury, call **911 or 530 752-1230 from cell phone**.

Do not move a seriously injured person who is not in immediate danger from fire or other hazard, as moving an injured person can cause additional injuries.

Emergency response by ambulance and fire personnel on the Davis campus will be rapid. If an accident victim requires emergency first aid to save their life and you have received first-aid training, you should perform the procedures you believe are necessary. These life-saving procedures might include stopping profuse bleeding, Cardiopulmonary Resuscitation (CPR), or the Heimlich maneuver for a choking victim. Do not attempt to make the patient "more comfortable" or perform other unnecessary maneuvers that could result in additional injuries.

Minor injuries may be treated with your first-aid kit before sending the victim to the Cowell Student Health Center or Employee Health Services, but all injuries must be reported to your supervisor.

3.3 FIRE

1. Alert the University Fire Department by pulling the fire alarm or calling **911 or 530 752-1230 from cell phone**, and calmly and clearly state:
 - ** the location of the fire
 - ** the extent of the fire
 - ** special circumstances for hazards, such as chemicals, valuable equipment, etc.

Pull boxes are located near most main building exits. An alarm may not sound in the building, but the Fire Department will be notified. All fires must be reported to the Fire Department as soon as they are discovered. The Fire Department will make the decision to evacuate the building.

2. If the fire occurs in any area where radiation, chemicals, or other hazardous substances or operations exist, advise the Fire Department personnel of the exact location and nature of the hazard. Fire Department personnel will notify EH&S or emergency clean-up contractors.

For very small fires, lab personnel should extinguish the fire using a fire extinguisher or by covering the container of flammable material, as appropriate. Good judgment is critical. If the fire cannot be controlled by laboratory staff, time lost attempting to fight it could be disastrous. It is important to consider the size of the blaze, the type of material burning, other fuels in the vicinity, and the number of people in the lab.

If you are fighting a fire and find that it is becoming larger rather than smaller, you should stop fighting it and evacuate the laboratory. You must in any case be conscious of the probability of toxic fumes, reduced oxygen supply in the room, explosion of the material burning, or of other adjacent materials. It is critical that lab personnel not overestimate their ability to fight large or growing fires.

In case of large fires or fires involving toxic or potentially explosive materials, it is imperative that others in the vicinity be warned. Knocking on doors of nearby labs may be appropriate for an initial warning. The Chair's office should be called to initiate a building-wide evacuation if this is determined to be necessary. The Fire Department will determine the need for larger area evacuations. Area safety liaisons have whistles to aid in emergency communication.

For all fires, notify the principal investigator and the Chair's office as soon as practical after calling the Fire Department

Fire Alarm Procedures for Evacuation – See Building Evacuation Protocol, Section IV.

3.4 **CHEMICAL SPILLS**

For small spills (less than 1 pint), use the spill cleanup materials available in the lab to absorb and/or neutralize the spill. Wear your assigned personal protective equipment! Be sure to restock materials used and clean and put back reusable equipment.

Spills involving larger quantities or particularly hazardous materials must be reported immediately (**911 or 530 752-1230 from cell phone**). If the spill presents an immediate risk to the health of the lab personnel, they must be evacuated and the room doors closed. Do not attempt to clean up spills that create hazards for which your protective equipment was not designed. Half-face respirators, for example, are not adequate for high concentrations of toxic vapors and do not protect the eyes from corrosive atmospheres.

Spills that require specialized cleanup or monitoring equipment should be performed by personnel from the UC Davis Fire Department. A common example is mercury spills. Although cleanup is fairly straightforward, it is often difficult to be certain that all the mercury has been removed without fairly expensive monitoring equipment that the lab is unlikely to own. The Fire Department has the equipment and experience to help make your cleanup easier and more effective.

In all spill cases, notify the principal investigator and the Chair's office as soon as possible. For further information on chemical spills, see **Safety Net #13 "Guidelines for Chemical Spill Control,"** in Appendix C, and on the EH&S website.

3.5 **EARTHQUAKE**

In a severe earthquake you will find standing or walking to be almost impossible. The best you can usually do is to crawl under a nearby desk to protect yourself from falling objects and flying glass. If you are near an open doorway, crawling under it may provide some protection in case the ceiling collapses.

Earthquake safety requires that precautions be taken before the earthquake occurs to minimize the potential for damage or injury. It is critical that chemical containers be stored in ways that will prevent them from falling to the floor during the earthquake. Bars or rods on shelves and latchable doors on cabinets will provide protection. (Swinging cabinet doors that do not have positive latches **WILL** open during an earthquake.) Large containers of hazardous liquids such as gallon-sized bottles of flammables or acids should be segregated from incompatible chemicals and stored on the lowest shelves. Less hazardous, dry chemicals in small bottles can be stored on higher shelves. If the contents of alphabetically sorted chemical containers are deposited in a mass on the laboratory floor, very dangerous chemical reactions may occur. Compressed gas cylinders should have caps on when not in use and have approved double strapping or chains at all times. An earthquake in an unprepared lab could be a very serious disaster for the occupants.

After the tremors have stopped, you should get out of the lab if possible. Be very aware of equipment stored or mounted overhead that could fall on you in case of an after-shock. It is unlikely that emergency personnel will be able to respond to your lab for some time after the earthquake. Initial efforts will be concentrated on saving lives rather than property, and you should be prepared to perform first aid and otherwise assist those who have been injured.

Leaving a building during an earthquake can be very dangerous, as there are many architectural components of the building that could fall during the shaking. If possible, find and take your lab's flashlight or other emergency light. Falling window glass can be a particularly serious hazard. Do not attempt to leave the building until you are sure that the shaking has completely stopped. Once outside, move away from building and other overhead hazards (power lines, light poles). If a building containing hazardous chemicals is burning or there is a release of toxic materials, move well away from the building by walking into the wind. If the wind direction changes, you may have to move to a new location.

3.6 BOMB THREAT

If you receive a threatening call or a bomb threat on your telephone, please follow the procedure as outlined in Appendix B.

IV. BUILDING EVACUATION PROTOCOL

4.1 INTRODUCTION

An evacuation is defined as the emptying of an occupied area and the transference of occupants to a safe location. The need to evacuate may be caused by any hazard -- natural, technological or human -- that threatens the UC Davis campus.

The Building Evacuation Protocol is the first part of a department's Emergency Action Plan. The department's Building Evacuation Protocol also links with the UC Davis Campus Emergency Operations Plan (EOP). The campus EOP coordinates the safe evacuation of students, staff, and faculty from building assembly areas to zone assembly areas and, if necessary, to a mass care facility. For more details, refer to Appendix F in the campus EOP.

The Physics Department Building Evacuation Protocol complies with the California, Code of Regulations, Title 8, Section 3220; the California Education Code, Parts 40 & 59 - Chapter C4.1, Section 66210 and Chapter 6, Section 94600; Title 19, Sections 3.09 & 3.13; and UC Davis Policy and Procedure 290-05.

4.2 DEPARTMENT INFORMATION

Department Locations: Physics/Geology Building, Roessler Hall, Walker Annex, Everson Hall

Department Safety Coordinator: Peter Klavins

Phone Number: (530) 752-6743

E-mail Address: klavins@physics.ucdavis.edu

Alternate Safety Coordinator: Brian Barnett

Phone Number: (530) 752-0679

E-mail Address: barnett@physics.ucdavis.edu

Department FAX Number: (530) 752-4717

Date of Annual Review of Department Action Plan: January

Date of Annual Evacuation Drill: As needed

4.3 EMERGENCY EVACUATION PROTOCOL

Warnings and Alarms

Three types of warnings are used by the campus to notify personnel to evacuate a building: (1) verbal warning, either in person or loudspeaker; (2) fire alarm, horns, and flashing lights; and/or (3) the campus radio station KDVS 90.3 FM.

Department Safety Coordinator Duties: To the extent it is possible and safe for you, check all rooms and direct everyone to evacuate.

Prior to Exiting

After hearing the alarm to evacuate, stop all work activities. If time permits, each person will gather their valuables (i.e., car keys), turn off their CPU/printer/monitor, shut down experimental equipment, lock away sensitive items, leave the lights on, and close, but do not lock the doors (locked doors can hamper rescue operations).

The person responsible for roll call will take the personnel list before leaving the building.

Evacuation Routes

Emergency evacuation routes are posted by each stairwell in the Physics/Geology building and Roessler Hall. The map shows the primary route evacuees will take to exit the building. Walk, do not run, to the emergency exit.

Department Safety Coordinator Duties: Help direct those exiting rooms, floors, or the building by posting yourself at strategic locations along the evacuation route. Recruit volunteers to help you direct evacuees to the building assembly area.

Building Assembly Area

The safety coordinator or alternate will work closely with faculty and administration to determine if individuals are still in the building. After exiting the building, employees, students, and visitors will follow the evacuation route to the pre-arranged building assembly area (refer to the evacuation route map). The supervisor is responsible for assisting with roll call and reporting injuries to the department safety coordinator. The department safety coordinator is responsible for informing the on-scene incident commander of the status of employees. If an employee is in immediate danger, report the location of the person directly to the nearest emergency responder.

Stay within your respective group at the building assembly area. Do not leave the area.

During inclement weather, evacuees will be directed to an alternate building assembly area.

The building assembly area for employees in the Physics Department is on the lawn directly north of the Physics/Geology building.

Department Safety Coordinator Duties: Once in the assembly area, take roll call or arrange for the responsible individuals to conduct roll call. The purpose of roll call is to help report injuries or trapped persons to the on-scene incident commander. Recruit volunteers and post them near all entrances to the building. Instruct the volunteers to advise anyone against re-entering the building. Report injuries to the on-scene incident commander.

Zone Assembly Area

The Zone Assembly area is to be determined at a later date.

Building Coordinator

The Building Coordinator will be determined at a later date.

Persons With Mobility Impairment

The following guidelines will assist differently abled employees with emergency evacuation from the Physics Department.

Visually Impaired:

1. Describe the nature of the emergency to the person.
2. Offer to guide the person and ask if he/she prefers to take your elbow.
3. Advise the person about the evacuation route.
4. Take the person to the building assembly area.

Hearing Impaired:

1. Never assume a hearing impaired person can lip read.
2. If the person did not hear the warning or alarm, write down the type of emergency and direct them to the emergency exit.
3. Offer to walk with the person to the exit.
4. Take the person to the building assembly area.

Persons using Crutches, Canes, or Walkers:

1. Describe the nature of the emergency.
2. Offer to guide the person and ask if he/she prefers to take your elbow.
3. Advise the person about the evacuation route.
4. Take the person to the building assembly area.

Persons using Wheelchairs:

1. Describe the nature of the emergency.
2. Ask the person how you can help him/her to exit the building.
3. Always follow the instructions of the wheelchair user.
4. Do not remove a person from a wheelchair unless they agree to such a procedure.
5. Some electric wheelchairs can weight 400 pounds. If needed, use a minimum of four injury-free employees with strong backs to move the chair without the battery. Follow correct lifting techniques.
6. Take extra care for wheelchair users attached to a respirator. Detach and test the portable respirator unit prior to disconnecting the battery operated respirator.

Unconscious Person in a Wheelchair:

1. Call 911 or 530 752-1230 from cell phone.
2. Give your name, department, and phone number.
3. Describe the situation and where you will meet emergency personnel.
4. If you are unable to meet emergency personnel outside, ask someone in your unit to escort emergency personnel to your location.
5. If immediate evacuation is required, do what is required to exit safely.
6. Follow all instructions from the emergency dispatcher.

Department Safety Coordinator Duties: Speak with mobility impaired persons in your department on a one-to-one basis. Ask them if they need assistance, and if yes, how do they wish to be assisted. Recruit volunteers to assist people prior to an incident.

Classrooms and Teaching Laboratories

The building evacuation notice is posted in each room. The statement will instruct students to evacuate through the nearest exit, assemble outside for roll call, and wait for further instructions.

Department Safety Coordinator Duties: Posting the building evacuation notice in general assignment classrooms is the responsibility of the Building Safety Coordinator.

Responsibilities of the Safety Coordinator

1. Know the location of all fire extinguishers, pull alarms, and first aid kits. Be sure exit signs are posted and walkways remain clear at all times.
2. When an alarm has been sounded, to the extent that it is possible and safe, systematically check all areas to assure they have been evacuated.
3. Post helpers along the evacuation route to guide others to the building assembly area.
4. Assist differently abled persons to evacuate safely.
5. Work to keep employees calm and informed.
6. If ordered by the on-scene incident commander, move to the zone assembly area.
7. If ordered by the on-scene incident commander, inform personnel when it is safe to re-enter buildings. After a major earthquake, persons may not re-enter their building until cleared by a qualified building inspector.

V. RESEARCH FACILITIES SAFETY RULES AND EMERGENCY PROCEDURES

5.1 GENERAL RULES

1. General - The following list of regulations is intended to serve as a guideline for safety in the laboratory and should be read carefully by all personnel. In case questions arise regarding any matter of safety that is not covered in this list, contact the Peter Klavins at 752-6743 or the Office of Environmental Health and Safety at 2-1493 for further information.
2. Accident Reports - Accident reports must be filled out and submitted to the Department Manager for any cases of fire or injury.
3. Fires - All fires, whether still burning or already extinguished, should be reported to the Fire Department (**911 or 530 752-1230 from cell phone**). If a fire extinguisher is used, even for a short burst, immediately report the usage to the Fire Department (2-1236) so that the extinguisher may be refilled.
4. Injuries - Employees who sustain a work-related injury or illness should immediately notify their supervisor. If medical treatment is needed or requested, the supervisor should send the employee to the Employee Health Services for treatment and/or referral. Employees who wish to receive treatment outside the University must file the name of their personal physician with the Benefits & Risk Management office. Unless a specific request for outside treatment is already on file at the time of injury or illness, an employee must be treated by University-selected physicians for the first 30 days. Additional information regarding medical treatment of work-related injuries or illness is presented in the Policy and Procedures Manual, Section 370-20.
5. Safety Goggles - Safety goggles must always be worn in the machine shop and when carrying out or while watching someone else carry out any procedure which might result in eye damage if an accident occurs. Safety goggles must not be modified in any manner. If they are modified, they are no longer OSHA approved.
6. Smoking is forbidden at all times in all buildings.
7. Working Alone is not to be permitted when carrying out hazardous procedures or while working in the machine shop.
8. Bare Feet are not allowed in the laboratories or shops.
9. Eating is not allowed in areas where hazardous materials are being handled or stored.
10. Safety Equipment - Each person should know the proper location of and understand the proper operation of the fire extinguishers, safety showers, fire alarm boxes, etc., in and near his/her laboratory.
11. Waste Disposal - The improper handling of explosive, flammable, or toxic materials in a laboratory can result in hazardous conditions and fines. Proper procedures for disposal are outlined below.
 - a. Empty Glass and Metal Chemical Containers - All metal and glass containers must be emptied, rinsed out completely with water three times, have their caps removed, and be labeled "TRIPLE RINSED" before discarding in the laboratory waste cans or in the dumpster at the rear of the building. The custodians will refuse to handle any capped, unlabeled, or containers that are not empty.

- b. Chemicals and Reaction Residues – Chemical waste cannot be placed in the waste can, down the drains, or in the dumpster. If it becomes necessary to dispose of these types of materials, see the section on Waste Chemical Pick-up and Disposal Program for details.

5.2 SAFETY RULES

1. Safety Equipment - Access to fire extinguishers, safety showers, etc., should never be obstructed by furniture or equipment. If it is suspected that any of this equipment is not in proper functioning order, contact Peter Klavins at 752-6743.
2. Fume Hoods - These should be kept in good working order. The glass panels should never be removed from the hoods as this interferes greatly with their operating efficiency. If hoods are not operating correctly, let the principal investigator know immediately.
3. Labeling - All materials not stored in their original containers and all compounds prepared by any laboratory procedure should be clearly labeled. Labels should be of a type that are not easily removed or obscured in the course of normal handling. All hazardous waste must be labeled with an EH&S hazardous waste label. This label must be legible and complete.
4. Gas Cylinders - These are always to be held securely in place by a double chain with proper clamps away from any source of heat. Cylinders should always be stored and transported in an upright position. This is especially important in the case of acetylene. Also, they should never be moved without first removing the gauge and replacing the protective cap. Always check to make certain that gauges and valves are in proper working order, especially when using highly corrosive gases such as HCl. Small cylinders containing poisonous, corrosive, or highly flammable gases must be stored and used in a hood. Protective cap should always be in place when not in use.
5. Electrical Equipment - All electrical equipment, except "double insulated" electrical tools, should be equipped with three prong plugs. If three-way ground wire cords are attached in the wrong way, dangerous shock hazards may result. Safety interlocks must be installed on all high voltage equipment.
6. Refrigerators - Any material placed in refrigerators should be labeled as to the nature of the material, the **date**, and the **name of the owner** and kept in closed containers. No food or beverages should ever be placed in any laboratory refrigerator. Flammable chemicals are not to be placed in refrigerators that have not been approved for flammable storage.
7. Drying Ovens - Never place any equipment that is wet with organic solvents in drying ovens or use flammable solvent near them. They have open sparking contacts and explosions or fires could occur. Do not place plastic containers in drying ovens.
8. Vacuum and Pressure - Equipment being used under vacuum or pressure should always be handled with proper caution. Vacuum desiccators should be supplied with shields, and glass Dewar flasks must be wrapped with tape.
9. Hazardous Chemicals and Reactions - When working for the first time with chemicals or reactions whose hazards you are not acquainted with, consult with others who have used these materials before and with standard references such as "Merck Index." Always consult the material safety data sheet for each chemical. Always carry out reactions involving use of highly poisonous materials or flammable solvents in the fume hood. Also, do all reactions where there is any danger of reaction behind a safety shield.

10. Usage of Solvents - Highly flammable or toxic solvents should always be handled whenever possible in a hood or well ventilated area. Solvents in glass containers should not be kept on shelves above the level of the bench top or in places where they can be knocked over easily and broken.
11. Storage of Flammable Solvents
 - (a) You may store a total of 10 gallons of flammable solvents in each laboratory with the following limitations:
 - 1) Containers other than safety cans shall not be greater than 1 gallon.
 - 2) All containers must be properly labeled with factory label or equivalent information.
 - (b) You may store an additional 15 gallons in OSHA approved safety cans in each laboratory. Each safety can may not be larger than 5 gallons in size and must be properly labeled.
 - (c) If more than 25 gallons are to be stored in a single laboratory, you must use an OSHA approved storage cabinet.
 - 1) Quantities stored in OSHA approved storage cabinets may not exceed 50 gallons.
 - 2) Quantities stored in OSHA approved storage cabinets must either be in the original I.C.C. shipping containers or OSHA approved safety containers.
12. Acids and Bases - Care should be exercised when carrying large bottles of concentrated acids and bases. They should be stored in the laboratory in places where they will not be knocked over easily and broken. NOTE!! Special precautions are necessary when handling concentrated hydrofluoric and perchloric acids. Segregated secondary containment is strongly advised for liquid acids and bases.
13. Alkali Metals and Metal Hydrides - Extra precautions should always be taken when working with materials such as alkali metals, metal hydrides, aluminum alkyls, metal carbonyls, etc. Alkali metal, metal hydride and aluminum alkyl fires should be extinguished only with dry chemical extinguishers (not CO₂) or by smothering with sand or Na₂CO₃.
14. Mercury - Any mercury spillage must be cleaned up as soon as possible. For small spills, contact the department safety coordinator or EH&S. For larger spills, call 911 or 530 752-1230 from cell phone. In all cases of mercury spillage, notify the office of Environmental Health and Safety who will check the area and certify that it is mercury free. Apparatus containing large quantities of mercury should be provided with secondary containment for catching the mercury in case of breakage.
15. Radioactive Materials and Ionizing Radiation - Use of radioactive materials require special storage, handling, and disposal methods. Details pertaining to these and other points may be found in the Campus Radiation Safety Manual and the California State Code Section 12. X-ray equipment must be inspected and certified by EH&S.

5.3 LABORATORY FUME HOODS

The chemical fume hoods in our laboratories are designed to protect you from toxic and noxious vapors. They are the most important item of safety equipment in your laboratory. In order to gain the full protection these hoods provide, proper operating procedures should always be observed.

1. Call Physical Plant (2-1655) if you have any reason to suspect a fume hood is not operating properly. If a hood is deficient, the other hoods on the same system will be affected also.
2. Never change the position of the dampers that control the exhaust from your hood. Hood systems are very delicately balanced and adjusting the exhaust on one hood affects every other hood on the same system.
3. Be aware that very high face velocities will not make a hood safer. Velocities much above 150 ft. per minute cause turbulence at the face of the hood causing air from within the hood to contaminate the room. (Range is 100-150 fpm)
4. Do not block the ventilation slots at the back of the hood. This adversely affects the performance of the hood.
5. Set up your apparatus as close to the center of the hood's working surface as is practical. Try working 6 inches (15 cm) inside the hood.
6. Avoid putting your head inside the hood and stand a few inches back from the hood sashes when the experiment or reaction is in progress.
7. The horizontal sliding sashes in most of our fume hoods are intended to be used as safety shields. Do not remove sashes! This will affect the velocity drastically.

5.4 CRYOGENIC LIQUIDS

See Safety Net #58 in Appendix C and on the EH&S website.

5.5 LASER SAFETY

See abbreviated version of Safety Net #76 in Appendix C, complete version is on the EH&S website.

VI. WASTE CHEMICAL PICK-UP AND DISPOSAL PROGRAM

The Office of Environmental Health and Safety has an established, extensive waste chemical pick-up and disposal program (Policy and Procedures Manual, Section 290-65). Forms are in the red safety notebook in each lab along with the current price list.

DO NOT USE SINKS OR SEWER LINES FOR DISPOSAL OF ANY HAZARDOUS CHEMICAL WASTES

All waste chemicals such as organic solvents, flammable liquids, acids and other corrosive materials, highly toxic and poisonous materials, any pesticides, explosives and materials of an unknown and potentially hazardous nature are to be put in containers, capped, labeled, and dated. Please be sure to keep the flammable chemicals separate from the non-flammable chemicals. The Environmental Health and Safety Department can refuse to pick up improperly labeled waste chemicals.

REMEMBER, WASTE CHEMICALS ARE DANGEROUS, PARTICULARLY IN UNLABELED AND IMPROPERLY PACKAGED CONTAINERS.

1. DO NOT mix flammable and explosive waste materials with corrosive and poisonous wastes. Keep them stored and handled separately.
2. MAKE SURE all bottles, jars, or other containers of waste chemicals are properly sealed with caps and lids and have official EH&S hazardous waste labels stating the start date of accumulation, what the waste is, and which laboratory it came from. See Peter Klavins for information on storage time limits. Generally, it is nine months.

IF YOU HAVE ANY PROBLEMS THAT FALL INTO ANY OF THE CATEGORIES LISTED BELOW, CONTACT PETER KLAVINS AT 752-6743.

1. If you need to dispose of large quantities of waste chemicals such as acids in tanks or cleaning baths, drums of waste solvents, etc.
2. If you have any questions regarding special disposal problems or wish to discuss any aspect of the waste chemical program.
3. If you need help with questions concerning research protocols and chemical protocols from the safety perspective.

CALL 911 OR 530 752-1230 FROM CELL PHONE AND NOTIFY PETER KLAVINS to remove any materials which possess an *imminent* hazard to safety such as leaking gas cylinders, spilled mercury, peroxide forming ethers, shock sensitive compounds, etc.

VII. LABELING AND DISPOSAL OF RADIOACTIVE MATERIAL

Special areas and restrictions apply to radioactive material disposal. Solid and liquid waste must be treated differently and each radionuclide has its own special requirements. All waste must be labeled properly and packaged in accordance with EH&S regulations for the specific material.

Special Disposal Problems - Other materials such as asbestos, biological or carcinogenic material have specific guidelines. Call EH&S for further information and to obtain waste containers for these materials.

Scheduled Waste Pick-up - Containers should be placed in the laboratory near the corridor door or in a location made known to the person(s) who make the pick up. Full and partially filled containers will be picked up as scheduled and replaced with empty containers. Call EH&S at 2-1493.

Special questions concerning disposal, storage, and handling of radioactive materials should be addressed to Peter Klavins (752-6743).

VIII. KEY POLICY

Keys issued to department personnel are for their own personal use. We would like to keep rules to a minimum. However, the following must be observed if we are to maintain our present system.

1. Do not **loan** your key to anyone. If someone has forgotten their key, they may obtain another key from the Business Office.
2. In those hours when the use of a key is necessary to enter the building, do not leave doors ajar so that others may enter. If you notice outside doors open at these times, please close them and see that they are locked.
3. Doors to offices and laboratories should be locked from 6 p.m. to 8 a.m. and on weekends.
4. **Please remind personnel leaving the department to turn in their keys to the Business Office.** This is especially important for graduate students, undergraduate researchers, postdocs, and visiting scholars. Persons leaving during other than normal working hours are encouraged to leave keys with someone else in their group to be turned in. If you forgot to turn in keys, please mail them to the Physics Department.
5. Key check out to research groups and instrument rooms requires written approval from the faculty research director.

Violations of the above rules will force us to recall keys from those violating these rules.

APPENDIX A

APPENDIX B

APPENDIX C