

JILA BASIC SAFETY GUIDE

A MESSAGE FROM THE JILA CHAIR . . .

The safety of our people is of the highest priority at JILA. However, the nature of the experimental work done at JILA brings with it hazards such as fire, explosions, lasers, chemical spills, or natural gas leaks. In this environment, there are some basic things about safety that you need to know, even if you are a theorist or administrator who never visits a lab.

We know everyone's time is short but this topic is important, and we have tried to keep this booklet on basic safety at JILA as short and relevant as possible.

If you plan to spend more than just a few minutes in any lab, you must also read the appropriate Lab Safety Modules and pass quizzes on them. Before taking either the electronics or shop classes, you must also pass the quiz on Machine Shop Safety.

I hope that you will join with me in working to keep JILA as safe as possible.



EMERGENCY PHONE NUMBERS

- **Call 911** for the emergency line to the University of Colorado (CU) Boulder Police Department.
- **Call 2-6666 from an on-campus phone or 303-492-6666 from a cell phone** for help from the CU Police *if instant response is not crucial* or if you cannot get through on 911.

JILA SAFETY CONTACTS

The JILA Safety Officer is Beth Kroger, JILA Chief of Operations (x2-5625, Room A233).

For building equipment problems, contact a JILA Building Proctor:

- Chris Purtell. 720-208-8754 JILA Room S205
- Dave Errickson. 303-492-2928, Room S195

For questions related to management of hazardous materials or wastes do not hesitate to contact Environmental Health and Safety (303-492-6025) or via e-mail to ehs@colorado.edu

For after-hours issues please contact the CU Facilities Service desk at 303-492-5522

University of Colorado resources for laboratory safety can be found online at the following link:
<http://ehs.colorado.edu/lab-support/>

JILA SAFETY WEBSITE: [HTTPS://JILA.COLORADO.EDU/MEMBERS/SAFETY/SAFETY-JILA](https://jila.colorado.edu/members/safety/safety-jila)

MEDICAL EMERGENCIES

CALL 911 IMMEDIATELY. (SEE SECTION ON WORKPLACE INJURY AND REPORTING REQUIREMENTS FOR JILA EMPLOYEES AND NIST STAFF.)

If you're certain emergency assistance is not necessary, call UCB Police at 2-6666 for backup, or go to an urgent care facility. Students (undergrad and graduate) can call Wardenburg Health Center (x2-5432) for non-emergency appointments.

When there are serious injuries or sudden illnesses that require immediate attention, an ambulance will take the injured person(s) to the nearest emergency room.

- In more serious cases, someone knowledgeable about the incident or known to the injured person(s) (i.e., a JILA faculty member or other member of the laboratory group) should go with the patient to the hospital. This person should provide encouragement for the injured person(s), facilitate the registration process, and advocate for prompt and effective treatment.
- The hospital may request information about medical insurance. Persons not employed by either CU or NIST must rely on their own medical insurance coverage or Workers' Compensation plans from their employer or their own personal plans and should follow the provisions of their personal health insurance policy or Workers' Compensation insurance with respect to their treatment (or follow-up care in case of an emergency).

SECURITY AT JILA

The JILA Building is unlocked during normal business hours. Lock your office door when you leave to protect your purse/wallet and small electronic items (laptops, cell phones, etc.) from theft. Consider securing your laptop, desktop, or monitor.

Make sure exterior doors are firmly latched after you enter/exit the building. If a door does not lock after hours, please contact CU Police to secure the door 2-6666 from an on-campus phone or 303-492-6666.

Don't lend out your keys or BuffOne Card for JILA access. If someone needs access, go through the proper channels to obtain keys (Kim Monteleone; x2-7796; Room A235) and/or BuffOne Card access (Randall Holliness x2-4020; Room S175).

OUTDOOR WARNING SIREN

This five-minute warning siren followed by voice message signals a general emergency or disaster for CU or Boulder County. The outdoor warning siren is part of a countywide system for announcing events such as floods, tornados, terrorist threats, and other dangerous situations as well as alerting those on campus to dangerous situations at the university.

CU-BOULDER CAMPUS ALERTS

CU-Boulder notifies members of the community of emergencies through campus alerts, but the system cannot work without everyone's active participation. Information about campus closures and other emergencies is available via

- Text messaging — Sign up at <http://www.colorado.edu/alerts/Web> — Visit www.colorado.edu or CUConnect for detailed information and updates.
- Hotline — Call the campus hotline at 303-492-INFO for recorded updates.
- E-Mail — Check your official university e-mail account for important safety messages.

CULTURE OF LABORATORY SAFETY:

JILA places the highest priority on safety and is committed to training, educating and working with all JILA scientists and staff to ensure personal safety. All JILAns are empowered to reinforce the JILA Safety culture by directly addressing or reporting instances when unsafe practices or procedures are observed. Reports may be made to any JILA Fellow or to the JILA Safety Officer. JILA's goal is to support and encourage collaborative work; ensuring JILA scientists use agreed-upon safety protocols and understand specific lab risks for the protection of all. In support of the JILA culture of safety JILA has instituted the following:

- **Lab Safety Proctor.** Each supervising JILA Fellow will designate at least one Lab Safety Proctor. Each Lab Safety Proctor should be someone who regularly works in a particular lab or has knowledge of a specific lab safety issue (i.e. chemical safety). Responsibilities include communicating safety information and training opportunities to those working in that lab; ensuring Written Safety Notices are posted on all Class 3b and Class 4 lasers, and ensuring chemicals, gas bottles and SAA are maintained safely. Lab Safety Proctors may also initiate suggestions and propose activities to continue to improve JILA's safety culture.
- **Annual Lab Safety Meetings.** JILA Fellows will convene their research group at least once annually for a general discussion on safety, to solicit any concerns related to safety, and to collaborate on possible ways to continue to reduce risks and/or strengthen the culture of safety. Notes from these meetings should be provided to the JILA Safety Officer in July of each year and kept in the Lab Safety Notebook. The notes should include a list of designated Lab Safety Proctors for the group.
- **Lab Safety Notebook.** The Lab Safety Notebook is intended to be a quick reference to specific safety issues and hazards within each JILA lab. It may also contain general safety information, if desired but is not mandatory. The Lab Safety Notebook should be co-located with the MSDS notebook required in each lab. The Lab Safety Notebook may also be digital, but the digital form will not replace a paper copy to be located in each lab. The Supervising Fellow and Lab Safety Proctor should ensure that the Lab Safety Notebook has at a minimum:
 - Written descriptions of the primary safety hazards in that laboratory. Examples of hazards to be considered (not a comprehensive list) include:
 - non-ionizing radiation (lasers),
 - chemicals,
 - high voltage electrical,
 - cryogenics, and
 - mechanical impact
 - Safety procedures followed to minimize the risk for each of those hazards
 - Notes from Annual Group Safety Meeting.
 - Power Up/Down instructions for sensitive equipment.
 - Emergency Phone numbers for emergency responders and for lab/JILA personnel/
 - Listing of CU safety resource.
 - Listing of JILA Safety equipment and location nearest the lab
 - The PI will ensure that all new people working in the lab carefully review the written hazard descriptions and safety procedures before beginning work in the laboratory. A log of all those who have read/reviewed the including name and date of review will be kept in the notebook.

JILA Safety Training

- Mandatory Safety Training
 - All JILA scientists, visitors, employees and students must review the [JILA Basic Safety Guide](#) and pass the [JILA Safety Quiz](#) when first coming to JILA.
 - All JILA scientists, visitors, employees and students performing any type of work in a laboratory must read the [JILA Lab Safety Modules](#) and pass the quizzes on the relevant modules when first coming to JILA.
 - All JILA scientists, visitors, employees and students performing any type of work in a JILA laboratory must attend one JILA Safety Seminar annually. JILA Safety Seminars are offered twice per year. Attendance is tracked and recorded. Scientists should provide written documentation to the JILA Safety Officer, signed by their PI, if this requirement cannot be met. In these instances, an alternative safety training will be provided as approved by the JILA Safety Advisors and JILA Safety Officer.
- Voluntary Safety Training
 - From time to time, JILA offers other safety training. You should take advantage of these training opportunities when they are offered.

JILA SAFETY CONCERNS

Not all JILAns work in labs, but there are still lab-related safety issues that affect all JILAns.

- **Transport of Chemicals.** Often chemicals must be transported within JILA. Chemicals should never be left unattended in non-laboratory areas. Open containers should not be transported in non-laboratory areas. Gas cylinders in transit should be capped and on a hand truck specifically designed for use with cylinders. Do not use an elevator with a dewar, but rather take the stairs or wait for the dewar to be removed.
- **Instrument Shops.** Do not enter the Shop without using the eye protection provided at the door. The work performed by the Instrument Shop creates many sharp, tiny metal fragments that can damage your eyes. Do not wear loose clothing that could get caught in machines as this can cause severe injury or death (think ties, loose hair, long pony tails, etc.) Do not attempt to operate machinery without appropriate training or if you are alone. A safety course for the Instrument Shop is offered three times a year at no cost.
- **Electronics Shops.** This shop uses high voltage. Know what you are touching or ask the Electronics Staff. Don't assume that an unplugged apparatus poses no risk.
- **Lasers.** Most JILA Labs contain lasers. JILA uses various lasers – there is no one goggle that can protect your eyes from all JILA lasers. Don't assume a laser isn't active because you can't see it. This isn't Star Trek – the human eye can't see most of our lasers even though they can inflict major damage to your eyes.
 - **Laser Warning Light.** All JILA Labs that have lasers will have a Laser Warning Light. Do not enter a lab with an activated laser warning light without appropriate eye protection.
 - **Written Laser Safety Notice for all laser labs.** The notice should be no more than one page and posted on/near all Class 4 lasers and all other lasers that could cause permanent eye damage more quickly than the human injury avoidance reaction (i.e. blinking, turning head, etc.). Specific consideration should be given to issues such as wavelengths. The human eye is most sensitive to green light, so green lasers produce an avoidance response at lower powers than other wavelengths. Near infrared lasers can be completely invisible and produce NO avoidance response. The “visibility” of lasers should be considered

in determining whether or not the avoidance response would protect people in the lab. The Safety Notes should at a minimum indicate:

- i. Strength of laser(s).
 - ii. Wavelength of laser(s).
 - iii. Type of goggles required.
- **Laser Safety Goggles.** All lab occupants of a lab will wear laser safety goggles, as indicated on the Laser Safety Notice, for all Class 4 lasers and all other lasers that could cause permanent eye damage more quickly than the human injury avoidance reaction (e.g. blinking, turning head, etc.) are operating but not safely contained. JILA places the highest priority on safety and is committed to training, educating and working with all JILA scientists to ensure personal safety. When a JILA scientist (including visitors) is observed without laser safety goggles JILA provides the following supports to reinforce the necessity of eye protection. All JILAnS are empowered to reinforce the JILA Safety culture by noting and reporting instances when eye protection is needed, but not being used, to the JILA Safety Officer. The goal of this policy is to work collaboratively to ensure necessary JILA scientists use agreed-upon safety protocols and understand specific lab risks for the protection of all.
 - i. First Observation – Scientist will be asked to remove themselves from the lab for at least one-half day to review and complete a Laser Safety Exam
 - ii. Second Observation – Scientist will work directly with the JILA Fellow responsible for the lab to discuss various safety protocols and to ensure questions are answered, etc.
 - iii. Third and additional Observations –Scientist will meet with Fellows Safety Board to discuss the situation specifically and JILA safety protocols to ensure the safety of JILA scientists. The Fellows Safety Board includes JILA Chair, JILA Associate Chair, JILA Safety Advisors, PI of scientist and JILA Safety Officer.
 - **Safety Stations.** There should always be clear and unobstructed access to the safety showers, eyewash stations, IED devices and fire extinguishers located throughout JILA.
 - **Exits.** Corridors should be clear (an occasional item temporarily located may be fine). All exits and stairwells should be free from any items at all times. Exit lights should be lit.
 - **Evacuation Alarms.** Take all alarms seriously and evacuate quickly and calmly. JILA has dangerous chemicals, high voltage electrical appliances and other dangers.
 - **Be AWARE and REPORT.** If something looks unsafe or out of place – report it to the JILA Safety Officer rather than assuming someone else will deal with the issue. Do your part by being aware of circumstances and reporting safety concerns.

The safety of all JILAnS rests with each JILAn!

JILA EVACUATION:

UPON HEARING THE EVACUATION ALARM (LOUD WHOOP FROM LOW TO HIGH EVERY FEW SECONDS), REMAIN CALM AND EVACUATE THE BUILDING IMMEDIATELY CLOSING ALL DOORS BEHIND YOU VIA THE SHORTEST AND SAFEST ROUTE AND MOVE TO THE EVACUATION MEETING POINT.

In case of fire, explosion, or suspected natural gas leak, activate the red pull-box, located at either end of each B-wing and X-wing laboratory floor, on each floor in the tower, and elsewhere in the building, and evacuate immediately. (Take note of the pull boxes near your work area).

In case of a dangerous chemical spill, activate a yellow pull-box, located at the ends of each B-wing floor, and evacuate immediately.

Safe Evacuation Tips:

- When evacuating the building, quickly take personal belongings (ID, keys, purse, cell phone, wallet) and dress appropriately for the weather.
- Do not take time to shut off appliances or electrical equipment.
- If there is fire or smoke, stay low to the floor and exit the building quickly.
- Use an alternative escape route to avoid smoke if possible.
- Don't open warm doors. Test doors with the back of your hand before opening them.
- Exercise extreme caution in exiting, avoiding fixtures, wires, and unstable structures.
- Be sure to know more than one way to exit each building.
- **DO NOT USE AN ELEVATOR.** The tower has two completely separated stairwells located on opposite sides of each level in the tower.
- **Move to the designated evacuation meeting point at least 100 feet away from JILA building.** (SW corner of Farrand Field, parking lot entry north of Environmental Design building or east end of Duane Physics Lawn). Remain at the designated meeting location and do not leave until you have checked in with someone in charge.

Once you have evacuated to the designated evacuation meeting point,

- **Call 911** from the nearest phone in a safe area. Be prepared to provide JILA's location, details of the emergency event (location, type of problem, etc.), any injured persons, whether there may be persons still inside the building, your name, your phone number, and where you will meet responders.
- Await emergency response personnel at a safe location, direct them to the scene and follow their instructions. Be prepared to answer their questions.

Do not re-enter the building for any reason until emergency personnel have advised you that it is safe to do so. If you suspect that someone is missing or trapped, contact the emergency personnel outside the building.

If you are trapped during an evacuation emergency:

- close doors between you and fire and stuff cracks around the doors to keep out smoke.
- signal/call for help from a safe window if building is stable or take refuge under a sturdy table or desk if items are falling from bookshelves/ceiling.
- **Call 911** and tell them exactly where you are.
- Stop, drop, and roll if your clothing catches fire.

OTHER SAFETY ISSUES

- **Contact lenses.** Serious injury to the cornea can occur when chemicals or vapors become trapped behind contacts. To avoid this problem use prescription goggles/safety glasses.
- **Earthquake.** If you feel the ground shaking, drop, cover, and hold on in a safe place such as under a sturdy desk or table. Wait for the shaking to subside and for falling objects to stabilize before evacuating. Be alert for secondary hazards following an earthquake such as fires, landslides, dam failures, or shortages of food and other resources.
- **High winds.** Boulder often has strong winds that can come up without warning. Please close your windows if you will be away from your office for even a short time.
- **Tornado.** Seek immediate shelter in an interior room or corridor on the lowest floor of the building. Avoid large open rooms, windows, doors, and outside walls.
- **Flood.** Call a Building Proctor: Chris Purtell at 720-208-8754 or Dave Errickson at 303-492-2928; be aware of electrical shock hazard
 - **If you discover a major water leak or flood,**
 - *Immediately* call Chris Purtell at 720-208-8754 or Dave Errickson at 303-492-2928, at 720-208-8754 to report it. After hours, or if you cannot reach Chris or Dave, call Facilities Management, 2-5522.
 - If it is safe to do so, turn off and unplug all electrical equipment in the path of spreading water.
 - Do not step in water as it may be in contact with electricity.
 - Do not unplug an electrical appliance that is in contact with water.
 - **If you discover a small, manageable flood,**
 - Use the JILA wet-vac (currently in B1B25).
 - Contact Chris Purtell at 720-208-8754 or Dave Errickson at 303-492-2928 for a supply of absorbent material for dealing with minor oil spills. This material is located in a large “trash” container on the sub-basement level of the B-wing, just outside the freight elevator door.

JILA SAFETY EQUIPMENT

JILA has general-purpose safety equipment in the laboratory wings and the tower. Scientists, students, and staff are urged to locate and know how to use this equipment. Any questions concerning the use of this equipment should be directed to Dave Errickson (S195, x2-2928).

- **Chemical safety showers** are located in the men's rooms in the basement, first and second floors of B-wing; in rooms B124 (via B128), B1B12, and B216; in the basement annex between S1B40 and S1B20 and also near X1B21.
- Portable **Automatic External Defibrillators** (AED) are located on the wall in the center of each of JILA's lab wing corridors as well as near the x-wing ramps on the lower two floors. These "heart start" devices are designed for use by the ordinary person if someone experiences sudden cardiac arrest. These units will talk you through their use.
- **Eye Protection** is required to be available, by Colorado law, to anyone working in a laboratory. Eye protection is defined as shatter-proof safety glasses or goggles. Eye protection is located near the entrance, workbench or at the lasers in all JILA labs. All lab occupants of a lab will wear laser safety goggles, as indicated on the Laser Safety Notice, for all Class 4 lasers and all other lasers that could cause permanent eye damage more quickly than the human injury avoidance reaction (e.g. blinking, turning head, etc.) are operating but not safely contained. JILA places the highest priority on safety and is committed to training, educating and working with all JILA scientists to ensure personal safety. When a JILA scientist (including visitors) is observed without laser safety goggles JILA provides the following supports to reinforce the necessity of eye protection. All JILAnS are empowered to reinforce the JILA Safety culture by noting and reporting instances when eye protection is needed, but not being used, to the JILA Safety Officer. The goal of this policy is to work collaboratively to ensure necessary JILA scientists use agreed-upon safety protocols and understand specific lab risks for the protection of all.
 - First Observation – Scientist will be asked to remove themselves from the lab for at least one-half day to review and complete a Laser Safety Exam
 - Second Observation – Scientist will work directly with the JILA Fellow responsible for the lab to discuss various safety protocols and to ensure questions are answered, etc.
 - Third and additional Observations –Scientist will meet with Fellows Safety Board to discuss the situation specifically and JILA safety protocols to ensure the safety of JILA scientists. The Fellows Safety Board includes JILA Chair, JILA Associate Chair, JILA Safety Advisors, PI of scientist and JILA Safety Officer.
- Pressurized **eye-wash fountains** are located in the halls near rooms X1B21, S1B20, B1B12, B1B38, X131, B117, B143, and B240, as well as inside room B135 (via B131). They are also installed over the utility sinks of some laboratories.
- **Fire extinguishers** are located in every lab near the entry as well as throughout the lab hallways. They are primarily for the use of police, fire fighters, and others who have received training in their use. They should only be used for small, well-contained fires.
- **First-aid kits** are found in all lab and shop areas, as well as in A225.
- **Fire blankets** are located in the hall by B137 and in B128A.

- **Oxygen level sensors** are installed in the X-wing service corridors and in the Clean Room so that an alarm will sound if the oxygen level falls or rises to dangerous levels. If an oxygen alarm is sounding, assume there is a present danger, evacuate the area and call for assistance. The alarm is connected to the CU alarm station and should elicit a prompt response.

WORKPLACE VIOLENCE

Incidents of workplace violence have occurred at a number of locations in recent years, and CU is not immune to this possibility. While the odds are small, it is prudent for JILA students, staff, faculty and visitors to be prepared for such an incident here. Although there are no safety guarantees during such an event, the CU Police Department has developed the following recommendations to prepare for dealing with workplace violence:

Be aware and be prepared

- Have the mindset that workplace violence will happen at JILA. Universities are inherently open environments; they are difficult to secure.
- Know what resources are available for persons who appear to be in need of psychological help. Is there someone showing signs of becoming an “injustice collector?” Recommend counseling services or consider calling the police for guidance.
- Counseling assistance for CU students is available at Counseling and Psychological Services. For more information, visit <http://www.colorado.edu/sacs/counseling/>
- Active shooters may be suicidal. They have nothing to lose by killing.
- Active shooting incidents create chaos. Despite the confusion, react with a simple plan that maximizes potential for safety. There may be more than one “right” answer in your response, and you may have to switch gears at any time.
- Know you will act and survive.

If an active shooting incident occurs near you, try to

- **Get out.** Get away from the shooting. Go away to a place of safety. **Call 911**, provide the location of the shooting, and give a description of the shooters, if possible.
- **Hide out.** If you cannot get away from the shooting, find a room in which you can hide. Lock the door and turn off the lights. Spread out in the room, silence your cell phones, and inventory potential weapons.
- **Take out.** You and others may find yourselves being accosted by the shooter. If this happens, quickly develop a plan to attack the shooter. Use items at your disposal for improvised weapons, throw items to distract the shooter, and consider a plan to tackle the shooter, take away the weapon, and hold shooter until police arrive.

Law Enforcement Response

Boulder County law enforcement agencies, including the CU Police Department, are trained to respond to active shooting incidents. Be mindful that police response will come as rapidly as possible, but in the first few minutes of a violent incident, you may have to rely on your own actions to assure your safety. Feel free to contact CU Police at x2-8168 for more information.

WORKPLACE INJURY AND REPORTING

University of Colorado Employees *(includes student employees working while injured)*

Employee's Injury Report Form must always be filled out at JILA within 24 hours of the incident whether or not the injured employee seeks or receives medical treatment. In the case of serious injury, no later than 4 working days after the incident Employee's Injury Report Forms are available for completion online at <https://www.cu.edu/risk/incident-procedure>

1. If completing the form online is not possible, forms can be obtained from Agnieszka Lynch in JILA A304 and Faxed to the Claims Manager at Risk Management at 303-860-5680.
2. Injured UCB employees should notify their supervisor or a responsible colleague.

Choices for non-emergency medical care for on-the-job injuries for CU employees.

Arbor Occupational Medicine:

1690 30th Street, Boulder. (303) 443-0496
290 Nickel Street, Broomfield. (303) 460-9339

Concentra:

3300 28th Street, Boulder. (303) 541-9090
50 East 84th Street, Suite B-14, Thornton (303) 287-7070
620 S Lemay Avenue, Fort Collins. (970) 221-5811

HealthOne:

9195 Grant St., Thornton. (303) 292-0034
12207 Pecos St., Westminster. (303) 650-0445

Workwell Occupational Medicine:

Burlington Medical Center, 205 S. Main St., Ste. C, Longmont. (303) 702-1612
1608 Topaz Drive, Loveland. (970) 593-0125
1600 Specht Point Road, Fort Collins. (970) 672-5100

Emergency Rooms – Call 911 or go to the emergency room. Make sure to identify yourself as a CU employee when visiting any medical facility. Follow-up with University Risk Management and an approved provider noted above the next business day.

Boulder Community Hospital – Broadway North Broadway & Balsam (303) 440-2273

Boulder Community Hospital -- Foothills Foothills Pkwy & Arapahoe (720) 854-7000

NIST Employees

NIST employees injured on the job must *always* contact the Department of Commerce (DoC) Health Unit (303) 497-3801 as soon as possible for instructions regarding follow-up care.

1. You must file Form CD 137 "Report of Accident/Illness" with the NIST Safety Office (MC 104.02, (303) 497-7389). The form is available from the NIST Safety Office or from Eyvon Petty in JILA Room A231.
2. An *Incident Report* form should also be filed with UCB Risk Management via FAX at (303) 492-1902.
3. Workers' Compensation forms must be filed within 72 hours for injuries requiring medical care.

NIST employees with injuries requiring immediate attention (in- and out-of-hours) should go directly to an urgent care facility.

Boulder Community Hospital – Broadway North Broadway & Balsam (303) 440-2273

Boulder Community Hospital -- Foothills Foothills Pkwy & Arapahoe (720) 854-7000