SCIPP Lab Safety Plan: Revised November 2020

The SCIPP lab safety documentation is composed of the UCSC Lab Safety Manual (LSM) and this SCIPP Lab Safety Plan.

The online UCSC Laboratory Safety Manual (LSM) provides information regarding protection from health hazards associated with the laboratory environment in accordance with applicable California Occupational Safety and Health Administration (Cal-OSHA) regulations, including the "Chemical Hygiene Plan" requirements specified in 8 CCR 5191. The LSM serves as a resource for identifying and evaluating the nature of potential laboratory hazards, as well as determining appropriate hazard controls. The information in this manual applies to all laboratories that use, store or handle potentially hazardous materials and all personnel who work in these facilities.

The online LSM is revised continuously throughout the year by EH&S staff and can be found at this link: https://ehs.ucsc.edu/lab-safety-manual/

The online LSM, in conjunction with the SCIPP Lab Safety Plan, replaces the printed Chemical Hygiene Plan (the former Appendix J of the IIPP "slug" binder).

The laboratory Injury & Illness Prevention Program is located in room 383 at the beginning of the "Slug" binder.

SCIPP Lab-Specific Information

SCIPP labs are multi-user/multi-project facilities. Potential hazards include:

- High voltage electronics
- Radioactive materials and sources
- Lasers
- Flammable chemicals
- Machine shop equipment, hand tools, and sharps
- Liquid nitrogen and nitrogen gas
- Soldering
- Lead

SCIPP Lab spaces and contacts include:

Clean spaces and Assembly rooms: Nat Sci II labs 358C, 365, 365A and 369: Vitaliy Fadeyev and Forest Martinez-McKinney
Electronics labs – Nat Sci II labs 377, 383 and 389: Michal Tarka
Machine shops – Nat Sci II rooms 361 and 387: Forest Martinez-McKinney
Particle Astrophysics labs – Nat Sci II labs 312, 314 and 316: David Williams
Neurophysics lab – Nat Sci II lab 320: Sasha Sher
Johnson lab – Nat Sci II lab 334: Robert Johnson
Detector Packaging Lab – Nat Sci II lab 336: Vitaliy Fadeyev

Lab Worker and Volunteer Responsibilities

Every laboratory worker or volunteer must complete the SCIPP Safety Orientation (including all items on the Training Checklist) and sign the "volunteer agreement" if needed prior to beginning work in the lab. Determining which Hazard-Specific Training will be required is done in consultation with your Principal Investigator/Supervisor.

Every lab worker or volunteer is to observe the following guidelines:

1. Know the safety rules and procedures that apply to the work being done and take appropriate safety precautions including using personal protective equipment.

2. Food and beverages are prohibited in SCIPP labs which are designated as "Radiation Use Areas." These rooms have a "Radiation Use Area" sign posted at each door and are currently rooms 383 and 377, but this could change as the room use changes. Do not consume or even bring food or beverages in any of the lab rooms designated as Radiation Use Areas.

3. SCIPP labs 358C, 365 and 369 are clean spaces and assembly rooms. Lab workers and volunteers must complete clean space training prior to entering theses spaces.

4. Wear long pants and closed-toe shoes at all times in SCIPP labs.

5. Confine long hair and loose clothing when working in the lab.

6. Clearly label all chemicals in the lab, including small squeeze bottles.

7. Follow accepted non-hazardous waste disposal procedures. Do not dispose of hazardous waste. Only trained personnel (Michal, Forest, and the AD) should dispose as required.

8. Do not daisy chain electrical cords.

9. Maintain a clutter-free work area. Clutter and garbage can be a safety hazard. Do not leave boxes and packing material on lab benches or on the lab floor.

10. Know the location of emergency equipment; know the emergency evacuation routes, and how to report an emergency.

11. Use lab equipment in a safe manner and only for its designated purpose.

12. Do not work alone in the lab unless approved by the Principal Investigator.

Principal Investigator Responsibilities

SCIPP Principal Investigators have direct responsibility for the safety of laboratory workers and volunteers under their direction.

Principal Investigator responsibilities include:

1. Implementing policies and procedures described in the online Lab Safety Manual.
2. Ensuring that lab workers and volunteers receive safety training prior to beginning work by:
    a. Informing the Assistant Director prior to a new worker or employee beginning in the lab.
    b. Identifying the required hazard-specific safety training for each new worker or volunteer.
    c. Informing the Lab Manager if an existing worker or volunteer will begin a new process or needs additional training.
    d. Inform the Assistant Director and Lab Manager when a volunteer or employee will no longer be working in the lab.
3. Ensuring that training requirements are fulfilled and that records are maintained by reviewing quarterly online training records (hard copy back-ups are stored in room 383) for all people under their direction.
4. Modeling safe lab practices including wearing long pants, closed-toe shoes, and using appropriate personal protective equipment.
5. Modeling safety best practices by completing all minimum training set for personnel under your supervision.
6. Seeking ways to improve lab safety at SCIPP.

Assistant Director Responsibilities

The SCIPP Assistant Director is responsible for co-managing the day-to-day safety operations of SCIPP facilities in collaboration with the Lab Manager and PIs.

Assistant Director responsibilities include:

1. Completing the annual EH&S Lab Hazard Assessments with the PI and Lab Manager.
2. Providing pre-training instructions and in-person safety training for all new research personnel, ensuring all items on the Checklist are covered.
3. Maintaining online training records in coordination with the Lab Manager and providing the hard copy back-ups for lab workers and volunteers to the Lab Manager.
4. Reviewing online training record with PIs and Lab Manager quarterly.

5. Completing and renewing as needed the required campus Hazardous Waste Disposal training.
6. Seeking ways to improve lab safety at SCIPP.
7. Annually reviewing this SCIPP Lab Safety Plan.

Lab Safety Manager Responsibilities

The SCIPP Lab Safety Manager Michal Tarka, is responsible for managing the day-to-day safety operations of SCIPP labs in collaboration with SCIPP PI's.

Lab Safety Manager responsibilities include:

1. Maintaining online training records and hard copy back-ups for lab workers and volunteers in coordination with the Assistant Director.
2. Providing hazard-specific safety training as required by the PI.
3. Conducting quarterly lab safety self-inspections, paying particularly close attention to electrical safety (e.g. proper use of extension cords and power strips, equipment in safe working condition).
4. Reviewing annual EH&S Lab Hazard Assessments with the Assistant Director
5. Monitoring safety compliance of lab workers and volunteers.
6. Identifying and proposing safety improvements.
7. Maintaining supplies of lab safety equipment including secondary containment tubs and sharps containers.
8. Maintaining supply of personal protective equipment (PPE) as required in the annual EH&S Lab Hazard Assessment, sufficient and appropriate for all lab personnel.
9. Completing and renewing as needed the required campus Hazardous Waste Disposal training.
10. Representing SCIPP at EH&S Lab Safety Representative meetings.
11. Coordinating the SCIPP Chemical Inventory, ensuring that all containers are in good condition and contents are not expired.

Radiation Safety Manager Responsibilities

The SCIPP Lab Safety Manager Michal Tarka, is responsible for managing the day-to-day radiation safety operations in all SCIPP labs in collaboration with PIs, administrative personnel, and authorized users in compliance with the campus Radiation Safety Manual.

1. Biennial updating of the SCIPP Radiation Use Authorization (RUA) Update Report, including updates to the inventory, authorized personnel list, Radiation Safety Laboratory Records binder in the lab and review of the corresponding SOPs to ensure updates reflect any changes in procedures.
2. Registering any new radiation-producing lab machines.

3. Participating in all EH&S Radiation Safety Audits and resolving any issues in a timely manner
4. Registering and training all personnel engaged in the use of radioactive materials or using radiation producing machines.
5. Tracking training to ensure that all personnel have completed all required initial training or a refresher within the last 12 months.
6. Monitoring safety compliance of lab workers and volunteers with all handling and storage procedures in the current SOP.
7. Ensuring lab workers clean their bench after experiments to minimize dust in the lab.
8. Identifying and proposing safety improvements.
9. Ensuring all SCIPP radiation shipping or receiving processes are followed.
10. Working with the Assistant Director, SCIPP Director, and campus RSO in the event of any radiation safety incident to provide timely information to personnel and resolution of the issue.

SCIPP Hazard-Specific Training – To be Determined by PI

All SCIPP personnel who enter the lab space(s) should be familiar with the safe handling of hazardous chemicals. In the event of a spill, please notify Michal Tarka, Forest Martinez-McKinney, or the Assistant Director immediately. Only those trained in proper Hazardous Waste Disposal should clean up and dispose of items.

SCIPP lab workers or employees who work with liquid nitrogen or other hazardous chemicals are expected to complete the online Laboratory Safety Fundamentals training and the SCIPP-specific liquid nitrogen training coordinated by Michal Tarka.

Only authorized SCIPP personnel with specific machine shop training are allowed to enter the machine shop without escort and use these tools. Student workers and volunteers are not allowed to use the machine shop tools without supervision.

SCIPP lab workers or employees who work with lasers are required to complete the campus laser safety training and the SCIPP-specific laser safety training coordinated by Michal Tarka.

SCIPP labs include high voltage electronics. The International Electrotechnical Commission defines high voltage as voltage above 1,000V for alternating current. All lab workers must complete SCIPP-specific safety training prior to using any high voltage system.

SCIPP uses lead for radioactive materials shielding and also uses lead flux in soldering. All lab workers must complete SCIPP-specific safety training before using either type of lead.

SCIPP lab workers or employees who interact with radioactive materials are required to complete the campus radiation safety training and the appropriate SCIPP-specific training as described below.

SCIPP RADIATION SAFETY

SHIPMENT:

Contact Michele Celello our Radiation Safety Officer, to describe the irradiated material you would like to ship to/from UCSC. She will probably ask for a radio- assay report with detailed radionuclide and activity information. This is something that most facilities should be able to provide; if not, you may be able to substitute a simpler survey report. Even irradiated devices which have cooled down in activity may still be associated with hazards like activated mounting material.

1. With Michele's permission, the package should be addressed as follows (variations possible, but the package should NEVER come directly to the SCIPP office!):

   SCIPP <PI Name>
   c/o Radiation Safety Officer <current name>
   Thimann Labs Receiving
   University of California, Santa
   Cruz 1156 High Street
   Santa Cruz, CA 95064

2. EH&S will survey the package and store it if it cannot be released immediately to SCIPP. EH&S can release mildly activated parts for testing in our lab, as long as proper handling and control protocols are observed. EH&S will hand-deliver the controlled material safely to SCIPP.
3. The arrival scan at SCIPP is not required, but a hand-held frisker unit is available and highly recommended.
4. In the event a package arrives directly in the SCIPP office, immediately contact Michele for instructions and alert Jason Nielsen and the Assistant Director.

TRAINING:

Non-Users are employees, students and volunteers who frequent or work in SCIPP labs. They must review the UCSC Radiation Safety Training for Non-Users and sign off on their Lab Training Checklist.

SCIPP Radioactive Materials Level 1 Users are employees, students and volunteers who work with lab systems that include radioactive sources. They open the systems to exchange samples or make adjustments. They do not directly handle sources and they may not check sources out. These individuals must complete the UCSC EH&S

Radiation Safety online course through the UC Learning Center and complete the SCIPP- specific training for Level 1 users.

SCIPP Radioactive Materials Level 2 Users are employees, students and volunteers who are authorized users of radioactive sources. They are responsible for checking out, moving and securing sources within SCIPP labs. These individuals must complete the UCSC EH&S Radiation Safety online course through the UC Learning Center and complete the SCIPP-specific training for Level 2 users.

1. It is imperative that staff and students wear gloves when handling radioactive sources even if they remain in their cases. Gloves can be scanned with a Geiger counter after handling sources. If the gloves read more than 2x background, place them in the bucket for radioactive waste and notify the Lab Manager immediately. If the gloves are less than twice background they can be thrown in the regular trash.
2. If the sealed source is removed from its case during experimentation wipe test the source prior to returning it to its case.
3. The Lab Manager will perform a monthly wipe test in your lab. This can be done with a small round filter paper or a Kimwipe. Test random areas throughout the lab such as bench tops, hoods, cabinets, door knobs, notebooks etc. Place the filter paper or Kimwipe up to the probe of a Geiger counter to detect contamination.
4. All staff, faculty, and students should complete the radiation safety refresher training on an annual basis. If it is easier for the Lab Manager to perform an in-person training for a specific lab, that can be arranged. The Lab Manager can demonstrate how to use the Geiger counter and how to clean up spills in the event of a leak of radiation. Lab workers should not do this on their own.