

Sector 6 orientation: 6-ID beamlines and laboratories

Magnetic Materials Group, X-ray Science Division

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U.S. DEPARTMENT OF
ENERGY

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**Advanced
Photon Source**

6-ID Orientation Outline

- Section-1:
 - General Safety/Emergency
- Section-2:
 - Beamline-specific information
- Section-3:
 - Other hazards: Electrical safety, pressurized systems, cryogenics, high magnetic fields

- In-person orientation needed for,
 - Beamline search process
 - Special equipment (magnet, laser...)
 - Cryogenics
 - Gas cylinder exchange
 - Sample change

“Safety first” and “Stop authority”

■ Safety First:

- No work is so important that it needs to be done without assuring proper safety measures in place.



■ Stop Authority:

- If you see work or actions that may put you or others at risk, you have the responsibility to stop the work and bring the situation to the immediate attention of your local contact and/or the floor coordinator.

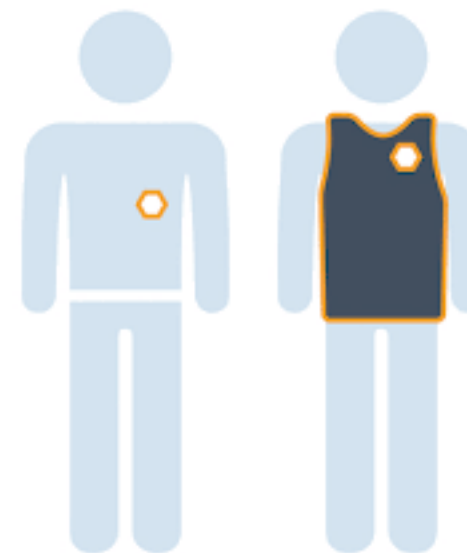
Emergencies



- In case of an emergency,
 - Dial **911** using an ANL phone
 - Dial **630-252-1911** using a cell phone
- Emergencies include: **Injuries, Fire, Water leaks, Electrical shock, Laser exposure**
- If possible, have someone available to direct emergency personnel to the exact location.
- **Tornado shelters** for the Sector 6 area are men's and women's restrooms.
- When a **fire alarm** goes off, you should immediately evacuate the building.
- If required to evacuate the building, the assembly point for Sector 6 occupants is outside of LOM Bldg 434 (sectors 13-16)

Dosimeter requirements

- All personnel on the APS Experiment Hall floor are required to wear a dosimeter. The dosimeter must be worn on the torso midway between the neck and waist.
- Dosimeters are not required in the laboratory office modules



Safety equipment

- Fire extinguishers can be located by the identifying signs
- Again, do not use fire extinguishers unless you have received training to do so
- Eye-wash and chemical safety shower are located in the B030 Wet Lab.



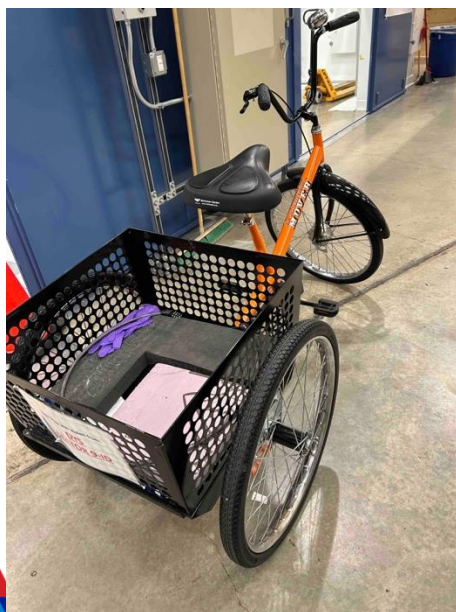
Restricted Areas

- At sector 6 you may encounter restricted access areas, such as laser and magnet enclosures.
- To enter these areas, you must have the **required training and authorization**. You must follow all posted entry requirements.



Pedestrians and tricycles

- Pedestrians in the experiment hall share the walkways with a variety of motorized/moving vehicles (e.g., forklifts, scissor lifts, and tricycles).
- Pedestrians must exercise caution and look in both directions before stepping into a walkway from the laboratory/office modules (LOM) or beamline areas. Mirrors are located across exits from LOM and BL areas areas



Working alone

- When your activities involve significant hazards, you are not permitted to work alone.
- If you will be working alone conducting non-hazardous activities, it is good practice to inform your local contact that you will be doing so.



Enclosure (hutch) doors

- You are **not allowed** to be inside an experiment station (“hutch”) with the doors closed.
- If you find yourself inside a locked station you can deactivate shutter permit (Emergency beam stop box) and open the pneumatically actuated doors (door control box) by depressing emergency buttons located along the wall.



Searching enclosures

- A "Search and Secure" must be conducted before beam will be allowed into an experimental station/enclosure
- This process requires pressing more than one search button distributed inside the enclosure, ensuring nobody is left inside before beam is allowed into the station
- Only ONE person can conduct a search and secure at a time.
- You will be taught how to conduct a Search and Secure by a beamline representative.



Radiation Safety Tags

- Configuration controls serve to protect personnel from radiation exposure.
- These components are marked by yellow tags and **MUST NOT** be moved or modified.



Personnel Safety System (PSS)

- The PSS is the interface to the beamline x-ray shutters and active shielding components (hutch doors).
- Each experiment station has a PSS screen allowing you to control shutters (open/close) in the Sector's experiment stations.
- Note that accidentally knocking the user enable key out of position will disable shutter operation.
- PSS faults have to be cleared by the Floor coordinator.



Electrical Equipment

At the APS you are NOT allowed to use electrical equipment that has not undergone inspection by a Nationally Recognized Testing Laboratory (NRTL) or an ANL/APS Designated Electrical Equipment Inspector (DEEI)

If you plan to bring homemade electronics or electrical equipment that has not been inspected and tagged by an NRTL please send your equipment **AHEAD OF YOUR EXPERIMENT** and have your local contact coordinate an inspection with an APS/DEEI.

In addition, the following activities are prohibited:

- Rewiring electrical plugs and pre-existing cables
- Connecting and Disconnecting motor cables with power on

Equipment Protection System (EPS)

- The EPS system monitors beamline vacuum, water flows, temperatures, and gate valve positions.
- Vacuum gate valves are controlled within this system.
- EPS failures such as vacuum or water trips are handled by your local contact.



Hoisting and Rigging

- The 6-ID-B and 6-ID-C and 6-ID-D hutches are equipped with 1 Ton bridge cranes. You may use the hoist located in 6-ID beamlines, only after completing APS Chain fall Hoist Training (APS21111).
- Safety shoes, safety glasses, hard hat and work gloves are required to use the chain fall hoist.



Gas Cylinders

- Before changing gas cylinders, in-person training from your local contact is necessary.
- Gas cylinders are stored in the gas yard between sectors 4 and 5.



Radioactive Samples

- Restrictions apply for,
 - shipping samples in and out of APS,
 - sample containment during experiment,
 - sample access during experiment,
 - and unattended experiments off hours.

You must talk to your beamline contact and/or APS floor coordinators if you are planning on measuring radioactive samples at the APS

Sample Preparation Facilities

- Located in sector 6 wet lab 432/B030
- Users are responsible for cleaning up sample preparation area and all tools used.
- It is your responsibility to remove samples from the facility at the end of your experiment and to label any chemical waste generated.



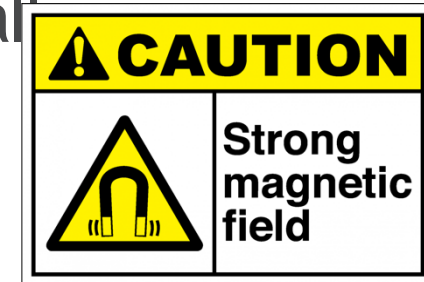
Cryogenics safety

- A LN2 filling station is located in the truck-lock area across from 4-ID-H enclosure
- You must wear proper personal protection equipment (PPE) to operate the LN2 filling station (face Shield, long sleeve gloves, apron)
- You must also wear proper PPE to transfer LHe into cryogenic magnets.
- When filling cryogenics inside the enclosure, the enclosure doors must remain open.
- If the oxygen monitor alarms, personnel shall not enter the hutch



High Magnetic field safety

- Magnetic fields are present in 6-ID-C experimental hutch with fields up to 4 or 35 Tesla depending on superconducting or pulse field magnet configuration. Extreme care is needed to ensure that no metallic tools are left in the vicinity of the magnets before they are energized. This include the chain fall hoist attached to bridge cranes
- Sample changes in magnets should never be done while magnets are energized
- Superconducting magnets have “persistent” modes. Beware that magnetic field can be present even with no current in the power supply !



Lab Safety Policies

- There are two labs available for users:
 - 432\B020 (Dry Lab) and 432\B030 (Wet Lab)
- Users are required to wear safety glasses while in the labs, which are located outside each lab next to the doors
- A Material Safety Data Sheet (MSDS) is located outside of 432\B030, and a complete list can be found at:
http://www.aps.anl.gov/Safety_and_Training/User_Safety/msdsresources.html
- All chemicals/materials must be labeled! Label all beakers/containers with their contents.
- Chemical waste must be disposed of properly. Please do NOT pour chemicals down sinks. Speak with your local contact for proper disposal.



Liquid Helium

- Users are responsible for liquid helium charges. If your experiment requires liquid helium, please contact the user office to set up an account.

Shipping of Samples

- Users are responsible for any shipping charges incurred for the return of equipment or samples. Please provide your preferred carrier and account number to your beamline host. Argonne shipping requires material data safety sheets for any hazardous samples.

Shipping policy and Transport of Samples

- Users are required to comply with U.S. Department of Energy, Argonne National Laboratory, and APS requirements for inbound and outbound shipping.
- In general, users are not permitted to either transport hazardous material on the Argonne site or arrange for shipment directly to the APS. Hazardous materials must be processed through Argonne's hazardous materials receiving area. Special provisions apply for small-quantity exceptions and biohazards.
- The APS User Experiment Safety Coordinator, Nena Moonier is available for guidance and assistance (nmoonier@aps.anl.gov)

Radioactive Samples

The following restrictions apply for **radioactive** samples:

- shipping samples in and out of APS.
- sample containment during experiment
- sample access during experiment
- unattended experiments off hours

Off Hours Support

- Between 10:00 pm and 6:00 am, only urgent support calls to your local contact.
- Floor coordinators are on site until 10:00 pm and can be paged at 2-0101.
- Additional information on 6ID beamline capabilities is available at <http://www.aps.anl.gov/Sectors/Sector6/home/>

Before you Leave.....

- Users are responsible to clean up before leaving!
- □ Do not leave without your samples; we take no responsibility for samples left behind. If necessary, speak with your local contact to arrange shipments of samples/materials.
- □ Please clean up any workspaces used in the laboratories and return any equipment/tools when finished
- □ Sector 6 provides users with an office in 432/B006. Please be courteous to others and take all food and belongings with you when you leave