



Advanced Photon Source

A U.S. Department of Energy, Office of Science,
Office of Basic Energy Sciences national synchrotron x-ray research facility

WELCOME TO APS 101 APS USER ORIENTATION



U.S. Department of Energy



THE UNIVERSITY OF
CHICAGO



Office of Science
Department of Energy



Office of Basic Energy Sciences
Serving the Present, Shaping the Future

This course provides the following:

- information that will enable you to work safely at the APS
- an overall description of the APS Personnel Safety System (an engineered electronic interlock system designed to protect personnel against radiation exposure in the APS experiment hall)

1. APS SAFETY INFORMATION

At the APS, safety is EVERYONE'S responsibility. As such, it plays an integral role in the planning, review, and execution of all activities, including your work here. Accordingly, if you see any work being conducted that you believe may put you or others in immediate danger, you have the right and the obligation to stop the work and bring the situation to the immediate attention of your host beamline and a floor coordinator. If you are asked to stop work, you must do so.

The following information will acquaint you with specific safety precautions at the APS.

2. PROPER ATTIRE IN THE EXPERIMENT HALL

Proper attire for work in the experiment hall includes closed-toe, covered-heel shoes. Sandals are not acceptable.

To enter a construction area, you must wear appropriate clothing and safety equipment. The posted entry requirements could include some or all of the following:

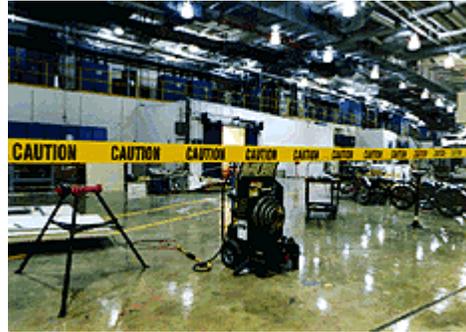
- Safety glasses with side shields
- A hard hat
- Leather safety shoes, preferably ones that cover the ankle
- Long pants
- A shirt with sleeves



3. RESTRICTED AREAS

At the APS, you may encounter restricted areas where construction or maintenance work is in progress. The perimeter of these areas is marked with rope or barricade tape

If you need to enter these areas when active work is in progress, you must be authorized by the person in charge of the work area and adhere to all posted entry requirements (e.g., "Hard Hats Required").



4. PEDESTRIANS

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 or beamline areas.

Watch your speed when operating an APS indoor vehicle.



5. HOISTING AND RIGGING

You may use the hoists located in the experiment stations at the APS only with authorization and training from your beamline host.

If you need help lifting or moving heavy objects, the APS can provide the services of professional riggers. Ask your beamline host to make these arrangements for you.

6. PROTECTION FROM FALLS

If you are working from a surface with an elevation of six feet or greater, fall protection is required. Your beamline host will provide further guidance.

7. WORKING IN EXPERIMENT ENCLOSURES AND WORKING ALONE

According to APS policy, you are not allowed to be in any experiment station with the doors closed. Also, when activities anywhere at the APS involve significant hazards, you are not permitted to work alone; you must remain in sight and sound of a second person who understands the work being performed and knows all pertinent emergency procedures. If you will be working alone conducting non-hazardous activities, make sure that someone from your beamline host or the APS floor coordinator is aware that you will be doing so.

8. USER MACHINE SHOPS

A small machine shop adequately equipped to meet immediate experimental needs is located in each LOM. To use the tools in the shop, you must have proper qualifications and obtain authorization from the LOM shop coordinator. To qualify, you must do all of the following:

- Be certified in advance by the APS.
- Demonstrate proficiency in operating the machines you will need to use
- Have your LOM shop coordinator place your name on the authorized user list

As an authorized machine shop user, you must

- Wear specified personal protective equipment, such as safety glasses with side shields
- Obey all safety postings
- Do your part to keep the shop clean and orderly



9. APS RADIATION SAFETY

Configuration Control. Configuration controls are administrative policies and procedures that govern the placement of critical beamline components that serve to protect personnel from radiation exposure. These components are marked by signs and **MUST NOT** be moved or modified unless a configuration control work permit has been completed and posted. Contact your beamline host for guidance.

Any person who tampers with configuration-controlled components or makes an unauthorized and deliberate attempt to circumvent a radiation-safety-protection system may be denied access to the APS facility and could, potentially, be subject to criminal prosecution. In addition, the beamline will be taken off line until a formal review is completed.

The importance of adhering to ALL radiological safety precautions, including the wearing of dosimeters, cannot be overstated. Nonconformance may result in severe sanctions for the APS and its users under the Price-Anderson Amendments Act.

Lasers. If your experiment will involve Class 3 or 4 lasers, you need to be aware that the use of these lasers requires training and an approved experimental design that includes written procedures. See APS Experiment Hazard Classes 4.3a, 4.3b, and 4.4 for further information. In addition, you must obtain and complete a Laser Facility Checklist from the Argonne Laser Safety Officer. Bruce Glagola, User ESH Support Group Leader (630.252.9797; glagola@aps.anl.gov), can provide additional details.



10. EXPERIMENT SAFETY REVIEW

- Before you arrange your trip to the APS, you must complete an Experiment Safety Assessment Form (ESAF) according to the procedures outlined by the APS.
- Your host beamline and the APS must review all commissioning and experimental activities you plan to conduct at the APS.
- Reviews are necessary to identify an appropriate combination of engineering and procedural hazard controls to maintain a safe working environment.
- The Experiment Safety Assessment Form (ESAF) documents the review and approval process and must be approved by both the beamline and APS; the final Experiment Authorization Form (EA) and Experiment Hazard Control Plan (EHCP) must be posted at the beamline BEFORE any experiment can begin.
- All user activities must be performed in accordance with the safety requirements designated on the EA/EHCP.

Experimental Samples. Known hazards of any materials, including experimental samples, that you ship or bring to the APS must be described on the Experiment Safety Assessment Form (ESAF) that you must complete prior to any scheduled beam time. Each beamline will ensure that hazard information for experimental samples is immediately available.

Hazardous materials must be shipped to/from the APS in compliance with Argonne and US Department of Transportation regulations. Disposal of samples/materials at the APS must follow Argonne Hazardous Waste Requirements. Additional information is available on the APS website. All hazardous materials that are brought to the APS must be declared on your ESAF.

11. THE APS PERSONNEL SAFETY SYSTEM

Maintaining a safe work environment for users is a top priority at the APS. An important component of the APS' safe work environment is the PSS, or Personnel Safety System. The PSS is a reliable, redundant, fail-safe system that prevents radiation exposure.

Because every beamline and experiment station is unique, the specific features and details of the beamline where you will work will be explained to you during your sector-specific orientation.

The following important points are common to all Personnel Safety Systems:

1. Search and Secure

A "Search and Secure" procedure--to ensure that no person remains in the station after the door is closed--must be conducted before beam will be allowed into the station. You must remember that only ONE person can conduct a search and secure at a time. You will be taught how to conduct a Search and Secure during your sector-specific orientation.

2. Emergency Beam Stop and Door Disable Buttons

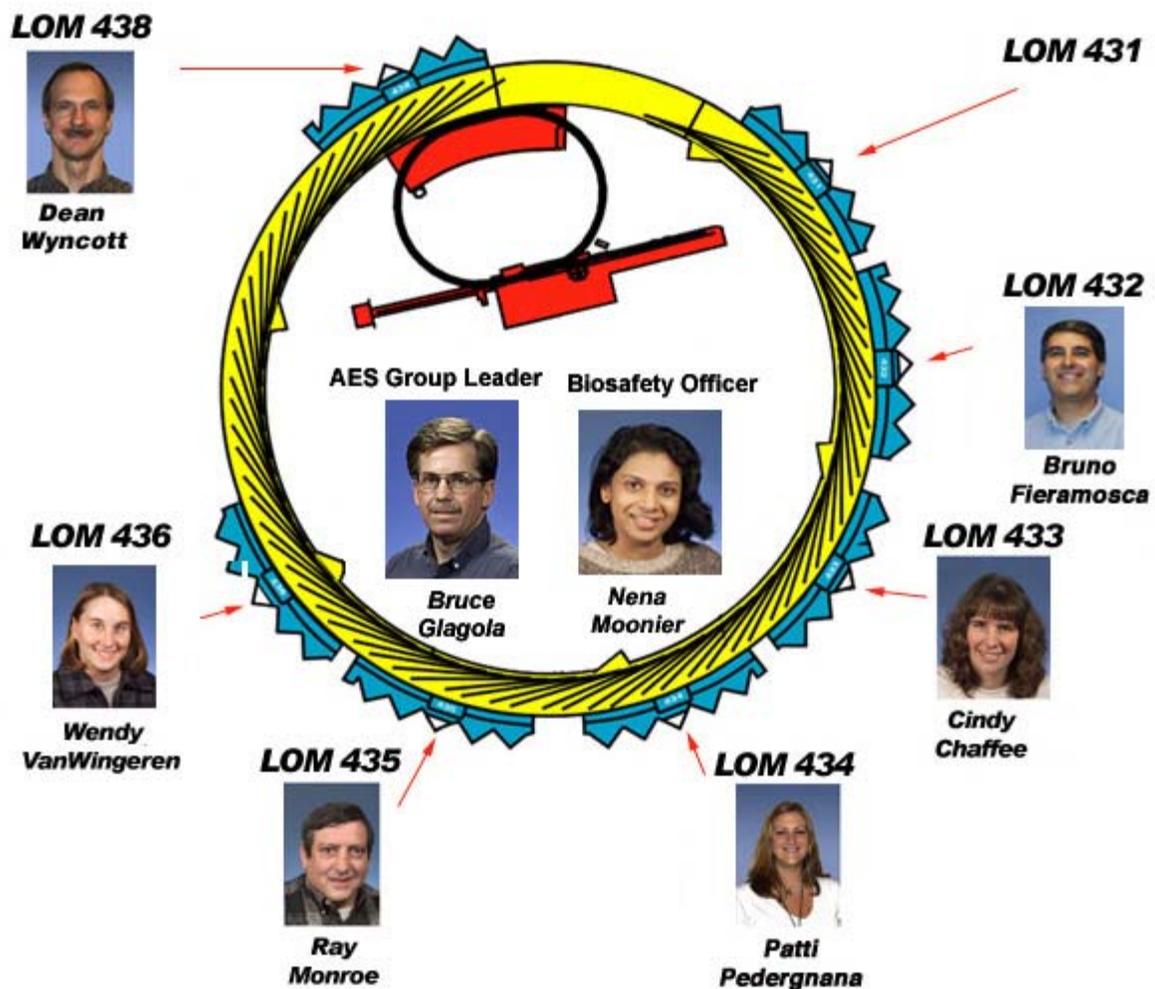
APS policy dictates that NO ONE is allowed inside a station with the doors closed at any time. **In the unlikely event that you are ever left in a station with the doors closed, the first thing you should do is press the red Emergency Beam Stop button.** This action will prevent any beam from entering the station by aborting storage ring operations.



To open a pneumatic station door that has a magnetic locking system and leave the station, push the DOOR OPEN button--automatic doors should slide open. If the door does not automatically open at that point, push the DOOR DISABLE button, which will dissipate any remaining air pressure. You will then be able to push the door open.

12. EXPERIMENT HALL SAFETY SUPPORT

- APS floor coordinators are members of the User ESH Support (UES) and work rotating shifts during user operations periods to provide safety support. They serve as facilitators between the beamline staff and APS/Argonne in obtaining APS or Argonne services. Offices for the floor coordinators are located on the experiment hall side of the central (or "C") pentagon of each LOM as shown below.
- Call 2-0101 from an on-site phone if you have questions.



13. APS ORIENTATION AND TRAINING REQUIREMENTS

Before conducting hands-on work at the APS, users must complete the orientation process. In addition, users who are not employees of Argonne National Laboratory must ensure that a signed User Agreement is in place between the APS and the user's home institution. The orientation process consists of the following steps:

- **Register as an APS user**, which can be done remotely through the following link: http://beam.aps.anl.gov/pls/apsweb/ufr_main_pkg.usr_start_page
- **Receive permission to come to the APS.**
- **Complete all required training.**

APS Users must complete five core courses, sector orientation, and any additional courses required as a result of their specific experiments as described on the ESAF. You may take your five core courses before you arrive by clicking on the following link and follow the instructions:

http://www.aps.anl.gov/News/APS_Today/Announcements/remote_training.html

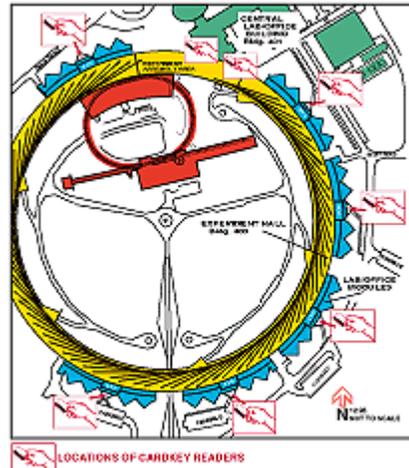
If you have completed General Employee Radiation Training (GERT) at another DOE facility with the past two years, you may skip that course and bring your GERT card to the APS User Office when you arrive. Alternatively, if you want to take all of your training here, access the Web site above, print out the study guides for each course, and call the APS User Office to make an appointment to take the tests. Any additional training specified on your ESAF (e.g., specific training for lasers , radioactive samples, biohazards, etc). must be taken in the APS User Office. Call 630-252-9090 to schedule that training.



13. APS ORIENTATION AND TRAINING REQUIREMENTS (Contd.)

- **Sign forms indicating your agreement to comply with APS/Argonne requirements.**

When you have completed the preceding steps, a User Office staff member will briefly review your orientation packet with you and provide forms for you to sign. After you have signed the necessary forms, the User Office will provide you with an APS user badge. This photo ID/Cardkey® badge provides 24-hour access to the Argonne site and, when activated, to the APS experiment hall and laboratory/office modules (LOMs), as shown in the diagram to the right. You may also use your APS user badge at the main entrance to the central laboratory office building for after-hours and weekend access to the APS library and APS stockroom. The badge can also be used to obtain discounted lodging rates at the AGH.



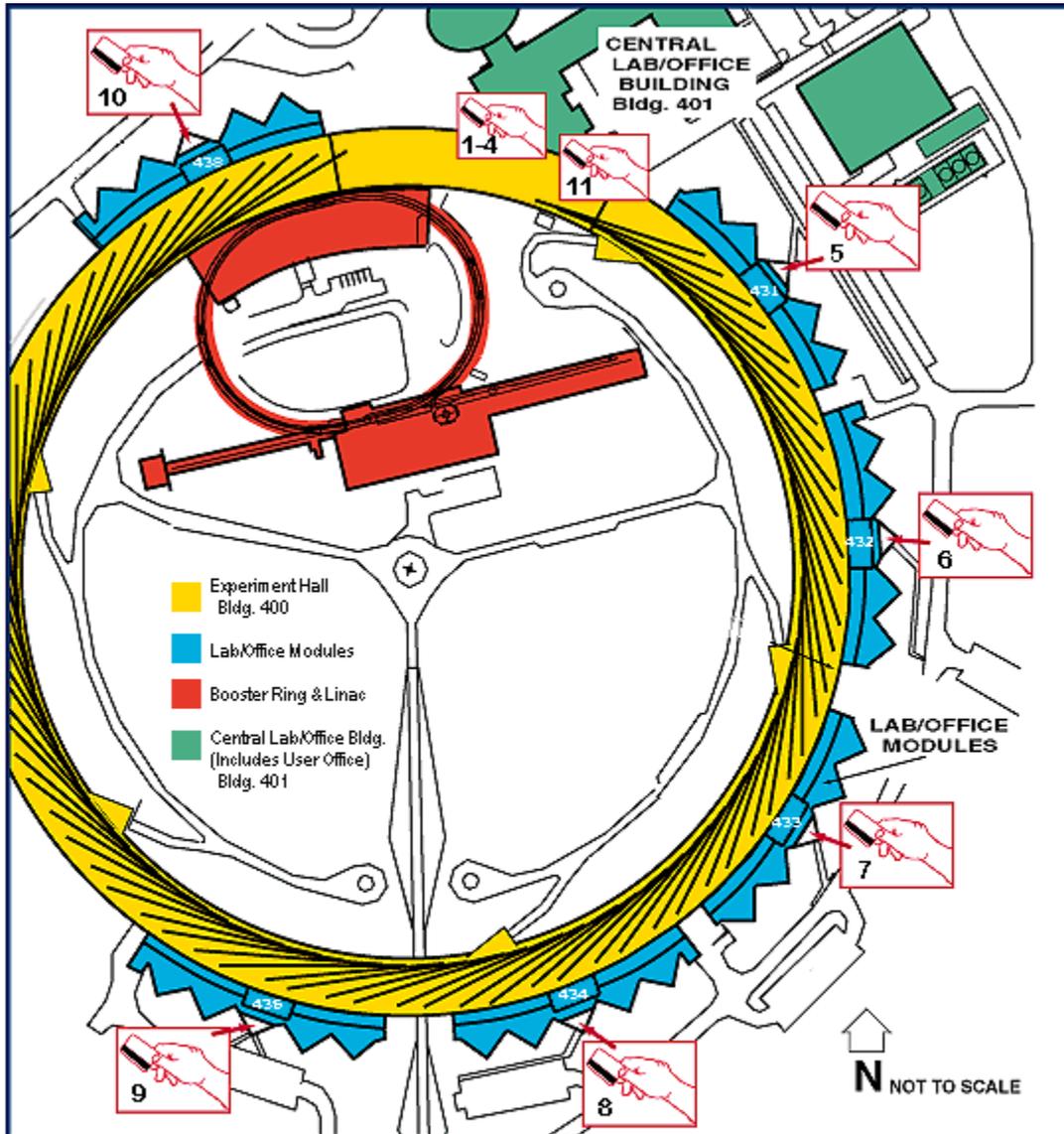
[Click here](#) or on the image above to see a plan view of the APS facility showing the general locations of Cardkey Readers for user access.

Please note: Your APS user badge is for YOUR USE ONLY. You may not use it to bring a visitor onto the Argonne site if that person does not have a badge or gate pass. You may not loan it to someone else to use. Using your badge in an unauthorized fashion may result in suspension of your access privileges. Your badge is government property. When you are no longer associated with the APS, your badge must be returned to the APS User Office.



- Complete sector-specific orientation (APS 2xx, where xx indicates the sector) with your beamline host. Sector-specific orientation must be completed for every sector in which you work.

LOCATIONS OF USER CARDKEY READERS



- | | |
|--|----------------------------------|
| 1. 401 Main Entrance (wheelchair access) | 7. LOM 433 |
| 2. TEST STATION: User Office, 401, Room 1154 | 8. LOM 434 |
| 3. 401 Control Room Sliding Door | 9. LOM 435 |
| 4. 401 Truck Airlock Entrance | 10. LOM 438 |
| 5. LOM 431 | 11. 400 Experiment Assembly Area |
| 6. LOM 432 | |

14. APS USER OBLIGATIONS

The following are considered obligations of all APS users:

- Register with the APS as far in advance of your initial visit as possible (even when you are simply planning an experiment).
- Ensure that a User Agreement is in place between the APS and your home institution.
- Ensure that you complete all required training before conducting hands-on work at the APS.
- Complete Experiment Safety Assessment Form identifying all materials, equipment, hazards, and required controls.
- Complete End of Experiment Forms.
- Acknowledge the use of the APS and your host beamline when publishing results of research conducted at the APS.

The following statement should be used:

Use of the Advanced Photon Source was supported by the U. S. Department of Energy, Office of Science, Office of Basic Energy Sciences, under Contract No. DE-AC02-06CH11357.

- Report all publications resulting from work at the APS to your beamline host and the APS as soon as the publication appears.
- Notify the APS User Office promptly if you relocate to a different home institution or if the Howard Hughes Medical Institute becomes a co-sponsor of your research after you receive your APS user badge. Return your badge promptly to the APS User Office if you discontinue your association with the APS.