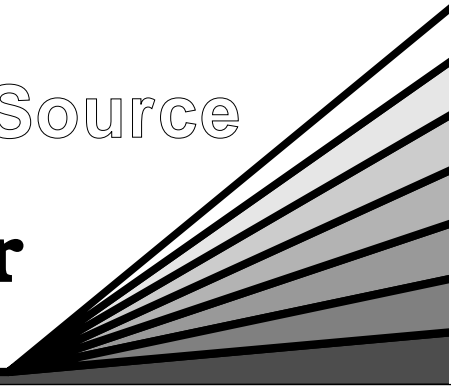




CAT Communicator



Progress Toward Reliability and Stability at the APS

Reliability in storage ring performance and the stability of the photon beam were the highest priorities during the first year of operation at the Advanced Photon Source. These two parameters are critical to conducting optimal research on User beamlines. The APS successfully met the 1997 goals set for reliability and stability.

Availability of photon beam is a traditional measure of performance at synchrotron facilities. This term is defined by the ratio of available radiation beam time over a scheduled time period. Mature facilities typically report availability numbers of 90-95%. Availability is affected by both the number of storage-ring faults and the time required to repair the faults. A sound maintenance program and a good spares inventory of failure-prone parts can increase machine availability. The APS set an availability goal of 90% for 1997.

Reliable machine operation is equally important to the success of User experiments. This translates to a minimum number of losses of the photon beam to Users during experiments. The parameter of reliability is defined as the probability that a given experiment can be completed without an unscheduled loss of photon beam. Unlike availability, reliability is independent of the time-to-repair factor. For 1997, the APS reliability goal was to achieve a mean time to beam loss of 24 hours.

Finally, photon beam stability is also an important parameter in the success of User experiments. Early in the design phase of the APS,

a stability requirement was established that would be achievable if the particle beam emittance was within 10% of its design values in the x (horizontal) and y (vertical) directions. For the photon beam, this translates to 4.4 microns in position along the y direction, and 17 microns along the x direction.

The APS is extremely pleased that these goals have been both met and exceeded during the first year of operation. APS availability is approaching 95%, reliability in terms of mean time between failures has reached 40 hours, and the beam stability has been nearly

Continued on p. 2

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Nominations Sought for Third APS Compton Award

Nominations are now being sought for the Third APS Compton Award, established by the Advanced Photon Source Users Organization (in conjunction with the APS) to recognize an important technical or scientific accomplishment at, or beneficial to, the APS. The third award, which consists of a plaque plus a monetary award of \$2500, will be presented at the Ninth APS Users Meeting, on October 13, 1998.

Nominations should include (in one page) a brief description of the work for which the award is proposed, a statement describing the significance and impact of the work, a short proposed citation, the names of two individuals who will send supporting letters (under separate cover), and the signature of the nominator. (It is the responsibility of the nominator to request the supporting letters.) If the work was accomplished by more than one individual, the award may be shared. Nominations and supporting letters should be sent to Susan Barr Strasser, APS User Office, who will forward complete packages to the selection committee. Dr. Howard Birnbaum (University of Illinois at Urbana/Champaign) will chair this committee, which includes Wayne Hendrickson, Denis McWhan, Roger Pynn, and Jochen Schneider. The deadline for receipt of nominating information in the APS User Office is July 1, 1998. The recipient (or recipients) of the award will be asked to present a plenary lecture at the Ninth APS Users Meeting.

Previous award winners include Nikolai Vinokurov and Klaus Halbach, who shared the award for the development of hybrid undulator x-ray sources, and Philip M. Platzman and Peter M. Eisenberger, whose shared award recognized their theoretical and experimental contributions to the field of x-ray scattering. ▴

Reliability...Continued from p. 1

100% better than original design goals along the x direction and 33% better along the y direction (with fast-orbit feedback and slow-drift corrections).

These accomplishments are the result of excellent User input and hard-working APS staff. Extensive machine and beamline diagnostics systems have also been fundamental to these technical achievements. These systems have provided the capability to look at failure trends and weakness in various subsystem designs within the APS. Constant improvement of all the subsystems has also contributed to the good performance achieved during 1997.

As 1998 begins, the APS plans to deliver 5000 hours of beam time to Users. This will require constant monitoring of hundreds of parameters that govern the performance of the ring, extensive analysis of data, and performing preventive maintenance and required upgrades. These activities carried out within the framework of good conduct of operations will enable the APS to provide the highest quality research facility to its Users. ▴

CAT Communicator is intended to provide timely information to Advanced Photon Source Collaborative Access Team members and associates.

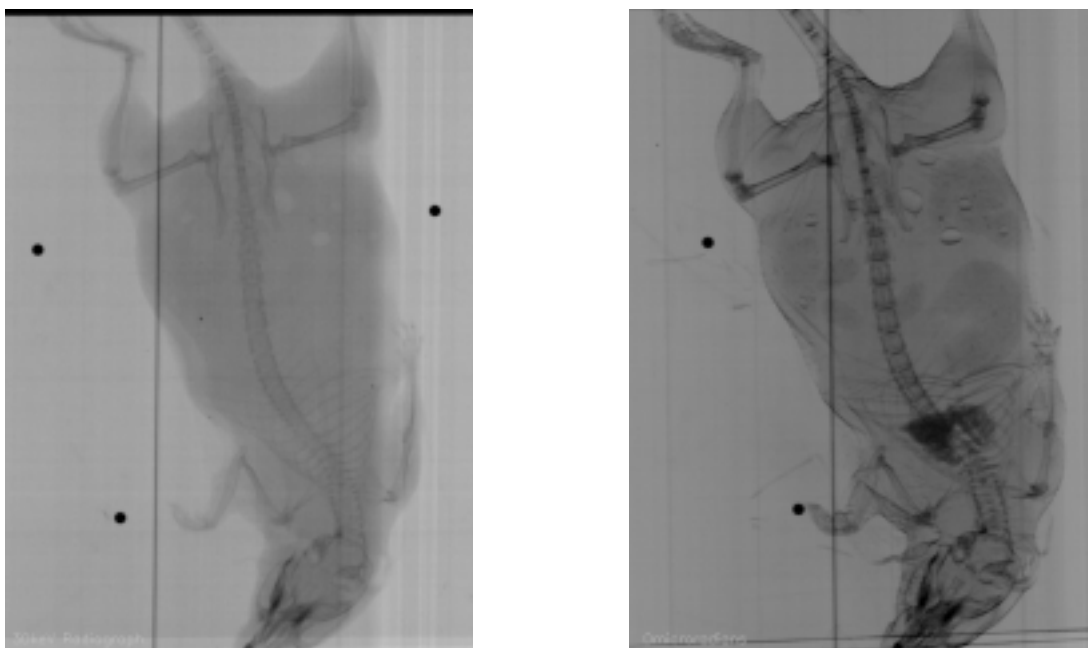
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The Advanced Photon Source at Argonne National Laboratory is supported by the U.S. Department of Energy, BES-Materials Science, under contract W-31-109-Eng-38.

What is the TWG?

The InterCAT Technical Working Group (or TWG) began meeting in 1994 to provide APS Users with a forum for the exchange of technical information and issues related to the beamlines, such as optical element design, beamline control, software development, etc. The first meeting, held at The University of Chicago, was hosted by CARS-CAT (Jim Viccaro, Chair). Subsequent meetings were held at Argonne, and the group now meets once per month at the APS in conference room A1100, Building 401. Recent attendance numbers have ranged from 20 to more than 30, with the majority of APS CATs represented. The TWG has a fairly informal structure, with programs dictated by the current technical interests of participants.

The focus of the TWG in the early days centered on beamline design and construction issues. As more beamlines are completed and commissioned, the focus is shifting to beamline operational issues and detailed discussions of experimental technique. Current co-chairs Dean Chapman (Illinois Institute of Technology) and Dean Haeffner (SRI-CAT) encourage a very open forum and generally accept speakers on any technical topic. General areas of discussion include x-ray experiment design innovations, beamline components, x-ray optics design, motion control, and APS infrastructure, among others. Subcommittees have been formed to address specific technical issues, such as the TWG Detector Subgroup and a subgroup to study the problem of cryogenic pumps tripping during power outages. *Continued on p. 4*



At a recent TWG meeting, Dean Chapman reviewed imaging experiments carried out at 1-BM-B. The left image of a mouse at 30 keV imaging energy shows little contrast due to weak tissue absorption. The right image was taken using diffraction enhanced imaging (DEI), a technique using monochromatic x-rays and an analyzer crystal placed after the object. Note the heart in the mouse image on the right appears to have very high absorption due to the rejection of small-angle scattering associated with heart tissue.

D. Chapman, W. Thomlinson, R.E. Johnston, D. Washburn, E. Pisano, N. Gmür, Z. Zhong, R. Menk, F. Arfelli, and D. Sayers, "Diffraction Enhanced X-Ray Imaging," *Physics in Medicine and Biology*, **42** (11), 2105-2025, (November 1997).

Meet Derek Lacy

Derek Lacy, the newest Floor Coordinator, came to the APS from Bethesda Hospital in Zanesville, OH, where he worked as a medical technician. Derek holds a M.S. in physics from the Illinois Institute of Technology. His recent research interests include computer modeling of phonon and spin fluctuation mediated inelastic tunneling in high T_c superconductors.

At the APS, Derek will be primarily involved in facilitating construction activities and assisting with APS User operations. His office is located in LOM 434.

Derek spends his leisure time with his wife, Juliet, listening to music and playing drums. ♪



TWG...Continued from p. 3

Meetings typically begin at 9:00 a.m. with refreshments, and are called to order at 9:30 a.m. for a review of old business, a facility report by APS staff, and updates on ongoing issues. Technical presentations follow (typically 20-40 minutes each in length) and the entire meeting lasts approximately 1 - 1 1/2 hours. Other talks given at the TWG have highlighted ANL and APS technical services available to the CATs, such as library services, metrology lab capabilities, and computer support.

A recent initiative in the TWG has been to begin update talks presented by one sector or beamline per meeting. These update talks are intended to be a means of sharing both successes and difficulties encountered in operating beamlines at the APS. Future plans for the TWG include the organization of more "themed meetings," (such as a recent meeting focused on coherence and its effect on optics), and a greater emphasis on presentation of cutting-edge experimental

techniques and results (see mouse images and caption, page 3).

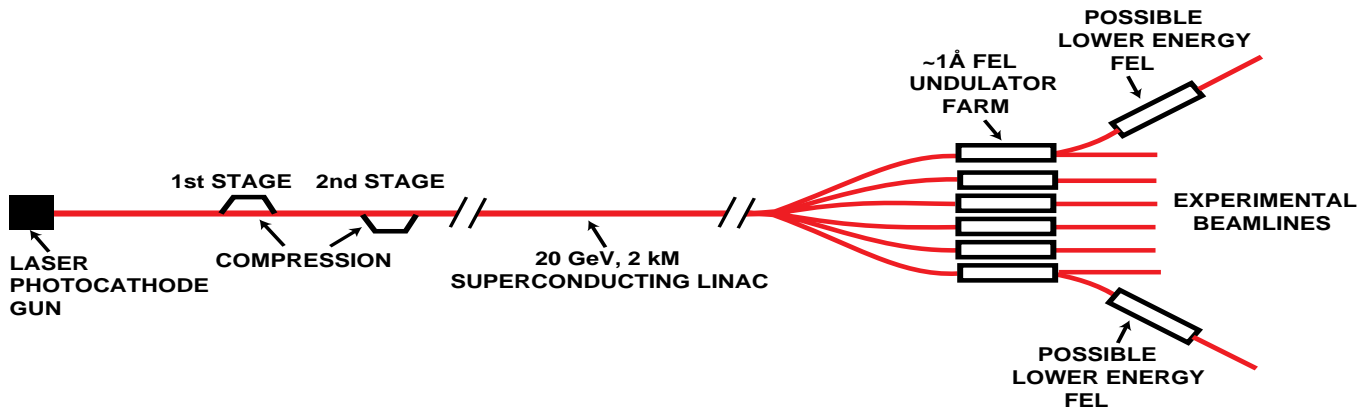
The APS InterCAT TWG home page can be found on the WWW at <http://www.aps.anl.gov/cats/twg.html>. This page includes instructions on how to add a name to the TWG e-mail list, which will ensure that agendas for upcoming meetings are distributed to interested participants. One successful feature of the mailing list has been the posting of technical issues and questions to solicit input from TWG participants. Future plans call for improvement and expansion of the TWG Web pages.

For additional information about the TWG, please contact

Dean Chapman, IIT
chapman@sparky.csrrri.iit.edu

Dean Haeffner, SRI-CAT
haeffner@aps.anl.gov. ♪

The Next Generation: Workshop Focuses on FEL Light Source



POSSIBLE FOURTH-GENERATION SYNCHROTRON FACILITY USING SELF-AMPLIFIED SPONTANEOUS EMISSION (SASE) FELS

The Workshop on Scientific Opportunities for Fourth-Generation Light Sources was held at the APS on October 27-29, 1997. More than 130 attendees from the U.S. and Europe came to the workshop, which was co-hosted by the Stanford Synchrotron Radiation Laboratory, the National Synchrotron Light Source, the Thomas Jefferson National Accelerator Facility, and the Advanced Photon Source. Co-organizers John Arthur, Fred Dylla, Erik Johnson, and Michael Knotek charged participants to develop the scientific case for the use of self-amplified spontaneous emission (SASE) radiation, to review the current status of accelerator technology, and to identify challenges in developing a user facility.

Leading off the opening session was workshop co-organizer Michael Knotek, Argonne National Laboratory Fellow. He emphasized the importance of developing a sound organizational and management plan to work toward a 1Å free electron laser (FEL) facility. Knotek stated that we must “keep thinking about the future and move ahead.” The session continued with

Patricia Dehmer, Director of the DOE’s Office of Basic Energy Science, who discussed the recent Birgeneau Committee’s report, highlighting its review of fourth-generation R&D, and told the group that they “will form the reality of a fourth-generation [light] source.” David Moncton, Associate Laboratory Director for the APS, concluded this session with an overview of the technical attributes that will distinguish the next-generation synchrotron facility from the current facilities.

The first two days of the workshop included a series of morning tutorials presented to acquaint participants with the unique properties and principles of FEL radiation and to demonstrate potential applications for this radiation in various scientific disciplines. Afternoon sessions broke participants into eight working groups to address topics in the areas of phenomenology, sources, and research. The workshop concluded with summary reports from each of the eight working groups and a look ahead to the next steps on the path toward making a fourth-generation user facility a

Continued on p. 14

Safety Note: Working on Live Electrical Systems

Electricity is an inherent and integral part of many aspects of scientific research at the APS.

From complex control systems that monitor delivery of beam into hutches, to simple, everyday utilities such as light switches—electric power

pervades our work environment. Because historical trends at synchrotron research facilities have shown that most safety incidents involve electricity, it is important to know and understand the recommended practices for working safely on live electrical systems.

The Department of Energy's *Electrical Safety Guidelines* and the *National Electrical Code Handbook* provide guidelines for work space around electrical systems. Any electrical equipment likely to require examina-

tion, adjustment, service, or maintenance while energized should have sufficient

access and working space provided around the unit.

Working "hot" electrically at the APS is defined as working on an energized electrical source with a potential to ground of 50 volts or more. Work-

ing "hot" should only be done when necessary. If you must work "hot" on an electrical energy source, a clear space no less than 30 inches wide in front of the work area, and 6.5 feet tall (or the height of the equipment, whichever is greater) should be maintained. If the equipment is wider than 30 inches, the left-to-right space must equal the width of the equipment. Any doors on the equipment should be capable of a 90-degree opening angle. The depth of the working space can vary from 3-4 feet depending on the construction of the wall or equipment opposite the work area (see

Continued on p. 7

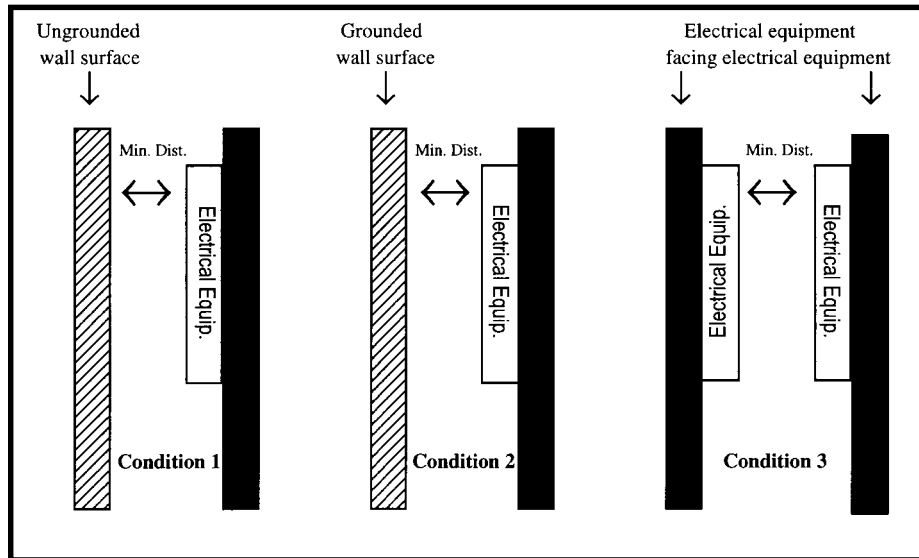


Figure 1: Illustration of Working Space Depths



Larry Schultz of West Elsdon Electric checks an electrical box that has the proper work space allowance in front of it.

Safety Note...*Continued from p. 6*

Figure 1 and Table 1). These recommended minimum work space dimensions provide room to prevent body contact with metal parts while live current is present and also provide access for safety personnel in the event of an emergency.

A Hot Work Permit must be obtained from an APS Floor Coordinator to work on energized circuits except for routine electronic and electrical work of a developmental or testing nature. Work of this nature must still be carried out in accordance with definitive procedures and posted house rules of electrical safety. All “hot” work activity should be planned in advance with the guidance of your CAT Safety Coordinator. If the recommended safe work space dimensions cannot be achieved, then electrical power *must* be locked out/tagged out before any working access is granted.

| Nominal Voltage to Ground (volts) | Condition 1 | Condition 2 | Condition 3 |
|-----------------------------------|--|-------------|-------------|
| | Minimum Clear Distance (depth in feet) | | |
| 0 - 150 | 3 | 3 | 3 |
| 150 - 600 | 3 | 3.5 | 4 |

Table 1: Working Space Clearances

A guide for conducting a walk-around electrical inspection of your work area may be borrowed from your Floor Coordinator or from the XFD ES&H secretary, Roseliz Ortiz (ext. 2-6746, Bldg. 401, B1147C). The guide, called *Electrical Inspection Illustrated*, published by the National Safety Council, contains useful, clear photographs. Additional guidance for good safety practices for working “hot” can be found in the “Electrical Safety” portion of the *APS User Guide*, and in Chapter 9-1, “Electrical Safety,” in the *ANL Environment, Safety and Health Manual*.

Technical questions about working on electrical systems at the APS can be directed to

Bruce Glagola, User Technical Interface
ext. 2-9797, glagola@aps.anl.gov

Bruce Stockmeier, ES&H Coordinator
ext. 2-9394, bcs@aps.anl.gov

Bill Wesolowski, APS Floor Coordinator
ext. 2-0300, waw@aps.anl.gov. ⬇

Acknowledging Use of the APS

When results obtained through the use of the Advanced Photon Source are published in journals, books, conference proceedings, or other printed technical media, the following acknowledgment statement must be included in the manuscript:

Use of the Advanced Photon Source was supported by the U.S. Department of Energy, Basic Energy Sciences, Office of Energy Research, under Contract No. W-31-109-Eng-38.

Users should also be aware that appropriate acknowledgment of the resources provided by host CATs and affiliated institutions, CAT staff, and funding agencies should also be included in technical publications.

One copy of each published manuscript must be provided to the APS User Office, Building 401, Room B1154 as soon as possible. Please call 252-9090 with any questions. ⬇

SRI-CAT Now Accepting Independent Investigator Proposals

SRI-CAT is the first APS CAT to officially declare one of its stations operational and is now ready to accept Independent Investigator (II) proposals for beam time. IIs are defined as qualified researchers who would like to use APS beamlines, but are not members of the CAT(s) that own and operate the beamline(s) of interest. Descriptions of the SRI-CAT beamlines, with information about their capabilities, are available through the SRI-CAT home page on the World Wide Web at

http://www.aps.anl.gov/sricat/sri_cat_home.html.

For time on SRI-CAT beamlines, prospective IIs should first contact SRI-CAT Director Dennis Mills (e-mail: dmm@aps.anl.gov or telephone: 630/252-5680) for preliminary discussion to determine if SRI-CAT has the appropriate capabilities. If so, the prospective II should submit a proposal to

the APS User Office describing the research, addressing its scientific purpose and importance, and explaining the need for APS x-rays. Proposal forms are available from the APS User Office; they are also available on the Web and can be accessed from the User Information home page. When proposals are received, the APS will screen them for completeness and general safety requirements, then forward them to SRI-CAT, which will evaluate the proposed work for scientific merit and technical feasibility. When a proposal is accepted, the proposer will be given the name of a contact person within SRI-CAT. This contact will coordinate scheduling, technical support, and appropriate training.

Questions about the readiness of other APS CAT beamlines to accept II proposals should be addressed to Susan Strasser in the APS User Office. ▾

Check It Out: On-Line Restaurant Guide Has Coupon Link!



The Restaurant Guide now has a link to the “H.O.T. Coupons” site offering money saving coupons for *local* restaurants! The link can be found at the end of the restaurant list. Simply click on the name of the eatery offering the savings and print out your coupon on any printer! The Restaurant Guide can be found on the User Information home page at

<http://www.aps.anl.gov/ui>

Make a bookmark for quick reference! ▾

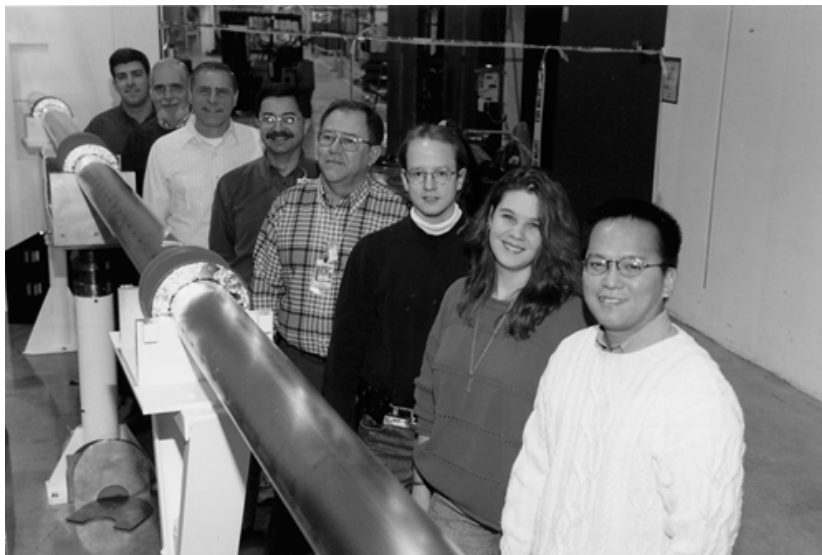
User Support Recognized at the APS

The APS recently recognized two very important technical support groups—the Experimental Facility Division’s (XFD) Floor Coordinators and the Accelerator System Division’s (ASD) Operations Group—for their dedication and hard work. In a meeting on November 18, 1997, nine Floor Coordinators were presented with letters of appreciation and token gifts from XFD Division Director Gopal Shenoy and User Technical Interface Group leader Steve Davey on behalf of the APS Users and XFD employees. The letters cited the Floor Coordinators’ leadership and communication skills, emphasizing the extremely positive impact they have had on the User community at the APS.

Floor Coordinators

FRONT TO BACK: Rod Salazar, Trudy Bolin, Kevin Beyer, Bob Ferry, Tim Smith, Bill Wesolowski, Frank Bellinger, and Steve Vanni.

Not pictured: Eduardo Roa.



Accelerator Operations Group
BACK ROW (L to R): Kurt Boerste, Joseph Scapino, Joe Budz, Jim Vie, and Steve Christensen.

FRONT ROW (L to R): Mike Hahne, Greg Edwards, Lester Erwin, and Dee Anna Weyer.

Not Pictured: Randy Flood, Steve Jones, Eric Lindert, Dmitriy Ronzhin, and Dave Yuen.

Members of the Accelerator Operations Group were recognized at CAT Chat on November 21, 1997, for their integral role in the success enjoyed by the APS Users this year as the machine has continued to steadily improve in performance and reliability. Nine of the 15 were present to receive praise from Gopal Shenoy for their selfless contributions. Each was presented with a letter of thanks from the APS Users and XFD employees and a token of appreciation for their hard work. 📌

Telecommunication Advances at the APS

Video teleconferencing capabilities are currently being developed under a multiphase plan to expand communication options at the APS. At present, the APS has cable television infrastructure in place that is used in conjunction with Argonne National Lab's cable system to provide telecommunication of seminars, classes, schedules, and data (e.g., the real-time operational status of the storage ring). These broadcasts are available throughout the APS in conference rooms and lobby areas, and in the Argonne Guest House for the convenience of visitors and researchers.

The first phase of the project is already in use by many APS staff members and involves the implementation of MBONE (which stands for IP Multicast Backbone on the Internet). MBONE is a computer-workstation-based system that achieves near-real-time communications over local wide-area computer networks. Both UNIX workstations and PCs can initiate video and audio using public-domain software. Equipment requirements are a camera and video-capture electronics, costing approximately \$2000 (less for a PC). Monitoring only of MBONE sessions requires just the public-domain software. Audio transmissions can be encoded to keep a session private. A resource for information about MBONE can be found on the Web at <http://www.best.com>. An Argonne Web site offers additional information at <http://www.el.anl.gov/mbone.htm> (note the 3-letter file extension).

Phase two of the teleconferencing plan focuses on the implementation of one-way broadcasting, which can be used to conduct video conferencing on site. Conference room B2100 in Building 401 is currently being outfitted with a remote-controlled, wall-mounted mobile camera to monitor participants, a fixed camera to transmit images from an overhead screen, and a table-top camera used to project images of

papers or documents. Transmissions can be telecast via cable television throughout the APS and ANL on monitors in other conference rooms, or in the LOMs, allowing participants to view in-progress seminars. A facility such as this might be used to conduct meetings like CAT Chat. These transmissions can also be put on MBONE for desktop viewing on- or off-site. One-way on-site video conferencing capability is expected to be fully operational in three to four months.

The development of network-based two-way teleconferencing is the third phase of the plan. The use of protocols such as ATM (Asynchronous Transfer Mode) and ISDN (Integrated Services Digital Network) can provide a near-real-time telecommunication interaction. (The use of proprietary network equipment is discouraged due to lack of compatibility with more commonly available systems.) A CAT could choose a proprietary teleconferencing system for internal purposes, but if all CATs use the same network-based system, other inter-CAT and CAT-APS applications will be possible.

The potential for audio-visual communication tools such as these goes far beyond traditional conferencing. For example, an on-going R&D effort at ANL, called the TelePresence Electronic Laboratory, provides an example of live video imaging with remote control. This project is being developed to facilitate interactive, real-time collaboration for research and teaching. This Web site can be viewed at <http://www.amc.anl.gov/docs/anl/TPM/TPMHomepage.html>. Questions about planned video teleconferencing capacity at the APS can be directed to

Marty Knott ext. 2-6609
mjk@aps.anl.gov, or

Bill McDowell ext. 2-6975
wpm@aps.anl.gov.

ECT Division Support Available for CATs

Argonne's Electronics and Computing Technologies Division (ECT) can provide a wide range of computer support services to APS Users on a fee-for-service basis. The diversity of the support offered creates a "one-stop shopping" opportunity for the computer support needs of the User community. ECT offers computer administration support for UNIX, PC, and Macintosh workstations. Both remote and wide area connectivity can be coordinated. Wide-area file systems, such as the Andrew File System (AFS), are available. Users can also enhance the security of their computing activities and access several network-available graphical output devices using ECT services. ECT can also provide World WideWeb technology. ECT's skilled staff can design, install, and administer Oracle databases. In addition, Users can access a diverse array of applications. These services are summarized below. APS Users interested in these services should contact John Volmer at ext. 2-5449, or e-mail at volmer@anl.gov for further information. ▸

| <i>ECT SERVICE AREA</i> | <i>DESCRIPTION</i> | <i>WEB ADDRESS</i> (for further information) |
|---|---|---|
| Computer Service and Administration | | |
| Parts | on-site inventory maintained; maintenance contracts available | |
| Operating Systems | can install and troubleshoot workstations; support plans offered for patch installation and monitoring | http://www.anl.gov/ECT/Public/sysadm01.html |
| LANs | expertise in design and installation; can advise on equipment and provide on-site maintenance | |
| Remote/Wide Area Connectivity | | |
| SLIP and PPP | remote access to internal networks, connectivity to externals; modem speeds up to 28.8 Kbaud | |
| Appletalk Remote Access | allows Mac users access to many ANL Mac services | http://www.anl.gov/ECT/software/mac_resources.html |
| Wide Area Connectivity | Internet access to many national networks; can work with any organ- ization to plan and obtain connectivity | |
| File Services | | |
| Andrew File System (AFS) Distributed File System (DFS) | offers many advantages over UNIX NFS and Windows NT file servers | http://www.anl.gov/ECT/Public/afs.html http://www.anl.gov/ECT/DCE http://www.anl.gov/ECT/Public/afslib.html |
| Security | | |
| DCE Cell Services | used to conduct secure authenticated sessions | http://www.anl.gov/ECT/DCE |
| Entrust Certification Authority (planned) | public/private key technology en- abling digital signature of documents | http://www.anl.gov/ECT/certify |
| Output Devices | | |
| Graphical Output Devices | several accessible from network, including IBM 3900 printer | http://www.anl.gov/ECT/ibm3900.html http://www.anl.gov/ECT/Public/outpsrv1.html |
| WWW Services | | |
| CGI Application Development | create WWW forms and CGI-bin programs | |
| Database Integration | allow WWW forms to exchange data with Oracle databases | http://www.anl.gov/ECT/oracle/oracleint.html |
| Information Indexing and Search Engine Strategies | can create lab-wide and application specific search capability | |
| DCE Authenticated WWW Services (planned) | provide single network logon and access control to WWW | |
| Oracle Database Support | | |
| | offering skilled installation, administration, siting, and design of databases | http://www.anl.gov/ECT/oracle/oracleint.html |
| Applications | | |
| Electronic Mail | for PC: Windows NT, cc:Mail for Mac: Quickmail POP3 and X.500 services | http://www.anl.gov/ECT/software/mac_resources.html http://www.anl.gov/ECT/CUG/9604/pop3.pdf |
| UNIX | large library of public domain and licensed UNIX applications | http://www.anl.gov/ECT/Public/afslib.html |
| PCs | planning a Windows NT file server to offer various applications | http://www.anl.gov/ECT/CUG/9610/ect_ntsv.pdf |
| Backup | remote backup services available for workstations | |

Computer Security: Tips and Resources for Detecting Break-Ins

Security breaches of computer systems at the APS pose a potential risk for everyone. Simple steps can be taken to check the integrity of and minimize vulnerability in your system. The intruder community is continually evolving more sophisticated techniques to evaluate programs for weaknesses, even in the absence of source code. Common vulnerabilities typically result from operating systems and applications not being updated, and new security patch releases not being applied, allowing intruders access to password files, account files, and other potentially sensitive information.

While detecting break-ins on your computer systems is not a trivial matter (only two to five percent of systems actually detect break-ins), conducting break-in checks as part of a regular security inspection is a good front-line effort at protecting system integrity. The following signs may indicate that your system has been compromised.

- Check your log files for suspicious activity. This might include logins at atypical hours, long logins, or connections from unusual locations. Examining system logs can also help define the scope and chronology of break-ins. Finding no suspect activity on your logs does *not* mean that your system is secure: Know that intruders may alter log files and even system clocks to cover their tracks.
- Examine your entire system for set-uid (especially root files) and set-gid files. Set-uid copies of /bin/sh or /bin/time can be left after a break-in to allow the hacker root access at a later date.
- Scan your entire system for problem files with names that include strange characters or trick names like "...". Hidden files on your system can be used to store password cracking programs and other tools used by intruders.
- Look for odd network connections, unusual use of tools, dial-out modem usage, and significant system use to help detect intruders. Some root and system directories can automatically have e-mail generated in the event of a problem.
- Inspect your system's configuration files. Unauthorized additions or alterations may indicate that your service programs have been replaced with Trojan horse programs. Check password files for suspicious modifications, especially new, unfamiliar accounts and accounts without passwords. Look for unauthorized entries and non-local host names in files on your system and network configuration files.
- Evaluate "cron" and "at" queues to make sure that intruders have not left "back doors" or automated scripts in these files that will allow future access to your system.
- Check your system binaries and look for evidence of tampering.
- Look for evidence of use of a network monitoring device or "sniffer." These devices may be used to collect user account and password information.
- Inspect all stations on your local network when checking for intruders; if one machine has been compromised, chances are others have as well.

Continued on p. 15

Central Liquid Nitrogen Distribution System Planned for APS

A proposal for the design and installation of a centralized liquid nitrogen distribution system at the APS has been submitted by the APS CATs to the U.S. Department of Energy (DOE). The vacuum-jacketed cryogenic distribution system would provide liquid nitrogen to each sector at the APS for beamline use, e.g., for high-heat-load optics. Liquid nitrogen would be transported via vacuum-insulated transfer lines from four storage tanks (distributed around the outer perimeter of the experiment hall) to four manifolds located above the storage ring shielding tunnel. The system would be capable of supplying a flow rate large enough to sustain maximum usage on each manifold. Storage tank levels would be maintained by regular liquid nitrogen deliveries from a vendor.

A centralized system would offer, especially for continuous operation mode, the advantages of decreased manpower costs, increased system reliability, and improved safety over the current system of using portable dewars that must be transported around the experiment hall for filling and use. Use of dewars is especially impractical for wiggler systems because of the large-volume demand for liquid nitrogen (as much as 50 liters per hour). Most CATs at the APS have gained experience in the use of cryogenically cooled first crystals in their monochromators at the 100 mA operating level, handling about 160 W/mm^2 of power. As higher ring currents are achieved, this capability will become even more desirable.

Design, procurement, installation, operation, and maintenance of the system will be managed by APS operational staff.



Debra Hilborn of IMCA-CAT works with a portable dewar that could be made obsolete with the advent of a centralized liquid nitrogen system.

CATs will be individually responsible for the design, funding, and construction of piping to transport liquid nitrogen from the manifold serving their sectors to their beamline equipment. Once funding is provided by DOE, bidding from vendors should take approximately 60 days. Work is expected to be completed nine months after the contract is awarded if full funding is received. Contact Steve Davey, User Technical Interface Group (e-mail: scd@aps.anl.gov) with any questions. ▴

1998 CAT Calendar

| Date | Event |
|---------------------|---|
| April 30, 1998 | APSUO Steering Committee Meeting |
| May 1, 1998 | Research Directorate Meeting |
| June 18, 1998 | APSUO Steering Committee Meeting |
| June 19, 1998 | Research Directorate Meeting |
| August 4-8, 1998 | 6th International Conference on Biophysics and Synchrotron Radiation |
| August 10-14, 1998 | 10th International Conference on X-ray Absorption Fine Structure |
| August 16-21, 1998 | 20th International FEL Conference and 5th FEL User Workshop, Williamsburg, VA |
| August 20, 1998 | APSUO Steering Committee Meeting |
| August 21, 1998 | Research Directorate Meeting |
| October 12, 1998 | Research Directorate Meeting |
| October 13-14, 1998 | Ninth Users Meeting for the Advanced Photon Source |
| October 14, 1998 | APSUO Steering Committee Meeting |
| October 14-15, 1998 | APSUO Workshops |

FEL...*Continued from p. 5*

reality. Michael Knotek stated that the goal is "maximum progress." He said that to accomplish this, the technical community must seek the best technology and set clear milestones.

The workshop report is being co-authored by representatives of each of the four host laboratories. Plans call for the report to be

available in an electronic format on the World Wide Web. It will also be available on a CD-ROM when the report has been completed. The Web site has been envisioned as a growing and continually evolving site for the exchange of information. For additional information about the workshop, please contact Anne Owens, extension 2-3168. ▴

Security...Continued from p. 12

Among the excellent resources available to help you stay informed about current weaknesses being exploited by the intruder community and the patches you can use to strengthen your system's security are the CERT (Computer Emergency Response Team) Summaries from Carnegie Mellon University. These reports focus on recent attack trends and include advice on how to defend your system. CERT Summaries can be found at

ftp://info.cert.org/pub/cert_summaries/.

Detailed information about how to actually check your system for the signs of intrusion reviewed above can be found at

ftp://info.cert.org/pub/tech_tips/intruder_detection_checklist. The User community at the APS has a group of Computer Protection Representatives who are responsible for maintaining recommended security upgrades and patches for their CAT's operating system(s). If you suspect that your system has been compromised, contact your CAT representative immediately. The CAT Computer Protection Representatives are listed below.

The Advanced Photon Source and Argonne National Lab can offer additional assistance and information through the following Computer Security Representatives:

Mike Eisenberg (mje@aps.anl.gov) or, Laurie Tyzenhaus (latyzenhaus@anl.gov). ↴

CAT Computer Protection Representatives

| | | |
|------------|---------------------------------|--|
| BESSRC-CAT | Guy Jennings Mark Engbretson | guy_jennings@qmgate.anl.gov Engbretson@anl.gov |
| Bio-CAT | Sergey Stepanov | sergey@bio.aps.anl.gov |
| CARS-CAT | Harvey Rarback | rarback@cars3.uchicago.edu |
| CMC-CAT | Arun Bommanavar | arun@anl.gov |
| DND-CAT | John Quintana | jq@nwu.edu |
| IMCA-CAT | Bill Lavender | lavender@sparky.csri.iit.edu |
| IMM-CAT | Alec Sandy | arsandy@mit.edu |
| MHATT-CAT | Ernest Williams | williams@mhattcat.howard.edu |
| MR-CAT | Bill Lavender | lavender@sparky.csri.iit.edu |
| MU-CAT | Doug Robinson | drobinsn@iastate.edu |
| PNC-CAT | Dale Brewe | brew@pnc.aps.anl.gov |
| SBC-CAT | Jack Lazarz | jlazarz@anl.gov |
| SRI-CAT | Dave Wallis | wallis@aps.anl.gov |
| UNI-CAT | Pete Jemian | jemian@unicat.aps.anl.gov |

New ANL Site Access Policies— How they Affect APS Users

Recent changes in the ANL site access policy maintain control over entry onto the grounds yet provide quicker and easier access for the more than 70,000 people who visit ANL each year. The primary policy change focuses on site access for U.S. citizens. Previously, U.S. citizen visitors required a pre-arranged gate pass or a stop at the Argonne Information Center (AIC), located next to the Main Gate, prior to site entry. Now between 6:30 a.m. and 7:00 p.m. Monday-Friday, visitors who are U.S. citizens and have a valid reason for being on site will be allowed through the gates without prior arrangement of a gate pass. Valid reasons may include APS- and Argonne-authorized or sponsored events, conferences, meetings, residency at the Guest House or other on-site housing facilities, dinner reservations at the Guest House, or a family member picking up an employee or User between 6:30 a.m. and 7:00 p.m.

Under the new policy, as before, Argonne Laboratory staff, DOE employees, APS Users, and other frequent site occupants who can display a valid ANL-issued photo-identification badge can enter at any of the Lab's three gates during their hours of operation.

An ANL-issued vehicle decal displayed on a car windshield may be used for site access (at gates in operation) between 6:30 a.m. and 7:00 p.m. Monday-Friday.

APS Users can obtain an APS User badge (which will also be activated for the Cardkey® building access system in use at the APS) by completing the registration and orientation process at the APS User Office. Requests for vehicle stickers for User autos are also handled by the APS User Office. Employees, Users, and other site occupants are responsible for ensuring that any visitors who enter the ANL site with them via the employee's or User's personal vehicle meet the laboratory's requirements for admittance and hosting of guests on site.

A visitor with a valid ANL-issued gate pass may enter the site during the dates and times approved on the gate pass. If a U.S. citizen guest will require access outside of the normal business hours, a gate pass should be arranged in advance through the APS User Office. Contractors visiting the APS site must still obtain a gate pass due to the requirement for safety orientation.

Visitors who are foreign nationals require additional paperwork for site access that must be completed *in advance* of their arrival. Completion and approval of the DOE "Request for Foreign National Unclassified Visit or Assignment" form is needed even if the visitor holds a green card or is a permanent resident. The APS User Office (Bldg. 401, Rm. 1154) can offer assistance in preparing for a foreign visitor. ▴

| <u>ANL GATE:</u> | <u>LOCATION:</u> | <u>HOURS OF OPERATION:</u> |
|----------------------------|-------------------------------------|--|
| North (or Main) Gate | (on Northgate Rd. off Cass Ave.) | 24 hours a day, 7 days a week |
| Westgate | (on Westgate Rd. off Lemont Rd.) | 6:15 a.m.-7:15 p.m. M-F |
| Eastgate | (on Eastwood Dr. off Cass Ave.) | 7:00 a.m.-9:00 a.m. and 4:00 p.m.-6:00 p.m. M-F |

6th International Conference on Biophysics & Synchrotron Radiation

August 4 - 8, 1998 at the Advanced Photon Source, Argonne, IL



- Macromolecular Crystallography
- Non-crystalline X-ray Scattering
 - Hard X-ray, VUV, and IR Spectroscopy
 - Medical Imaging
 - Microscopy
 - Hot Topics
 - “Meet the Experts” Sessions
 - Experimental Apparatus and Techniques
- Comprehensive Poster Sessions and Invited Talks
- Macromolecular Complexes
- Impact of Synchrotron Radiation:
Past, Present, and Future

The 6th International BSR Conference will provide all participants—from graduate students to Nobel Laureates—with state-of-the-art insights and new information about this exciting field.

Visit the conference Web site at <http://www.aps.anl.gov/conferences/bsr> and complete the pre-registration questionnaire to request registration information.

For further information, contact:

Keith Moffat
Chair, Local Organization and Program Committee
773/702-9950
E-mail: moffat@cars.uchicago.edu

Susan Barr Strasser
BSR '98 Conference Office
630/252-5981
E-mail: bsr98@aps.anl.gov

Ninth Users Meeting for the Advanced Photon Source

| October 1998 | | | | | | |
|--------------|------|-----------|-----------|-----------|------|------|
| Sun. | Mon. | Tues. | Wed. | Thur. | Fri. | Sat. |
| | | | | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 |

Oct. 13 -- Full-day User Meeting
Evening Banquet

Oct. 14 -- 1/2-day User Meeting
1/2-day Workshops
APS/USO Business Meeting

Oct. 15 -- Full-day Workshops

1/2-Day Workshops

Introduction to the APS

Microfocusing

1-Day Workshops

Macromolecular Crystallography

Molecular Environmental Science

The meeting will also feature vendor exhibits, poster sessions, social events, and the Research Directorate meeting (Oct. 12). This year's conference banquet will be held at Chicago's sophisticated *Mid-America Club*, which offers spectacular views of Lake Michigan. Watch for additional information about the meeting in upcoming weeks. Complete the pre-registration questionnaire on the meeting Web site at <http://www.aps.anl.gov/conferences/9um> to receive a registration packet when they become available.

Plan to attend the Ninth Users Meeting for the APS this fall!

Attention APS Users!

Did you know that you can access the APS User Database on-line to search for mailing addresses, phone and fax numbers, and e-mail addresses of members of the APS User community?

To help keep the database up-to-date and accurate, the APS User Office requests that all Users check their entries in the database and make any needed corrections or updates. If you find that your name is not currently in the database, it is easy to add your information.

The database can be reached from the APS User Information home page at

<http://www.aps.anl.gov/xfd/ui>

You can use the search function to look up your entry and use the update function to correct or add database entries by completing a simple form that is submitted electronically to the User Office. ▴

APS 1998 Operations Schedule

The Beamline Operations Information page on the WWW maintains up-to-date calendars and schedules for APS operations. The home page at <http://www.aps.anl.gov/xfd/operations/welcome.html> provides links to useful information including the beamline operations schedule for the current operating cycle, the long-range operating calendar, the on-shift Floor Coordinator schedule, schedule archives, and more.

Currently, the operations schedule has been set through September 1998. ↴

| 1998 APS Operations Long-term Schedule | | | | | | | | | | | | | | | | | | | | | |
|--|----|----|----|----|----|----|----------|----|----|----|----|----|----|-----------------------|----|----|----|----|----|----|---|
| January | | | | | | | February | | | | | | | March | | | | | | | |
| M | T | W | T | F | S | S | M | T | W | T | F | S | S | M | T | W | T | F | S | S | |
| | | | 1* | 2 | 3 | 4 | | | | | | | 1 | | | | | | | 1 | |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | |
| 26 | 27 | 28 | 29 | 30 | 31 | 23 | 24 | 25 | 26 | 27 | 28 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | | | |
| | | | | | | | | | | | | | 30 | 31 | | | | | | | |
| April | | | | | | | May | | | | | | | June | | | | | | | |
| M | T | W | T | F | S | S | M | T | W | T | F | S | S | M | T | W | T | F | S | S | |
| | | 1 | 2 | 3 | 4 | 5 | | | | | 1 | 2 | 3 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | |
| 27 | 28 | 29 | 30 | | | | 25* | 26 | 27 | 28 | 29 | 30 | 31 | 29 | 30 | | | | | | |
| July | | | | | | | August | | | | | | | September | | | | | | | |
| M | T | W | T | F | S | S | M | T | W | T | F | S | S | M | T | W | T | F | S | S | |
| | | 1 | 2 | 3* | 4 | 5 | | | | | | 1 | 2 | | | 1 | 2 | 3 | 4 | 5 | 6 |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 7* | 8 | 9 | 10 | 11 | 12 | 13 | |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | |
| 27 | 28 | 29 | 30 | 31 | | | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 28 | 29 | 30 | | | | | |
| | | | | | | | 31 | | | | | | | | | | | | | | |
| User Operations | | | | | | | | | | | | | | Scheduled Maintenance | | | | | | | |
| Start-Up/Machine Studies | | | | | | | | | | | | | | Laboratory Holidays | | | | | | | |
| | | | | | | | | | | | | | | • | | | | | | | |

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