



CAT Communicator

Argonne National Laboratory, Argonne, Illinois 60439

Vol. VIII, No. 3 December 1998

Ninth Users Meeting Held at the APS

The Ninth Users Meeting for the Advanced Photon Source clearly marked a turn in the road for the APS: Results from work conducted at APS beamlines dominated the user science sessions and workshops. In the past, user meeting programs focused primarily on synchrotron radiation research techniques and topics related to beamline design and hardware. In the past 18 months since the Eighth Users Meeting, many APS beamlines have begun to support research, creating a “boom” in the user population (see “Milestones for the APS User Office,” p. 11) and in the quantity and quality of scientific results.

The meeting opened on Tuesday, October 13, with a welcome from Interim Argonne National Laboratory Director Frank Fradin. Fradin credited the ongoing success of the APS project to the hard work of the user community and APS staff. Pat Dehmer, Director of the Office of Basic Energy Sciences, Department of Energy (DOE), followed with the DOE perspective. She congratulated the users on behalf of the DOE for the “spectacular results” coming out of the APS so soon. After briefly reviewing the DOE FY 1999 funding picture, she turned her attention to the area of user safety, stressing the DOE commitment to working safely, and illustrating her remarks with examples from her own research experiences.

David Moncton, Associate Laboratory Director for the APS, continued the opening session with the APS Update. He began by reviewing the status of funding recommendations on DOE synchrotron sources and science from the 1997 Birgeneau-Shen panel. He then addressed the APS operating budget for FY 1999, discussed APS work in the area of fourth-generation sources, briefly reviewed machine performance, and introduced the new paradigm for synchrotron operations: top-up mode.

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David Moncton, Associate Laboratory Director for the APS (far right) and APSUO Chair Jonathan Tischler (far left), congratulate the 1998 Compton Award winners (from second left to right) Donald Bilderback (Cornell High Energy Synchrotron Source), Andreas Freund (European Synchrotron Radiation Facility), Gordon Knapp (X-ray Instrumentation Associates), and Dennis Mills (Experimental Facilities Division / ANL).

Moncton concluded with a brief look ahead, commenting both on the growth of the APS user community and the increased number of requests for new sectors.

Director of the Accelerator Systems Division John Galayda addressed the challenges of top-up operation at the APS in a detailed talk that covered the motivation for top up, operational parameters, concerns, progress, challenges, and future plans.

The opening session concluded on Tuesday morning with the presentation of the third APS Compton Award. The award was presented to Donald H. Bilderback, Andreas K. Freund, Gordon S. Knapp, and Dennis M. Mills (see photo). The award recognized the technical leadership the four winners exhibited in developing cryogenically cooled x-ray optics used to handle the high power density of undulator x-ray beams at third-generation synchrotron sources.

Eight areas of user science were highlighted in the remaining meeting sessions. The first user science session began with an overview talk by Steve Sutton (The University of Chicago), who highlighted the new opportunities at the APS for geochemical analyses on complex and microscale

samples. Derrick Mancini (Experimental Facilities Division, ANL) followed with a thorough description of the technique of deep x-ray lithography for micromachining. Andrzej Joachimiak (Structural Biology Center, ANL) continued the session with a description of the SBC-CAT's beamline

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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.

APS Users Active in Recent Meetings

Six recent international conferences and workshops gave APS researchers and staff an opportunity to participate in a diverse array of scientific forums. Although the scientific focus of each meeting was unique, these locally held meetings shared common goals of disseminating the latest technical insights and stimulating interaction between members of their scientific communities. *CAT Communicator* has collected the following conference and workshop summaries:

More than 300 people braved days of rainy Chicago weather to attend the **Sixth International Conference on Biophysics and Synchrotron Radiation (6BSR)**. Eighteen countries were represented at the conference, which was chaired by Keith Moffat from The University of Chicago. The meeting was held August 4-8, 1998, in the APS Conference



A 6BSR participant dodges the rain to enjoy lunch under the tent.

Center at Argonne National Laboratory, and encompassed 12 sequential sessions, including two poster sessions and a mini-symposium. Presentations by the 61 invited speakers ranged from overview talks to detailed descriptions of current work, and the session topics included macromolecular crystallography; optics, apparatus and special techniques; scattering from non-crystalline systems; microscopies and medical research; x-ray, VUV, and IR spectroscopies; and the frontier with cell biology. The conference topics covered the length scale from angstroms (biomolecular structure) to tens of centimeters (imaging of coronary arteries), and the time scale from nanoseconds (time-resolved crystallography) to days (biological generation times). In addition, a morning symposium entitled "Impact of Synchrotron Radiation on Biology and Biophysics: Past, Present, and Future," addressed the history of the field, the current impact on biotechnology, and prospects for the future, including the potential impact of fourth-generation x-ray sources. (In fact, the symposium led to an impromptu wide-ranging evening discussion on the future of this diverse and rapidly growing field.)

Also included in the program were informal "Meet the Experts" sessions, held on two evenings in the Argonne Guest House dining room. These well-attended sessions covered MAD phasing, cryocrystallography, small-angle scattering, detectors, time-resolved crystallography, imaging, macromolecular complexes, biological spectroscopies, and access to synchrotrons. Experts for these sessions were selected just a few days earlier, and participants were encouraged to sit in on one (or more) sessions as their particular interests dictated.

Another well-attended evening session was the "Hot Topics" awards and talks. Eight individuals received \$500 cash awards and were invited to present their work. The award winners were selected from poster abstracts submitted by graduate students or post-

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APS Users Active...Continued from p. 3

doctoral appointees by a “blue-ribbon” committee consisting of Johann Deisenhofer, Hugh Huxley, and Janet Smith. The awards, funded by the International Union of Crystallography, were instituted as a means of encouraging attendance at the meeting by young investigators.

Social events included a preconference reception at the Argonne Guest House, where participants had a chance to greet colleagues and meet new friends, and a Friday night banquet at Chicago’s Field Museum of Natural History. At the museum, participants were able to tour various exhibits, including the laboratory where “Sue,” the largest and most complete *Tyrannosaurus rex* ever found, is being prepared.



Wayne Hendrickson (L) and David Moncton (R) enjoy a conversation during a break at 6BSR.

Although no formal meeting proceedings are being published, interested individuals will be able access abstracts of the invited talks on the conference Web page at <http://www.aps.anl.gov/conferences/bsr/bsr98.html>. Copies of the poster abstract book can be obtained from the APS User Office.

We announce with great regret the death of Per Spanne, from ESRF and NSLS, a prominent speaker at this conference, in the crash of Swissair Flight 111.

Immediately following 6BSR, a **Biophysics Collaborative Access Team (Bio-CAT)-sponsored Workshop** was held Saturday afternoon, August 8th. More than 30 people attended the workshop and the reception that followed. Topics presented and discussed by attendees included the scope of Bio-CAT, beamline design and performance, and ancillary instrumentation such as the multilayer analyzer for XAFS. Although the Bio-CAT facility is not officially operational, researchers with potentially high-impact or innovative experiments are invited to contact either Bruce Bunker (bunker@biocat1.iit.edu) or Tom Irving (irving@biocat1.iit.edu) regarding possibilities for future experiments. For more information see the Bio-CAT Web site at <http://biocat1.iit.edu/>.

The **Workshop on Needs for a Photon Spectroscopy Theory Center**, sponsored by the DOE, was also held at the APS on Saturday, August 8. The workshop summarized the needs for and developed a preliminary plan for a Photon Spectroscopy Theory Center. A theory center could be used to improve the scientific productivity of synchrotron light sources by advancing the basic understanding of photon–matter interactions, developing efficient theoretical methods and computer codes to calculate photon–matter interactions, and developing efficient scientific analysis tools that could use theory to simulate and interpret experiments. A total of 35 theory and experiment specialists (including 18

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Meet New APS Floor Coordinators

Five new members of the Experiment Floor Operations Group (EFOG) have joined the APS during the summer and fall of 1998, bringing the total number of floor coordinators to 13. David VanWingeren joined EFOG on June 15, 1998. He is a recent graduate of Greenville College in downstate Greenville, Illinois, where he earned a B.A. in chemistry and physics. A native of Carlinville, Illinois, David enjoys playing tennis and riding his bicycle. He will be working with users in sectors 5-8 with fellow Floor Coordinator Kevin Beyer.

Craig Dean holds a B.S. in physics, as well as a B.S. in mathematics, from Southern Polytechnic University in Marietta, Georgia. He joined EFOG on July 13, 1998, and has been working with Bill Wesolowski, APS floor coordinator, to provide technical user support to sectors 9-12. Craig has 10

years of service (both active duty and reserves time) in Military Intelligence with the U.S. Army. He spent three years as a security procedural analyst for Arko Executive Services. While in college, he worked as laboratory director for the International Studies Language Laboratory and as assistant to the laboratory director for the Physics Department at Southern Polytechnic University.

Dan LaBrier joined the group August 3, 1998. Dan comes to the APS after earning a B.S. in physics from Illinois State University and an M.S. in physics from Indiana State University. His academic interests include computational stellar modeling, theoretical nuclear physics, and teaching at the collegiate level. Dan will work on a daily basis to facilitate beamline operations and provide technical support to sectors 32-34. Outside of the APS, Dan enjoys playing and watching baseball and football, listening to and composing music, and exploring the Chicagoland area.

Wendy Lanham joined EFOG on October 19, 1998. She is a recent graduate of Northern Illinois University where she received a B.S. in biology. She also has an Associate in Arts from Joliet Junior College. Wendy is currently providing assistance to the user community in sectors 32-34.

Nena Velampampil, the newest APS floor coordinator, joined

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New members of the Experiment Floor Operations Group will be providing technical support to the user community. Shown L to R: Dan LaBrier, David VanWingeren, and Craig Dean.

Using Radioactive Materials in Experiments at the APS

When APS users need to use radionuclides in the course of their research, they begin the process by contacting their CAT management and completing an Experiment Safety Approval (ESA) Form. Most samples and materials are obtained from the user's home institution. Critical information about the sample(s) and the experiment must be communicated to both the CAT and the APS, including isotopic composition, mass of isotope per sample, physical form of the sample, beam conditions for the experiment, and the encapsulation and assembly method. The encapsulation process must be proven to be sound prior to the actual conduct of any experiment. Additionally, the intended shipment and return dates for the sample(s), as well as the duration of the experiment, should be determined. The APS must approve the experiment protocol, and the CAT must approve the ESA form.

The use of *all* radioactive nuclides at the APS is subject to the mass accountability and reporting requirements of the Department of Energy (DOE), which Argonne-East has adopted. All radioactive materials (except sealed sources) brought to the APS are required by the DOE to be tracked, and there is a capacity limit set for the amount of radioactive material that can be at the APS site at any given time. Accurate accounting and tracking are critical; in the event the APS ever got close to reaching the capacity limit, the influx of radioactive materials would have to be scheduled to balance with the outflow of materials to ensure that the limit of on-site materials is never exceeded. A separate administrative level of accounting, a Materials Balance Area (MBA), focuses solely on 17 accountable nuclear materials as identified by the DOE (see Table 1). If the quantity limit for

total radioactive nuclides was ever exceeded, the APS would be declared a nuclear facility, which would have serious and wide-ranging ramifications for both the APS and Argonne.

The APS has established an MBA, opening up new avenues of research which include

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Table 1

MBA ACCOUNTABLE NUCLEAR MATERIALS			
MATERIAL TYPE	SPECIAL NUCLEAR MATERIAL	SOURCE MATERIAL	OTHER NUCLEAR
Depleted Uranium*		X	
Enriched Uranium*	X		
Normal Uranium*		X	
Uranium 233	X		
Plutonium 242*	X		
Plutonium 239-241*	X		
Plutonium 238	X		
Americium 241*			X
Americium 243*			X
Berkelium			X
Californium 252			X
Curium*			X
Deuterium			X
Lithium 6			X
Neptunium 237*			X
Thorium*		X	
Tritium			X

* The APS currently has authorization to receive and use these nuclear materials. The other nuclear materials can be added to the APS' authorization by request.

Radioactive...Continued from p. 6

PRIMER OF DEFINITIONS	
CLASS OF MATERIALS	DEFINITION
SOURCE MATERIALS	Any materials (except Special Nuclear Materials) that contain ≥ 0.05 wt. % of Uranium that is ≤ 0.7115 wt. % ^{235}U , or Thorium, or a combination of these.
SPECIAL NUCLEAR MATERIALS	Weapons grade materials as defined by DOE.
FISSIONABLE MATERIALS	Nuclides capable of sustaining a neutron-induced fission chain reaction (e.g., ^{233}U , ^{235}U , ^{238}Pu , ^{239}Pu , ^{241}Pu , ^{237}Np , ^{241}Am , and ^{244}Cm).
REACTOR MATERIALS	Materials approved for research and development and for use in reactors. Heavy water, D_2O , is the only reactor material considered accountable at ANL.

the accountable nuclear materials (e.g., actinides). The MBA at the APS is a precisely defined geographic area (currently including sectors 9-16) whose boundaries are set as a part of the Laboratory's Material Control and Accountability Plan. The APS is working to incorporate all sectors on the experiment hall floor into MBAs.

An MBA comprises several interrelated activities including control (e.g., acquisition and transportation), accountability (e.g., inventory management and record keeping), safeguarding (e.g., storage and enforcement of policies), and reporting of the 17 accountable nuclear materials. Nuclear materials is a collective term that includes source materials, special nuclear materials, and other nuclear materials that the DOE has designated as accountable (see the Primer for definitions). These are the materials tracked by the MBA accounting system. Floor Coordinator Frank Bellinger is the Nuclear Material Custodian for the area at the APS and is responsible for its administrative control. Frank's training and past experience in the area of nuclear materials handling make him an excellent resource. Floor Coordinator Derek Lacey serves as the alternate custodian when Frank is not on-site at the APS.

Argonne's Special Materials Group manages all sample shipments of radioactive materials. Staff from Special Materials contact the user's home institution to clarify packaging

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Looking for employment opportunities in synchrotron radiation research?

Positions for post docs, beamline staff, and other synchrotron-related employment (both at the APS and other locations) are posted on the Employment Opportunities WWW page at

<http://www.aps.anl.gov/apsuo/employment/opp.html>

Each listing includes a job description, prerequisites, and contact information. To post a position, please submit a complete description to the APS User Office (see contact information at the back of this newsletter).

This Web page is sponsored by the Advanced Photon Source Users' Organization.

APS Users Active...*Continued from p. 4*

invited speakers) representing academic, national laboratory, and industrial research institutions attended the workshop. Approximately 20% of the attendees were from abroad, coming from England, Germany, Japan, and Mexico.

Workshop participants unanimously agreed on the need for a center devoted to theory, modeling, and analysis as a logical companion to the nation's photon sources. The invited presentations (many of which are available on the WWW) discussed topics that a "virtual" (connected globally via the Internet) theory center could address. The panel and summary sessions of the meeting identified a number of research topics important for advances in interpreting synchrotron radiation experiments that could be addressed by a theory center (e.g., improved and on-line data analysis tools and improved potentials and phase shifts for all spectroscopies, etc.). Detailed information about the workshop findings and presentations can be found at

<http://www.phys.washington.edu/%7Ejjr/apsworkshop/>.

Also sponsored by the DOE, the **Tenth International Conference on X-ray Absorption Fine Structures (XAFS 10)** was held at the Illinois Institute of Technology Main Campus in downtown Chicago on August 10-14, 1998. Approximately 360 scientists from 23 different countries attended the conference. A program of 467 abstracts was presented during invited plenary and parallel sessions, and contributed poster sessions were devoted to the use of x-ray absorption fine structure spectroscopy for scientific research. In addition, various poster contests for young scientists were sponsored by the International Union of Crystallography and the International XAFS Society.

On Wednesday evening, August 12, attendees and guests were able to see the Chicago skyline from the waters of Lake Michigan during the conference banquet, which was held on the *Spirit of Chicago*, a tour boat with the largest deck space among the Chicago cruise lines. Entertainment included a live band and a musical review show. An upcoming edition of *Synchrotron Radiation News* will feature some of your favorite synchrotron scientists enjoying the evening festivities.

Buses provided by the APS transported almost one third of the conference attendees to the APS for afternoon tours of the facilities on Friday, August 14. With the help of 13 volunteer tour guides and assistance from the APS User Office, the XAFS 10 visitors were able to see first-hand why the APS is commonly referred to as the "Jewel of the Department of Energy." Many positive comments were received from the tour participants about the quality of the science being performed at the APS, the professionalism of the staff, and the quality of the facility.

The **19th International Linear Accelerator Conference (LINAC98)** was held in Chicago on August 23-28, 1998. The conference was organized by Argonne National Laboratory in association with Fermi National Accelerator Laboratory. The conferences are held biannually and bring together linear accelerator experts from around the world for a week of extensive information exchange.

This year's conference was attended by 399 invitation-only participants. The 44 invited speakers addressed the scientific and technical aspects of linear accelerator operation and design, as well as industrial applications. The major topics presented at this

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(Shown L to R) Yanglai Cho (Deputy to the Associate Laboratory Director / APS), Joan Fradin, Frank Fradin (Interim Laboratory Director for Argonne National Laboratory), Lowell Bollinger (Senior Physicist), and Richard Pardo (Operations Manager / ATLAS) relax at Ravinia before the concert.

year's conference included invited papers on linac-based fourth-generation light sources, linear collider studies based on room temperature and cryogenic rf technologies, high-power proton accelerators for neutron generation and material transmutation, and radioactive particle-beam generations for nuclear physics studies. The mid-conference break included a luncheon outing to the Chicago Botanic Garden followed by dinner and a Chicago Symphony Orchestra concert at Ravinia.

The local organizing staff included personnel from the APS, IPNS, and Physics Division along with personnel from Argonne's Conference Services. The conference and its international organizing committee were chaired by Yanglai Cho of the APS. Gerald McMichael of IPNS chaired the program committee.

During the conference, editorial staff drawn from the APS and elsewhere processed more than 400 manuscripts on-site at the meeting. The electronic version of the proceedings is now available on the LINAC98 Web site at <http://www.aps.anl.gov/conferences/LINAC98/>.

The **Applications of Polarized X-rays Workshop**, held September 28-29, 1998, at the APS, brought together members of the international community from a wide variety of scientific disciplines to stimulate discussion and foster collaboration for the new facilities emerging on APS sector 4. SRI-CAT personnel are developing this sector to provide both hard and soft x-ray beams with variable polarization (linear and circular) for application to problems in a variety of fields (e.g., materials science, chemistry, condensed matter physics, etc.) beginning in the year 2000.

More than 100 people came to hear 14 internationally recognized speakers invited by workshop Chairs Efim Gluskin and George Srajer. Topics presented included studies of magnetic materials with hard and soft x-ray resonant magnetic scattering techniques, gas phase studies of molecules, application of high magnetic fields in the materials sciences, problems of interest in correlated systems and magnetic materials, and spin polarized photoemission with polarized soft x-rays. In addition, there were five short talks on various topics related to the use of polarized x-rays to explore specific scientific problems.

The workshop concluded with a panel discussion which made it clear that the variable polarization capabilities of sector 4 will provide the user community with the capacity to perform experiments not possible elsewhere. For further information regarding the facilities in sector 4, contact John Freeland (freeland@aps.anl.gov) or George Srajer (srajerg@aps.anl.gov). ▽

1999 CAT Calendar

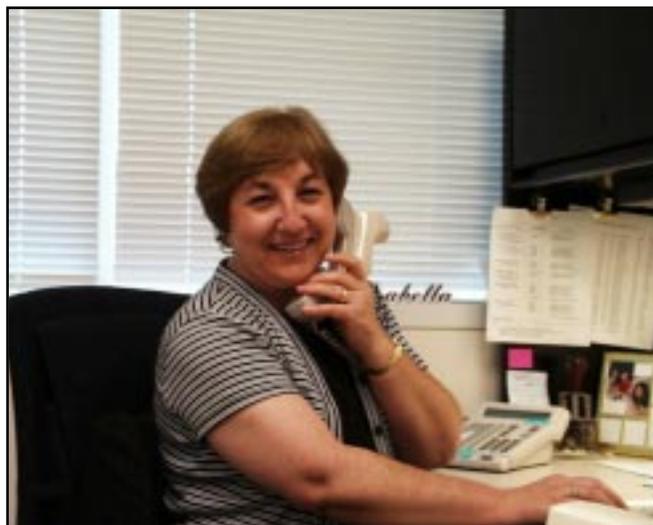
Date	Event
January 12-14, 1999	Workshop on Scientific Applications of the LCLS, Stanford, CA
January 22, 1999	Combined Research Directorate Meeting and APSUO Steering Committee Meeting
February 18-19, 1999	Program Evaluation Board
March 20-26, 1999	The American Physical Society 1999 Centennial Meeting, Atlanta, GA
April 6-9, 1999	ICFA Beam Dynamics Panel Workshop on Future Light Sources, Argonne, IL
April 15, 1999	APSUO Steering Committee Meeting
April 16, 1999	Research Directorate Meeting
July 7, 1999	Research Directorate Meeting
July 8, 1999	APSUO Steering Committee Meeting
August 23-27, 1999	18 th International Conference on X-ray and Inner-Shell Processes, Chicago, IL
August 23-26, 1999	21 st International Free Electron Laser Conference and 6 th FEL Applications Workshop, Hamburg, Germany
October 13-15, 1999	11 th National Conference on Synchrotron Radiation Instrumentation, Stanford, CA
October 28, 1999	APSUO Steering Committee Meeting
October 29, 1999	Research Directorate Meeting

New APSUO Steering Committee Members Elected

Six new APS User Organization (APSUO) Steering Committee members were elected by the user community at the APSUO Business Meeting held during the recent Ninth Users Meeting for the APS. The new members include Mark Antonio (BESSRC-CAT), Dean Chapman (MR-CAT), Paul Fenter (BESSRC-CAT), Steve Heald (PNC-CAT), Wilfried Schildkamp (CARS-CAT), and Paul Zschack (UNI-CAT). Steve Dierker (MHATT-CAT) has assumed the role of committee chair, replacing Jon Tischler (UNI-CAT) who will remain on the committee as an *ex officio* member. Thank you to the retiring committee members, Mark Beno (BESSRC-CAT), Bob Bubeck (DND-CAT), Lynda Soderholm (BESSRC-CAT), Mark Sutton (IMM-CAT), and Steve Sutton (CARS-CAT), for their hard work and effort. ⚡

Meet Isabella Krashak

Isabella Krashak started at Argonne National Laboratory in September 1992, as a member of the Argonne Resource Pool. She has worked at many different offices and divisions throughout Argonne including the Information Center, Mathematics & Computer Science, Plant Facilities & Services, Information & Publishing Division, Technology Development Division, Chemistry, and Chemical Technology. The largest portion of her time was spent providing secretarial support in the Accelerator Systems Division (including a one-year term position).



Isabella's office is located in Building 401, Room B1154B.

Isabella joined the APS User Office in the Experimental Facilities Division on June 3, 1998, in a full-time position as secretary. Her primary responsibilities include conducting orientations for new APS users, distributing and tracking film badges, answering phones, and assisting with other User Office activities. ↴

Milestones for the APS User Office



Diane Sandberg (R) and Yizhi Tao (L) in the APS User Office Training Room. Ms. Tao became the 1000th user to complete the APS user orientation process. Ms. Tao was presented with an APS mug and sweatshirt to mark the occasion.

The APS User Office reached a milestone on Monday, June 29, 1998: Yizhi Tao from Purdue University's Biological Sciences Department completed the orientation process, becoming the APS' 1000th user. Ms. Tao came to the APS as a collaborator to work at CARS-CAT. Diane Sandberg from the APS User Office presented Ms. Tao with an APS coffee mug and sweatshirt to commemorate the occasion.

From a total of 35 in 1994, the number of APS user orientation sessions conducted has grown steadily to its current level of 1313 (as of November 30, 1998, see graph next page). The User Office has tailored and streamlined the orientation process to better meet the needs of incoming researchers and students. The on-line Argonne/APS introduction and Personnel Safety System

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Milestones...Continued from p. 11

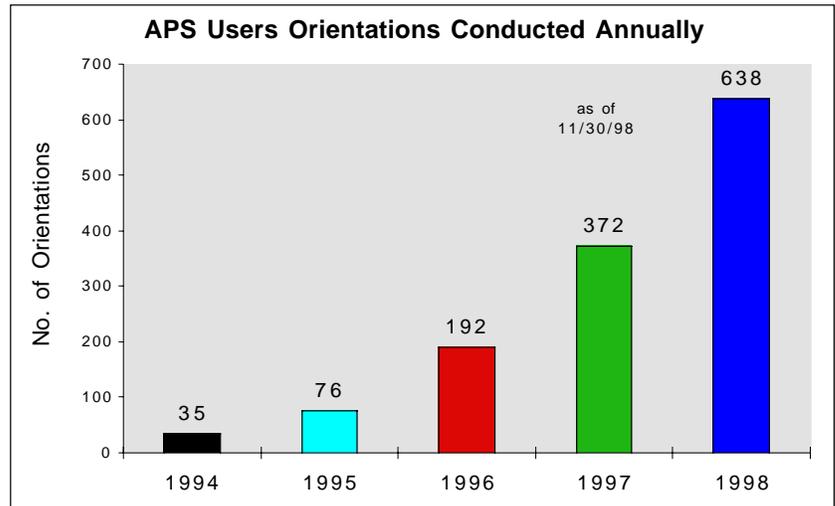


Diane Sandberg uses the Cardkey® system to generate Dave Blanchard's APS user badge.

overview (along with General Employee Radiation Training, if needed) and administrative processing now take only on the average of an hour to complete.

To further expedite the orientation process, the User Office has been granted permission from the Department of Energy to produce and issue APS user Cardkey® badges. This capability saves users a separate trip to the Argonne security office to have their photo I.D. badge made. The first user photographed at the User Office was Dave L. Blanchard, Jr., from Pacific Northwest National Laboratory who came to work with PNC-CAT. ⚡

Between 1994 and 1998, the APS User Office has seen rapid growth in the rate of users coming to the APS. Typically, the number of orientations conducted rises during user operations periods and falls off during maintenance periods. Orientations are computer-based and are administered in the training room across the hallway from the User Office.



What Are All Those Users Doing??

During fiscal year 1998, the APS user community conducted a total of 734 experiments. These experiments spanned a broad range of scientific disciplines as shown below.

253	Biological and life sciences (excluding medical applications)	30	Earth sciences
200	Materials sciences (including condensed-matter physics and materials chemistry)	25	Physics (excluding condensed-matter physics)
75	Instrumentation and technique development	19	Environmental sciences
49	Chemistry (excluding materials chemistry)	17	Polymers
45	Optics	17	Medical applications
		3	Other

APS Clothing Is Available!

The APS Spectrum Club is selling Advanced Photon Source/Argonne National Laboratory denim caps, sweatshirts, and T-shirts with the APS spectrum logo on them.

- ⇒ **Denim caps** have a seven-color embroidered spectrum logo on the front and a choice of navy or khaki suede brims. \$12
- ⇒ **Sweatshirts** (sizes M and L) are a classic gray color, made of durable 50/50 cotton/polyester, and have the embroidered logo on the front. \$20
- ⇒ **T-shirts** with silkscreened designs have the APS spectrum logo on the front and a plan view of the APS ring--including all CAT names--on the back. \$10 ↴



The APS/Argonne National Laboratory clothing is available for purchase. Contact the APS User Office for an order form. Payments can be made by cash or check.

APS Holiday Luncheon

Sponsored by the APS Spectrum Club

Dear Users—You are invited!

Date:

Friday, December 18th

Time:

11:30 a.m. Social hour

12:00 noon Buffet-style lunch

Location:

Argonne Guest House

Cost:

\$10.00 per person

Many raffle prizes will be given away!

Stop by the User Office, building 401, room B1154, to sign up!

Menu:

- freshly baked luncheon rolls & butter
- caesar salad, hearts of palm and artichoke salad, tomato feta salad with roasted garlic vin
- braised bone-in chicken with onions and mushrooms
- sauteed spaetzle with sage and garlic
- tortilla with tomato tarragon sauce
- dessert table with Christmas cookies and cakes
- freshly brewed coffee, decaffeinated coffee, premium herbal tea selection, and an assortment of soft drinks! ↴



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and labeling requirements, supply the proper shipping address, and provide an authorization number for the shipment. When the material arrives at Argonne, the Special Materials Group assigns it a batch number for tracking purposes. The APS Nuclear Materials Custodian, Frank Bellinger, is then notified that the material has arrived, and the material is transferred to the APS. If the APS has not been made fully aware of an incoming shipment of radioactive material, it may refuse the shipment (which will then be returned).

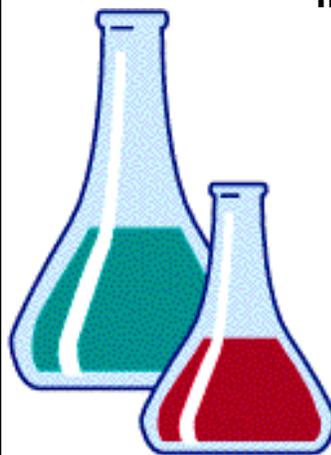
Once delivered to the APS, the sample(s) is stored in a safe. A tracking and record-keeping process is used to document all movement and use of the sample(s). The APS provides the experimenter with a procedural document that is posted on the hutch door that outlines activities connected with the use of the sample(s). The procedure includes activities such as Health Physics surveys, a list of persons authorized to handle the material(s), a list of emergency contacts, etc. When the experiment is complete, the material(s) is removed from the experiment floor and returned to the safe by the MBA custodian. The Special Materials Group will handle the return shipment of the material(s) when the experiment is completed.

The use of radionuclides in experiments at the APS should be planned out as far in advance as possible. The APS and the Special Materials Group can provide excellent technical support to make the acquisition, storage, use, and return of radionuclide samples safe and straightforward. Anyone with questions regarding the use of radionuclides in experiments at the APS should contact Bruce Glagola, division nuclear materials contact, at ext. 2-9797 or by e-mail at glagola@aps.anl.gov.

TWG Welcomes New Chair and Vice Chair

The InterCAT Technical Working Group (TWG) welcomed Paul Zschack (DND-CAT) as the new chair and Steve Heald (PNC-CAT) as the new vice chair of the group. The TWG typically meets on the third Thursday of each month to discuss technical issues of interest to the CATs. To receive e-mail announcements on upcoming meetings and information about current TWG topics, see <http://www.aps.anl.gov/cats/twg.html> to have your name added to the listserver. ↴

Reminder to All APS Users



If you plan to bring samples and/or chemicals to the APS from your home institution to conduct your experiment(s), you must inform your host CAT before you travel to the APS.

Your host CAT can provide important safety information and guidance that can help you make the most efficient use of your beam time.

Some commonly used chemicals are available in the APS stockroom.

Not sure whom to call?
Contact the APS User Office at 2-9090 and we'll put you in touch with appropriate CAT personnel. ↴

Small Quantity Transportation Exceptions Now Available

Are you a collaborator or student coming to the APS to conduct an experiment? Will you need samples and/or materials from your home institution to conduct your research? Safe and lawful transportation of small quantities of certain hazardous materials to and from the APS recently became easier: The Experimental Facilities Division requested and received a modification of Argonne National Laboratory's hazardous material (HazMat) transportation policy. The modification allows on-site ground transport, in user vehicles (including rental or other user-driven vehicles), of small quantities of qualifying, non-radioactive materials to and from APS user facilities providing that they are transported in full accordance with Department of Transportation (DOT) regulations.

To comply with DOT regulations, you must correctly identify materials and their potential hazards. The Experiment Safety Approval Form is an excellent starting point for identifying hazardous materials you might need to transport to and from the APS. Each CAT has a trained member that can assist in identify-

ing hazardous materials and offer guidance for safe packaging and transportation. The DOT has established nine hazard classes, some of which are further subdivided into divisions. A straightforward table in the regulations can be used to look up a chemical (or class of chemicals) alphabetically and determine its hazard class(es) or division(s). Once the class or division is known, the amount below which a shipment would be considered a "small quantity" can be determined. Some classes and divisions are further characterized by packing group designations I, II, or III, which indicate the degree of danger presented by the material (I being the most dangerous). Qualifying

materials and their quantity limits that may be ground transported to and from the APS by users are summarized in Table 1. Contact your host CAT to speak with the CAT member trained in small-quantity HazMat transportation for assistance.

Radioactive materials (with specific activity greater than 2 nanocuries/gram, as defined for transportation purposes) transported to and from the APS must still be handled ac-

Table 1

QUALIFYING MATERIALS FOR SMALL QUANTITY EXCEPTIONS			
DOT CLASS OR DIVISION	NAME OF CLASS OR DIVISION	MAXIMUM AMOUNT PER CONTAINER (G OR ML)	EXAMPLE CHEMICAL
Class 3	Flammable/combustible liquid	30	Benzene
Division 4.1	Flammable solid	30	Magnesium
Division 4.2 (packing groups II & III)	Spontaneous combustible material	30	Potassium hydrosulfite
Division 4.3 (packing groups II & III)	Dangerous when wet material	30	Alkali metal amides
Division 5.1	Oxidizer	30	Inorganic hypochlorites
Division 5.2	Organic peroxide	30	Benzoyl peroxide
Division 6.1 (packing group I)	Poisonous material	1	Cyanogen bromide
Division 6.1 (packing groups II & III)	Poisonous material	30	Carbon tetrachloride
Class 8	Corrosive material	30	Acetic anhydride
Class 9	Miscellaneous hazardous material	30	PCBs

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Small Quantity...*Continued from p. 15*

According to the original Argonne requirements, which include receipt of materials at building 5, on-site transfers by the ANL Special Materials Handling Group, and off-site shipment by Argonne Plant Facilities and Services. Several classes of materials are not covered by Argonne's Small Quantity Exceptions policy, and cannot be transported by APS users in personal vehicles in any quantity under any circumstances. These materials are listed in Table 2. Materials that are synthesized on site and have unknown hazards or hazards that are different from the original reactants must be evaluated by trained HazMat personnel before being transported off site.

Proper packaging is an important aspect of conforming to DOT regulations. Packaging of HazMat shipments must be done with materials designed to prevent breaking and leaking during transport. Performance specifications of packaging include transporting materials with different hazard classifications (e.g., corrosive, poisonous, or flammable) in *separate* packages (i.e., only one hazard classification per package). Each container has a maximum allowable gram weight (for solids) or milliliter volume (for liquids) limit. These limits are summarized for qualifying materials in Table 1. Each package must be labeled with "This package conforms to 49 CFR 173.4." Specific information about packaging requirements can be obtained from the CAT Safety Coordinator or from APS safety personnel. Plans have been made to make standard packaging available to users in the APS stockroom that will meet DOT requirements.

APS users must be aware that there are additional, significant restrictions and requirements that apply to transporting

Table 2

MATERIALS NOT COVERED BY SMALL QUANTITY EXCEPTIONS	
All divisions of explosives and detonating devices	DOT Class 1
All flammable gases All non-flammable, compressed gases All poisonous gases	DOT Class 2
Spontaneously combustible materials (packing group I)	DOT Division 4.2
Dangerous-when-wet materials (packing group 1)	DOT Division 4.3
Infectious agents	DOT Division 6.2
Radioactive materials	DOT Division 7

any quantity of hazardous material by air or other common carriers. The scope of the application of the small quantity exceptions to the Argonne transportation policy does not cover or apply to air transportation.

Users are encouraged to minimize their transportation of small-quantity hazardous materials to and from Argonne and to take advantage of common reagents available in the APS Stockroom. Argonne-provided shipping, receiving, and on-site transportation services, shipping resources at user home institutions, and commercial shipping services should be used whenever possible to ensure proper transportation of all HazMat materials. Users can take advantage of periodic HazMat training courses offered by Argonne and the APS. The courses cover HazMat transportation regulations, identification of hazardous materials, and information about packaging requirements. For additional information, contact Steve Davey, User Technical Interface Group, ext. 2-5311, e-mail at scd@aps.anl.gov. ▸

Meet ...Continued from p. 5

the group October 26, 1998, and is currently working with Frank Bellinger to provide technical user support to sectors 17-20. She has a B.S. in biology from Illinois Wesleyan University in Bloomington, Illinois, and a M.S. in molecular biology from Illinois State University. Nena has previously worked as a pathology laboratory assistant at Ciba-Geigy Agricultural Company. While in college, she worked as a teaching assistant and taught microbiology for biology majors. ▸



Nena Velamparampil (left) and Wendy Lanham (right) are the latest additions to EFOG.

Top-up Test Conducted

The first top-up mode test with user participation was conducted during machine studies on November 11, 1998. The test was conducted in three parts. The first part was designed to provide a baseline for the succeeding tests. The beam was stored and the beamline shutters opened. As the beam decayed normally, users were able to establish a baseline. The second part consisted of pulsing the injection magnets at a 2-Hz rate, allowing users to investigate the perturbation of the stored beam. After all of the storage ring interlocks required by top-up were satisfied, *with the beamline shutters open*, injection was started at a rate to top-up the stored current from 77 mA to the desired 95 mA in approximately two minutes. The final part of the test began with top-up injection pulses occurring approximately 60 seconds apart to maintain the stored beam current within a factor of 10^{-3} of the 95-mA setpoint. This stability was maintained for the remaining two hours of the test.

A total of 18 beamlines participated during this test. A significant amount of data was gathered by both the users and accelerator physics personnel. Results of the test are currently being analyzed. Further tests are also planned for the near future. ▸



Pedestrians and Vehicles: Sharing the Experiment Hall Floor

Pedestrians on the experiment hall floor share the walk/travel ways with a wide variety of moving and motorized vehicles. Users and visitors must use caution when crossing over the main travel aisle between the laboratory/office modules and the beamline areas. Forklifts, scissorlifts, tricycles, motorized small-delivery carts, construction equipment, and hand trucks frequently travel the aisle and may not be able to maneuver quickly enough to avoid pedestrians stepping out into the aisle. Prevent accidents by stepping onto the walkway slowly and checking in both directions before walking across. ▸

Ninth Users Meeting...Continued from p. 2

capabilities and highlights of recent results, including more than 500 data sets collected in the past nine months, and more than 50 structures solved. Russell Hemley (Carnegie Institute) concluded the afternoon talks by highlighting the opportunities to examine the behavior of materials at multi-megabar pressures made possible by APS radiation in combination with diamond-anvil-cell technologies.

The traditional conference reception and banquet was held Tuesday evening in downtown Chicago at the elegant Mid-America Club. On the 80th floor atop the Amoco Building, meeting attendees enjoyed marvelous views of the city and lakefront in all four directions. The weather cooperated, allowing clear viewing of the sunset and the city lights (see photo at right).

Osnat Herzberg (University of Maryland Biotechnology Institute) led off the second user science session on Wednesday morning by looking at APS as an acronym for "All Protein Structures," describing how genome project information and APS crystallography data can be coordinated to achieve structure/function correlation. Dean Chapman (Illinois Institute of Technology) followed by describing the technique of diffraction-enhanced imaging and its potential medical applications in radiology. Peter Abbamonte (University of Illinois) shifted gears in his talk on x-ray Raman scattering from correlated electron systems and its use as a competitive probe of modern materials. Amit Malik (Materials Science Division, ANL) concluded the morning session by describing a new tool, x-ray intensity fluctuation spectroscopy, for characterizing the time evolution of materials microstructure. The morning session concluded with an announcement of the newly elected members to the APS Users Organization Steering Committee (see related story on p. 10).

Six workshops (both half- and full-day) were



Ninth Users Meeting banquet attendees enjoyed lovely views of Chicago's city lights!

held Wednesday, October 14, through Thursday, October 15. The workshops included "Introduction to the Advanced Photon Source," organized by Dennis Mills; "Structural and Functional Biology," organized by Cele Abad-Zapatero and Grant Bunker; "Microbeams: Techniques and Applications," organized by Eric Isaacs, Barry Lai, Cyrus Safinya, and Steve Pratt; "Industrial R&D with Synchrotron Radiation," organized by Steve Wasserman, Kevin D'Amico, and Bob Bubeck; "Microscale and Molecular Environmental Science," organized by Lynda Soderholm and Steve Sutton; and "Optics Metrology and Fabrication Workshop for APS Users," organized by Al Macrander.

Attendees at the Ninth Users Meeting represented more than 30 corporations, more than 30 U.S. and foreign universities, and 15 national and international laboratories and research facilities. The vendor exhibit comprised 29 organizations (including three Argonne service groups). Proceedings can be obtained by contacting the APS User Office at 2-9090. The Tenth Users Meeting for the APS will be held in April of the year 2000. ▽

APS 1998-1999 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.

This schedule represents the most up-to-date information available at printing time. ↴

December						
M	T	W	Th	F	Sat.	Sun.
	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*			

January						
M	T	W	Th	F	Sat.	Sun.
				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

February						
M	T	W	Th	F	Sat.	Sun.
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

March						
M	T	W	Th	F	Sat.	Sun.
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				

April						
M	T	W	Th	F	Sat.	Sun.
			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**		

May						
M	T	W	Th	F	Sat.	Sun.
					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*						

Key			
	Start Up/Machine Studies	*	Laboratory Holiday
	Scheduled Maintenance	**	ANL Open House Schedule subject to change
	User Operations		

To find out the latest schedule for the Argonne National Laboratory Open House Event, please contact the APS User Office at extension 2-9090. ↴

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