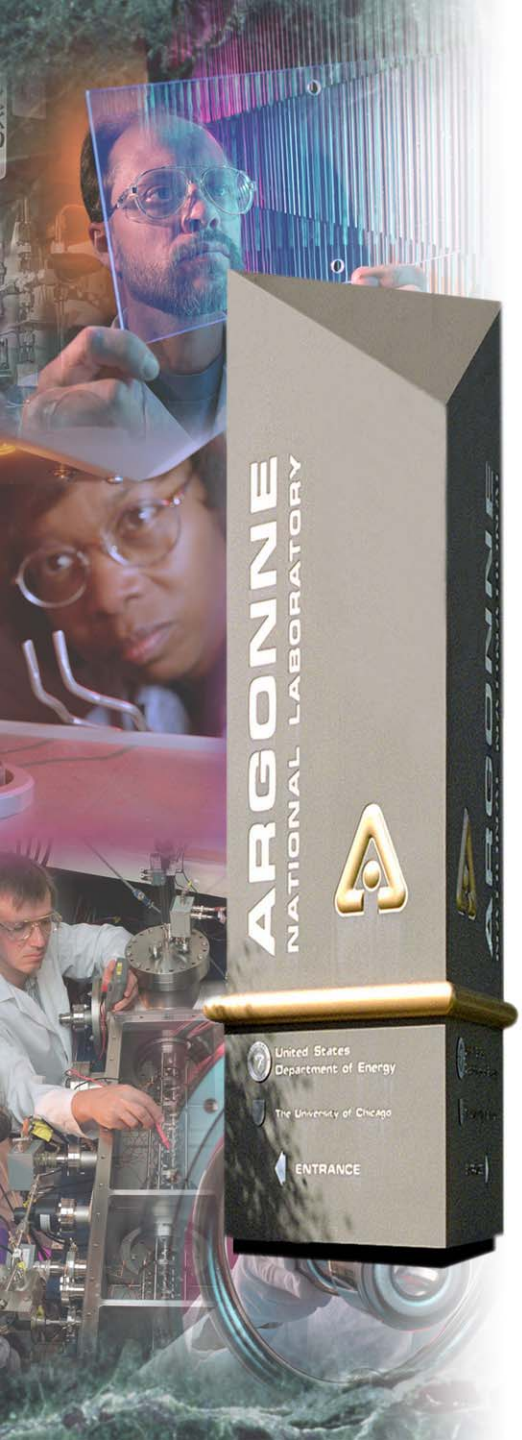


User Operations at the APS

William G. Ruzicka

The University of Chicago Review
for the Advanced Photon Source
at Argonne National Laboratory

September 17-19, 2003

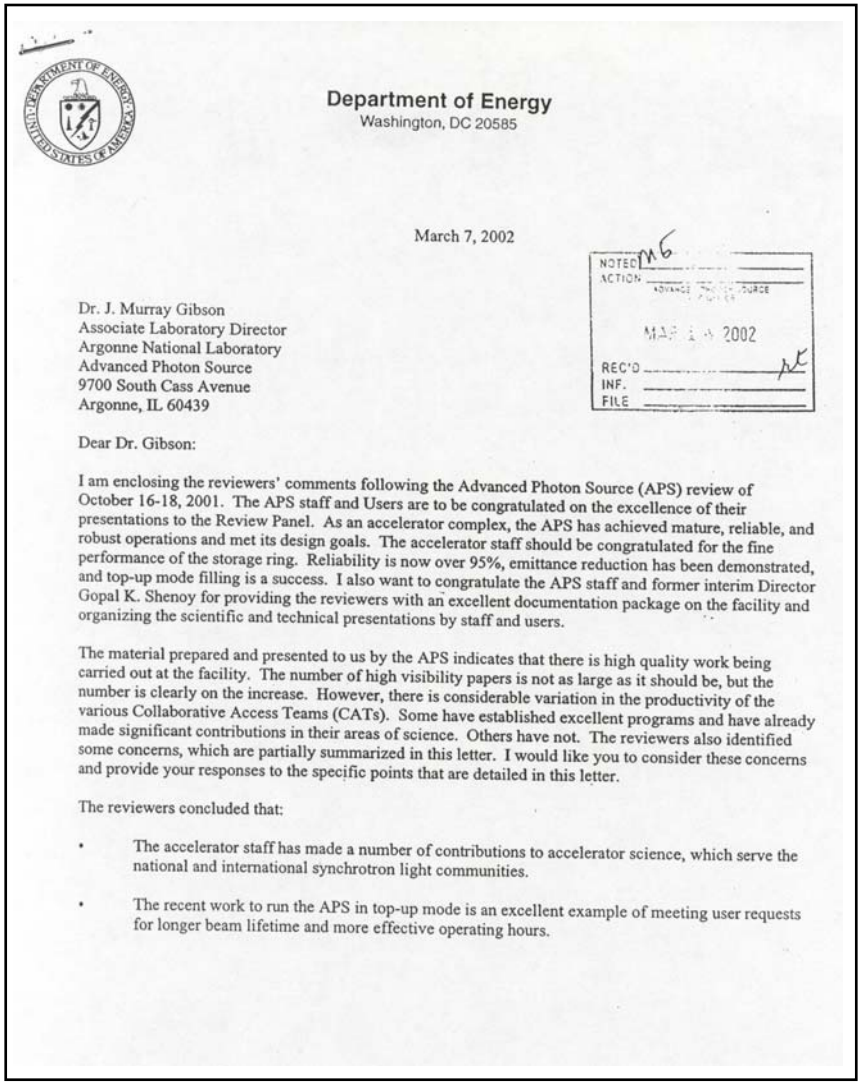
Office of Science
U.S. Department of Energy

A U.S. Department of Energy
Office of Science Laboratory
Operated by The University of Chicago

- **Much user advice to APS**
- **Much progress on recommendations**
  - **Strengthened ES&H support**
  - **User representatives at OPS Directorate**
  - **Improved detector pool**
  - **Improved equipment pool**

DOE Review in October 2001 Recommendations - March 2002

- "Top-up mode is an excellent example of meeting user requests"
- "ES&H support for the CATs should be strengthened"
- APS shall "implement a beam-time allocation process for general user proposals"
- APS "should identify savings that should be redirected to outreach and increased priority to user support"



Department of Energy
Washington, DC 20585

March 7, 2002

NOTED 3/6
ACTION
MAR 14 2002
REC'D
INF.
FILE

Dr. J. Murray Gibson
Associate Laboratory Director
Argonne National Laboratory
Advanced Photon Source
9700 South Cass Avenue
Argonne, IL 60439

Dear Dr. Gibson:

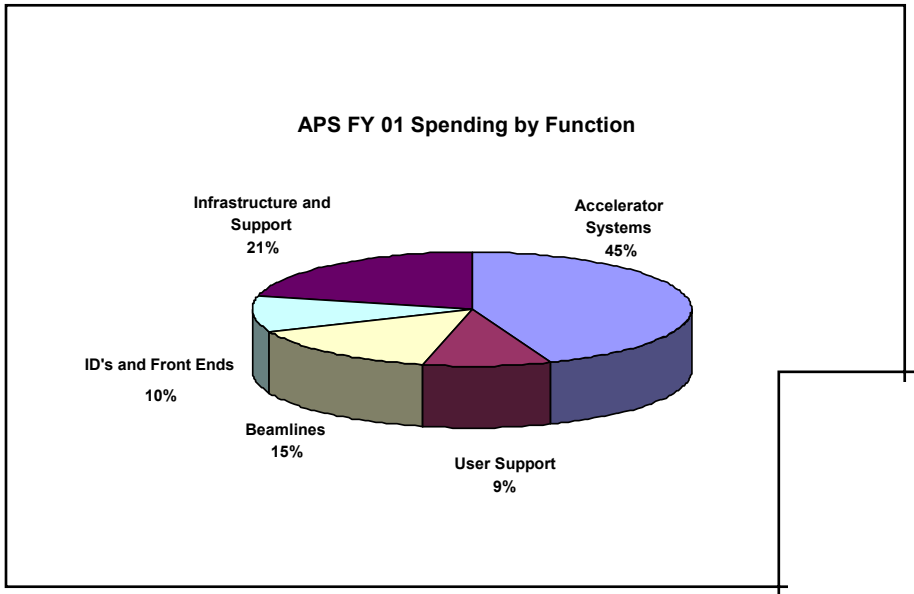
I am enclosing the reviewers' comments following the Advanced Photon Source (APS) review of October 16-18, 2001. The APS staff and Users are to be congratulated on the excellence of their presentations to the Review Panel. As an accelerator complex, the APS has achieved mature, reliable, and robust operations and met its design goals. The accelerator staff should be congratulated for the fine performance of the storage ring. Reliability is now over 95%, emittance reduction has been demonstrated, and top-up mode filling is a success. I also want to congratulate the APS staff and former interim Director Gopal K. Shenoy for providing the reviewers with an excellent documentation package on the facility and organizing the scientific and technical presentations by staff and users.

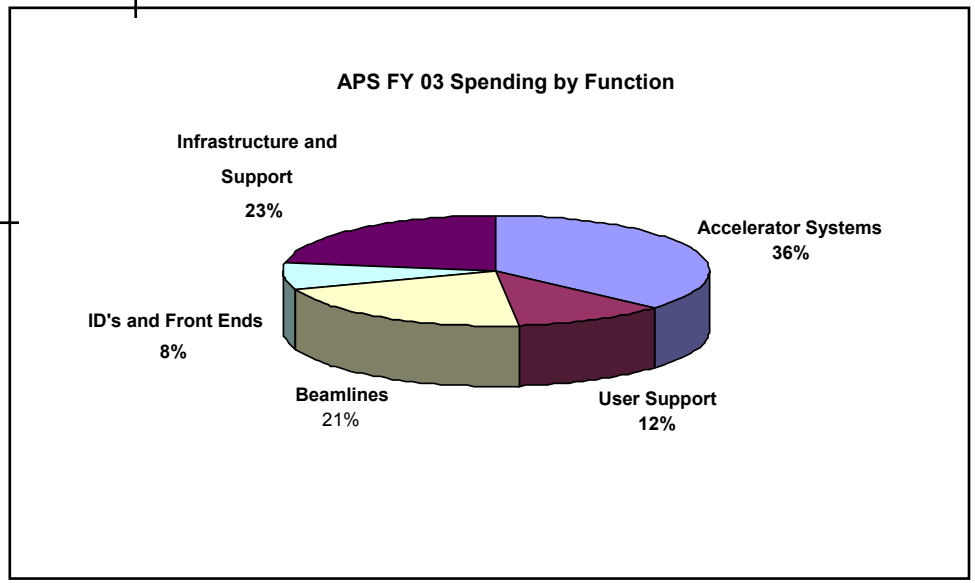
The material prepared and presented to us by the APS indicates that there is high quality work being carried out at the facility. The number of high visibility papers is not as large as it should be, but the number is clearly on the increase. However, there is considerable variation in the productivity of the various Collaborative Access Teams (CATs). Some have established excellent programs and have already made significant contributions in their areas of science. Others have not. The reviewers also identified some concerns, which are partially summarized in this letter. I would like you to consider these concerns and provide your responses to the specific points that are detailed in this letter.

The reviewers concluded that:

- The accelerator staff has made a number of contributions to accelerator science, which serve the national and international synchrotron light communities.
- The recent work to run the APS in top-up mode is an excellent example of meeting user requests for longer beam lifetime and more effective operating hours.

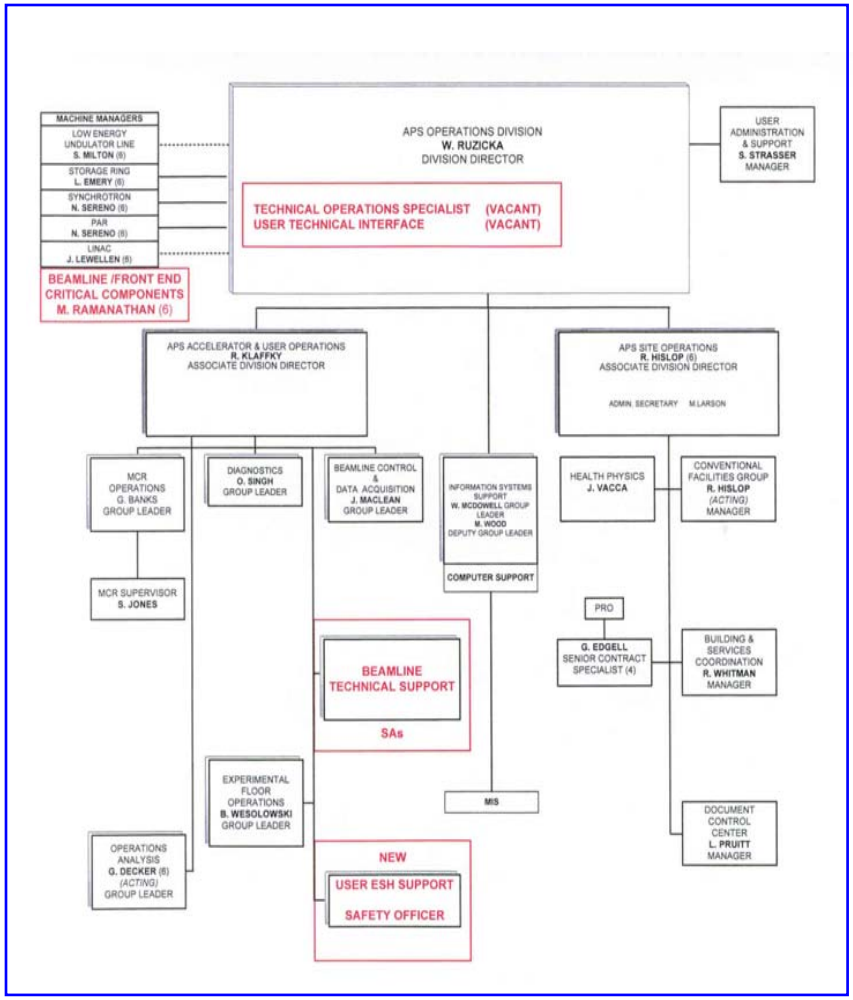
Increased Emphasis on User Support





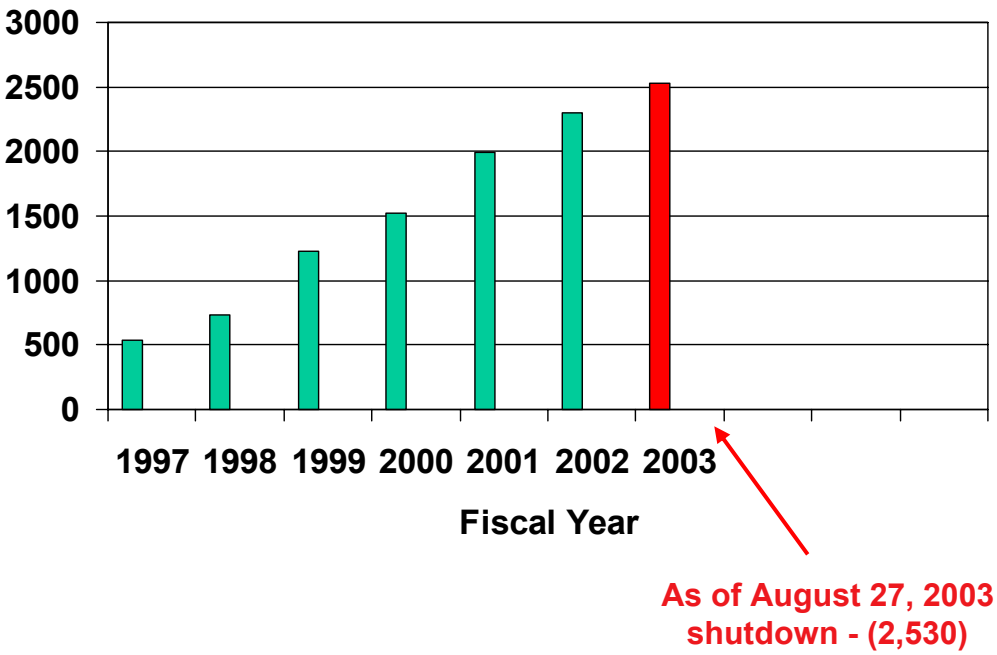
In Response to DOE Direction, AOD is Adding Personnel to Increase Standard User Support and Sector ES&H Support

- AOD creating new group: User ESH Support
  - Hire new User Safety Officer
  - Health Physics Group transferred here
  - Experiment safety reviews
- AOD will fill three open slots
  - Technical Operations Specialist (Policy and planning)
  - User Technical Interface (Technical information, resolve issues)
  - Beamline Technical Support Group Leader
- Repopulate Technical Support Group
  - Scientific associates
- Added box to Machine Manager category
  - Emphasize importance of APS ownership of beamline and front end critical components



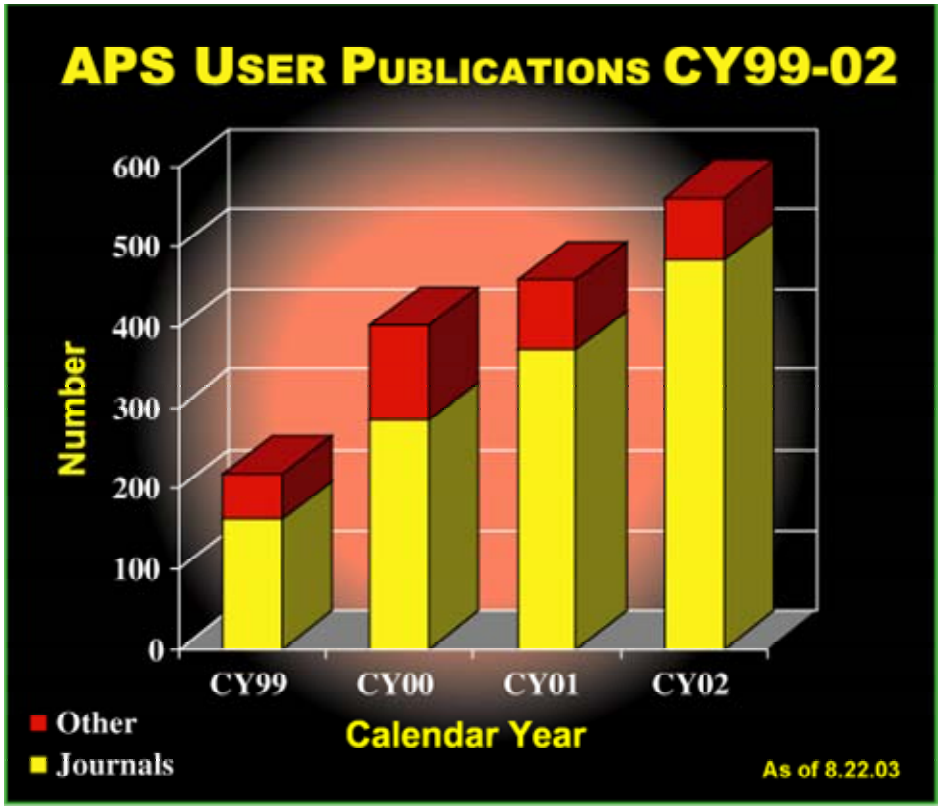
Growth of APS User Community

Total Number of Unique On-Site Users



- Total badged users visiting the APS at least once in FY 2002 = 2,299
- Total badged user visits in FY 2002 = 6,135
- Total badged users in FY 2002 = 5,101
- During 2002, the Argonne-East site had 2,767 facility users. 83% of this total were APS users.

Publications by APS Users



Scientific productivity has approximately tripled over the past three years as measured by the number of publications in refereed journals.

12th APS User Meeting April 29–May 1, 2003

- 500+ attendees
- 100+ posters
- 6 workshops
- 11 speakers
- 31 vendor exhibits
- DOE Washington update

Food & Socializing!

Outreach to New Users

Exhibit prepared for July American Crystallographic Conference – focus on research opportunities in crystallography

Approximately a third of attendees visited APS booth (more than 300 visitors)!

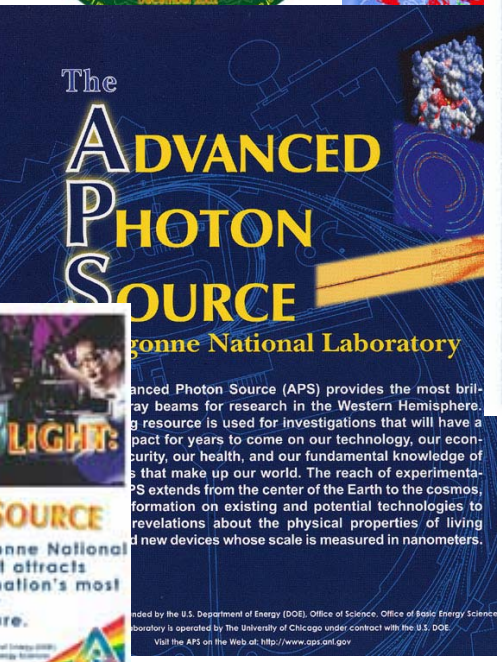
Booth staffed by APS resident users and User Office staff

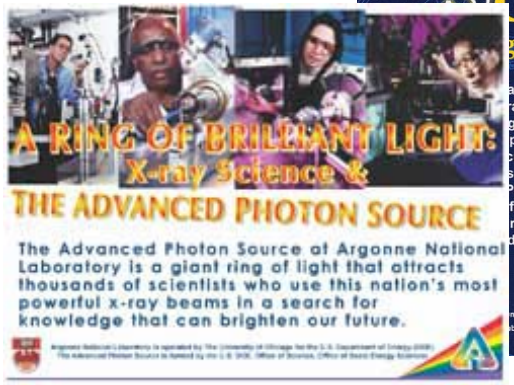
Several proposals prepared and submitted at meeting!

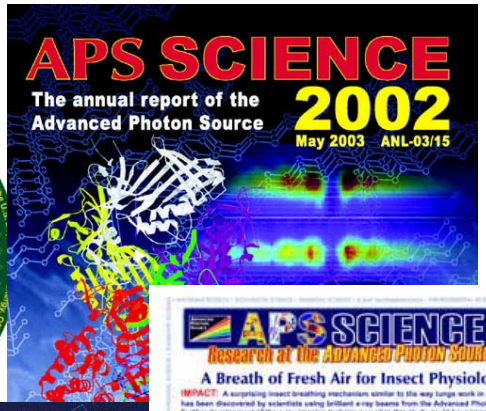
- **AOD plans on more outreach**
  - Material Research Society, American Chemical Society, American Physical Society, Geophysical Union, etc.

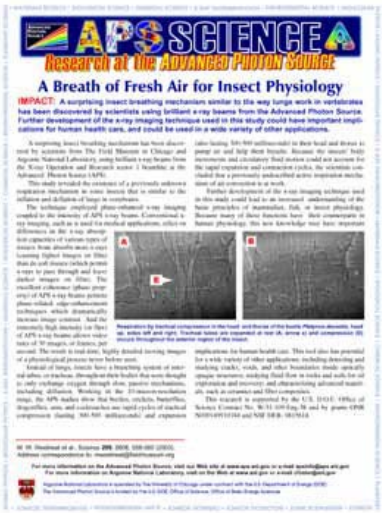
Publicity and Outreach: Inform, Persuade, and Educate

- APS Annual Report
- APS Activity Report
- One-page Research Highlights
- APS Newsletter (*The Source*)
- The World Wide Web
- Outreach and Education









New Upgraded APS Web Site Friendly to New Users

New User Click Here →

Beam Time Web Instructions

Getting Beam Time

FIRST-TIME USERS!
Avoid delays and headaches
Make the most of your time on site
Read our tips for new users!

Proposal Form

There are two ways to obtain beam time at the APS: either as a general user (a researcher not associated with a particular beamline) or as a member of a Collaborative Access Team (CAT). Most beamlines at the APS reserve between 25% and 100% of their available beam time for general users. The process below describes the procedure for applying for this beam time as a general user on any APS beamline. For more details, see the APS policy on general user access. If you are a CAT member, please contact your CAT on instructions on applying for CAT beam time.

How do I apply for beam time?

1. If you are a new user, please read the information for new users *before* you apply for beam time. You must complete certain administrative requirements before you can use APS facilities. In particular, the institution sponsoring your research must have a user agreement with the APS.
2. Decide which beamlines are suitable for your purposes. Consult the techniques directory to see which beamlines support the techniques you need. Detailed beamline specifications are also available.
3. Submit a proposal via our web-based system. Proposals are evaluated before each user run. For more information and the current proposal schedule, see the proposal system overview.

What happens after that?

In brief, proposals are peer-reviewed and rated by a review panel. Next, beam time is allocated by one of two Beam Time Allocation Committees. Once time has been allocated, the beamline staff schedule the proposals.

If your proposal is accepted: The APS User Office will notify you by e-mail when your proposal has been allocated time. A beamline staff member will contact you to arrange the exact time of your visit and other details, including completion of an Experiment Safety Approval Form.

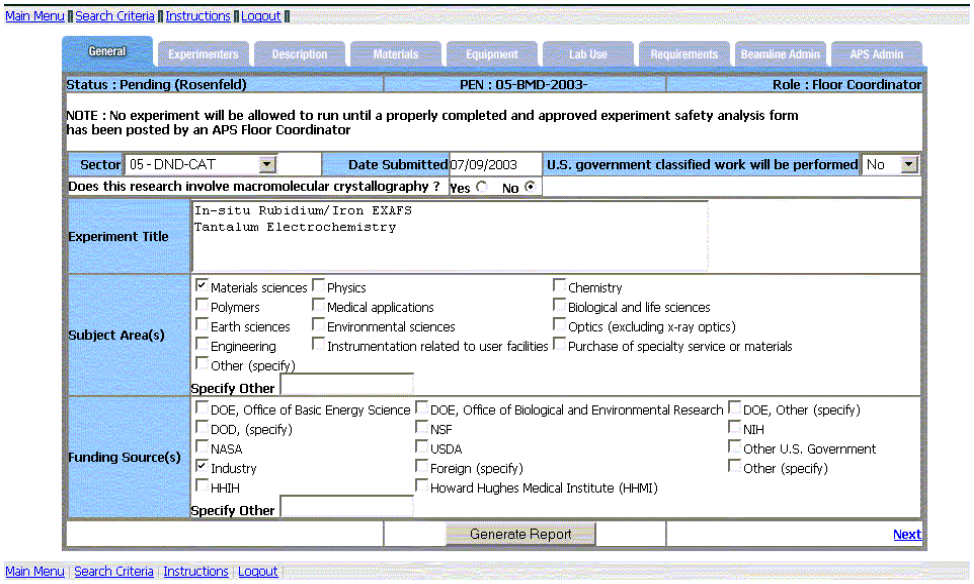
If your proposal is denied (i.e., not allocated to any of the beamlines you selected): The APS User Office will notify you of the decision and send the review comments. You have the option to submit a revised proposal or to appeal the decision.

New Position: Webmaster

New User-Friendly Web ESAF Form

ESAF = Experiment Safety Assessment Form

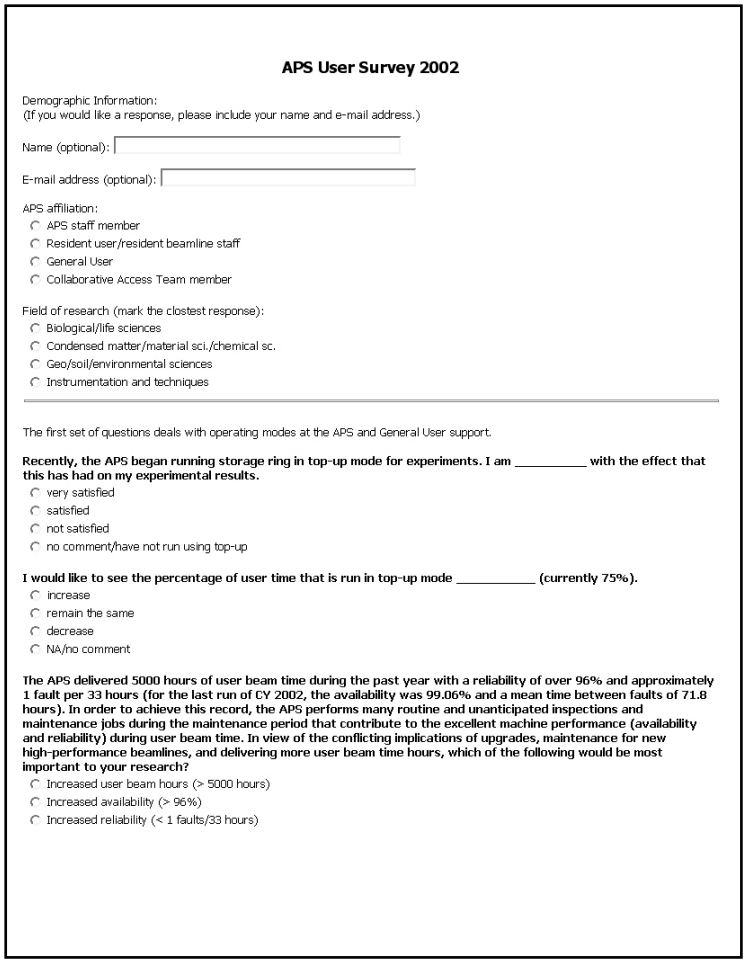
- ESAF completed by experimenter
- Before experiment begins:
  - *Beamline and the APS approve the experiment*
  - *All implemented safeguards are verified*
  - *APS floor coordinator posts ESAF form at beamline*



User Training – Mature Program

- **Facility Training**
  - Safety orientation
    - ANL & APS rules
    - Role of floor coordinators
    - Sector responsibilities
    - Personnel safety system (PSS)
    - General employee radiation training (GERT)
- **Site-Specific Training**
  - Beamline-specific training
  - Experiment-specific training (per ESAF)

Users Express Opinions



APS User Survey 2002

Demographic Information:
(If you would like a response, please include your name and e-mail address.)

Name (optional):

E-mail address (optional):

APS affiliation:
- APS staff member
- Resident user/resident beamline staff
- General User
- Collaborative Access Team member

Field of research (mark the clostest response):
- Biological/life sciences
- Condensed matter/material sci./chemical sc.
- Geo/soil/environmental sciences
- Instrumentation and techniques

The first set of questions deals with operating modes at the APS and General User support.

Recently, the APS began running storage ring in top-up mode for experiments. I am _____ with the effect that this has had on my experimental results.
- very satisfied
- satisfied
- not satisfied
- no comment/have not run using top-up

I would like to see the percentage of user time that is run in top-up mode _____ (currently 75%).
- increase
- remain the same
- decrease
- NA/no comment

The APS delivered 5000 hours of user beam time during the past year with a reliability of over 96% and approximately 1 fault per 33 hours (for the last run of CY 2002, the availability was 99.06% and a mean time between faults of 71.8 hours). In order to achieve this record, the APS performs many routine and unanticipated inspections and maintenance jobs during the maintenance period that contribute to the excellent machine performance (availability and reliability) during user beam time. In view of the conflicting implications of upgrades, maintenance for new high-performance beamlines, and delivering more user beam time hours, which of the following would be most important to your research?
- Increased user beam hours (> 5000 hours)
- Increased availability (> 96%)
- Increased reliability (< 1 faults/33 hours)

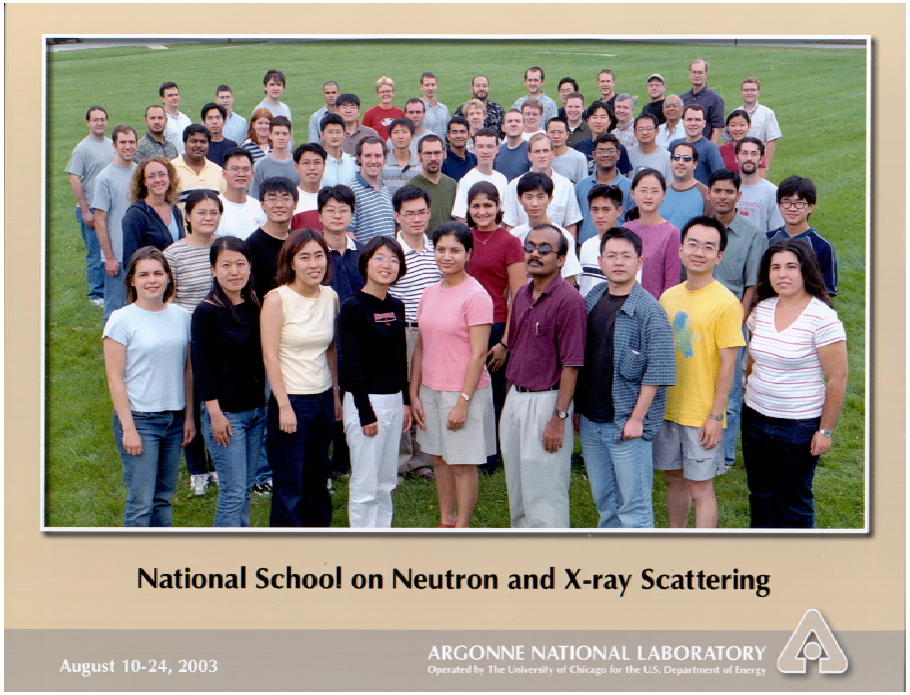
Results from APS User Survey 2002:

- 84% very satisfied/satisfied with top-up
- 85% very satisfied/satisfied with APS schedule or service (service on schedule, minimal downtime)
- 80% very satisfied/satisfied with user support by beamline staff
- 72% very satisfied/satisfied with facility support for users

National School on Neutron and X-ray Scattering August 10-24, 2003 at Argonne National Laboratory

- **Purpose – To educate U.S. university graduate students on the use of x-ray and neutron facilities**

- **The only school in the Western Hemisphere teaching both x-ray and neutron scattering techniques – including experiments**

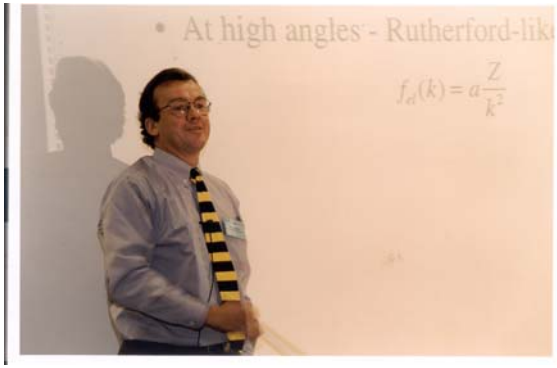


Two weeks

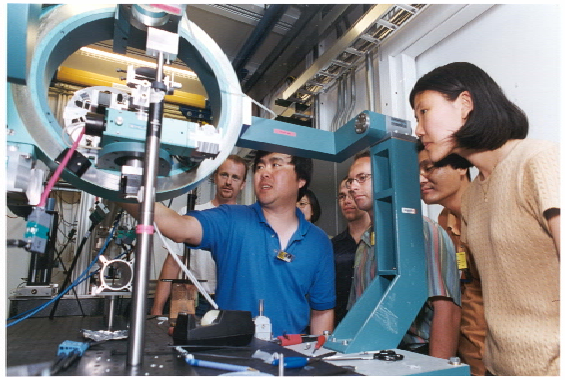
60 students

National School on Neutron and X-ray Scattering

- Classroom lectures



- Hands-on experiments (X-ray & neutron)



- Students (including Distinguished Course Auditor Patricia Dehmer, DOE–Associate Director of Basic Energy Sciences)

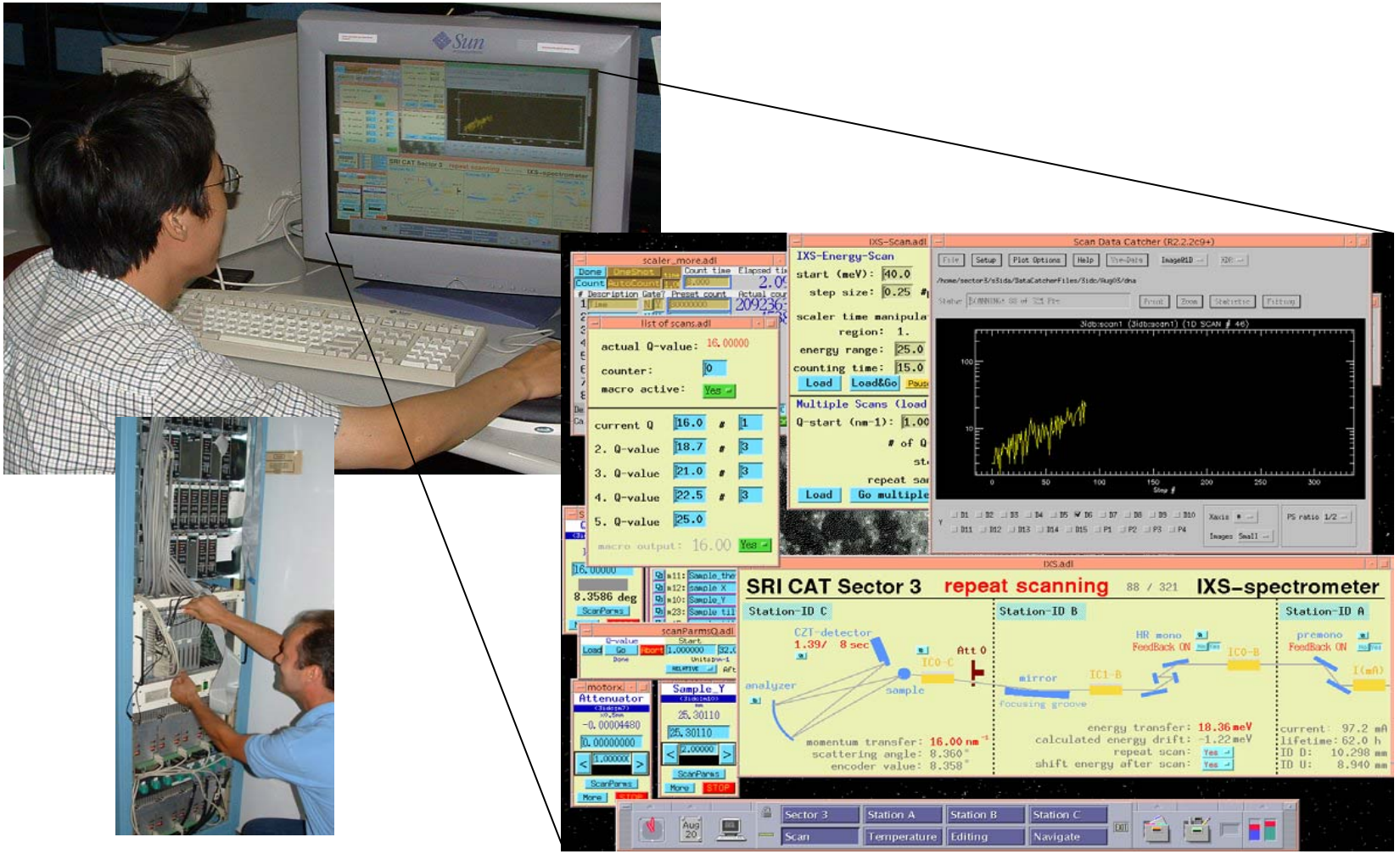
CAT–AOD Interactions

- **CAT Chat**
  - Weekly meeting with CAT personnel on a variety of issues
  - Minutes taken, posted on web
  - Questions answered the following week in writing

- **CATNet**
  - E-mail distribution of operations items (as needed)

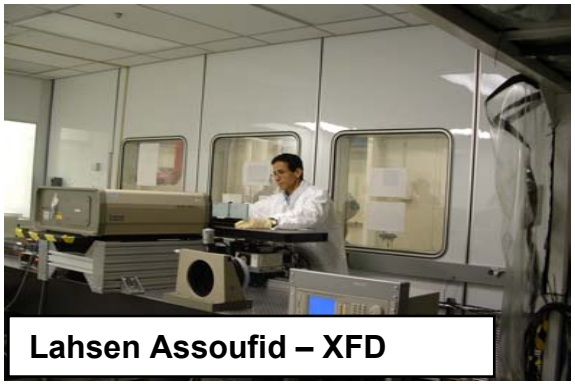
- **TWG (Technical Working Group)**
  - Monthly user meeting with operations status reports

Beamline Controls – Sector Friendly

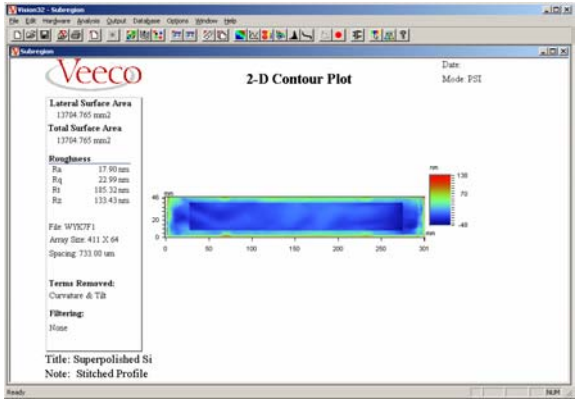


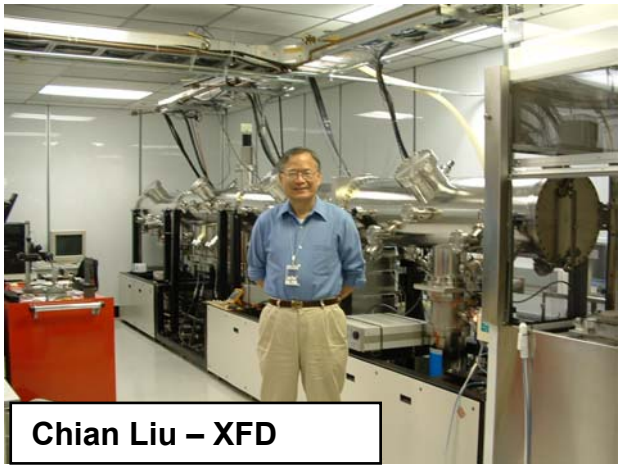
Optics Fabrication, Metrology, and R&D

- **Metrology Laboratory**
  - Characterize optical surface figure and finish
  - 300-mm-long super-polished silicon substrate



Lahsen Assoufid – XFD





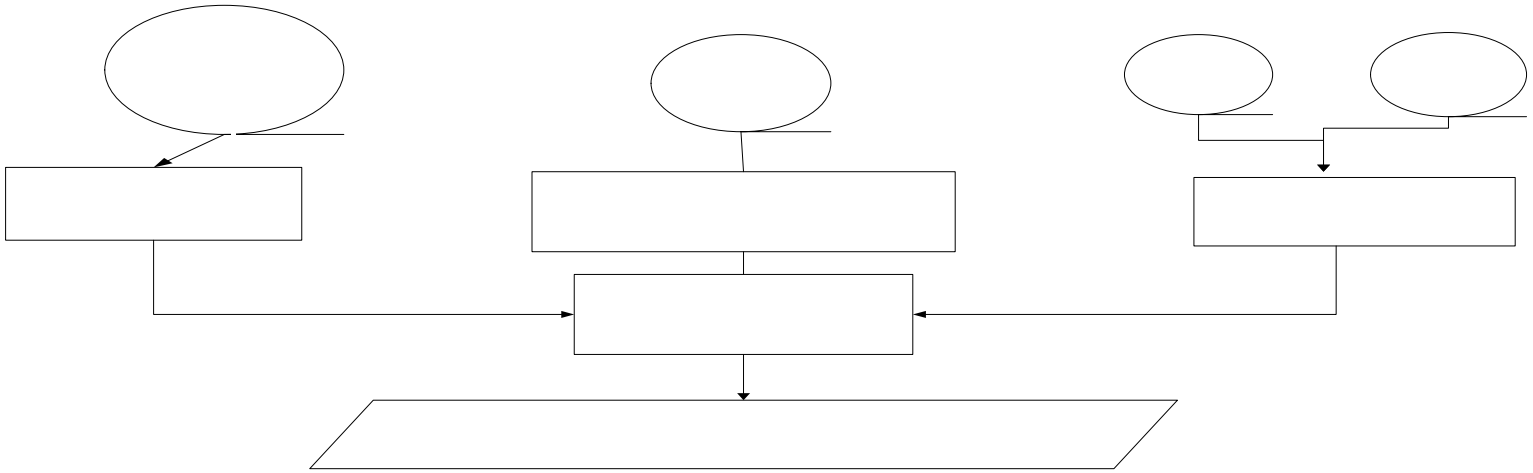
Chian Liu – XFD

- **X-ray Optics Development**
  - Sputter-profile coating to change mirror shape

A. Macrander, Group Leader
L. Assoufid, Physicist
R. Conley, Scientific Assoc.
R. Khachatryan, Scientific Assoc.
A. Khounsary, Mechanical Eng.
F. Krasnicki, Physicist-Exp. Sci.
C. Liu, Physicist
J. Maj, Scientific Assoc.

More information on posters 17 & 18

Response to DOE Requirement: Centralized Schedule and Beam Time Usage



Beamline Usage Data for X-ID-C 2003-1 Rur

	Feb 03 (552 hrs)			Mar 03 (624 hrs)			Apr 03 (408 hrs)		
	00-08	08-16	16-24	00-08	08-16	16-24	00-08	08-16	16-24
1	0 1 X	- 0 X	0 0 X	0 0 X	1 0 X	0 0 X	0 0 X	- 1	0 1 X
2	0 0 X	0 0 X	0 0 X	0 0 X	0 0 X	0 0 X	1 1 X	- 0 X	0 0 X
3	0 1 X	- 0 X	- 1	0 0 X	- 0 X	0 1	0 0 X	- 0 X	0 0 X
4	- 1	0 0 X	0 0 X	- 1	0 0 X	- 0 X	1 0 X	0 0 X	0 0 X
5	0 1 X	0 0 X	0 0 X	0 0 X	0 0 X	0 0 X	- 0 X	- 0 X	0 0 X
6	0 0 X	0 0 X	0 0 X	- 0 X	0 0 X	0 0 X	0 1 X	0 0 X	0 0 X
7	0 1 X	0 0 X	0 0 X	0 0 X	0 0 X	0 0 X	- 0 X	- 1	- 1
8	0 0 X	0 0 X	0 0 X	0 0 X	0 0 X	0 0 X	- 1	- 1	- 1
9	0 1 X	0 0 X	0 0 X	0 0 X	0 0 X	0 0 X	- 1	- 0 X	0 0 X
10	1 1 X	- 1	- 1	0 0 X	- 1	- 1	1 0 X	0 0 X	0 0 X
11	- 1	- 1	- 1	- 1	- 1	- 1	0 0 X	0 0 X	0 0 X
12	- 1	0 0 X	0 0 X	- 1	0 0 X	- 0 X	1 1 X	0 0 X	0 0 X

A	B	C	D	E	F
	Name of beam line	% of FY beam line was useable	# of hours **SCHEDULED** on beam line	# of hours **DELIVERED** to beam line	# of hours that researchers **USED** the delivered time
1					
2					

Morse Watchman System/

APS – Proactive in Anticipating Sector Needs

Survey Form for Sample Preparation and Characterization Lab

A suggestion has come forth regarding the possible need for an APS provided and operated sample preparation lab and a sample characterization lab.

Please complete the following survey so that an assessment can be made.

Name of responder: _____

Sector #: _____

☐ I and users at my sector have no interest in using a sample preparation and characterization lab.
(If checked, continue to *Comments* section.)

☐ I or users at my sector would be interested in using a sample preparation and characterization lab.
(If checked, please complete the remainder of this survey form.)

Types of equipment desired *(be as specific as possible)*:

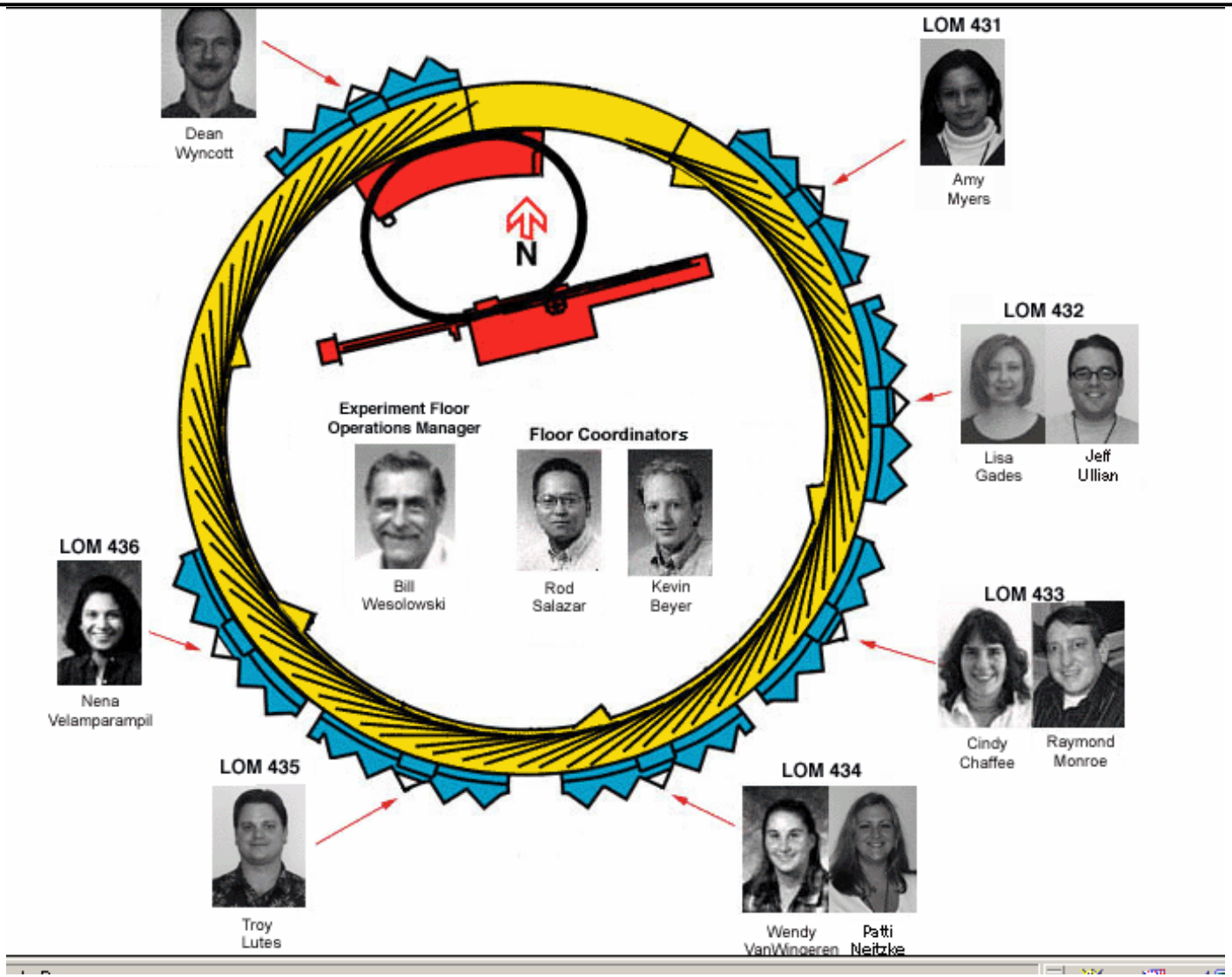
Types of sample preparation/characterization desired:

Emergency Power to be Delivered to Each Sector

Diesels have extra capacity

Sectors to determine individually which of their loads should be put onto emergency power

Floor Coordinators



Floor Coordinator Oversight Functions

- **Interact with users to ensure that activities comply with safety requirements and posted experiments**

- **Beamline Configuration Control**
  - Shielding verification oversight
  - On regular basis, review each beamline configuration

- **APS Enable Key**
  - Floor coordinators have the authority to shut down a beamline if they believe an unsafe condition exists (STOP WORK)

Local APS Management Outreach

- Coffee cart on experiment hall floor
- APS management interacts with sector staff/users