



... for a brighter future

Regional Collaborations, Synergies and Partnerships at the APS

Dennis M. Mills

Advanced Photon Source

3-Way Meeting March 18, 2008



U.S. Department
of Energy

UChicago ►
Argonne_{LLC}



A U.S. Department of Energy laboratory
managed by UChicago Argonne, LLC

Collaborations and Partnerships

My disclaimer....

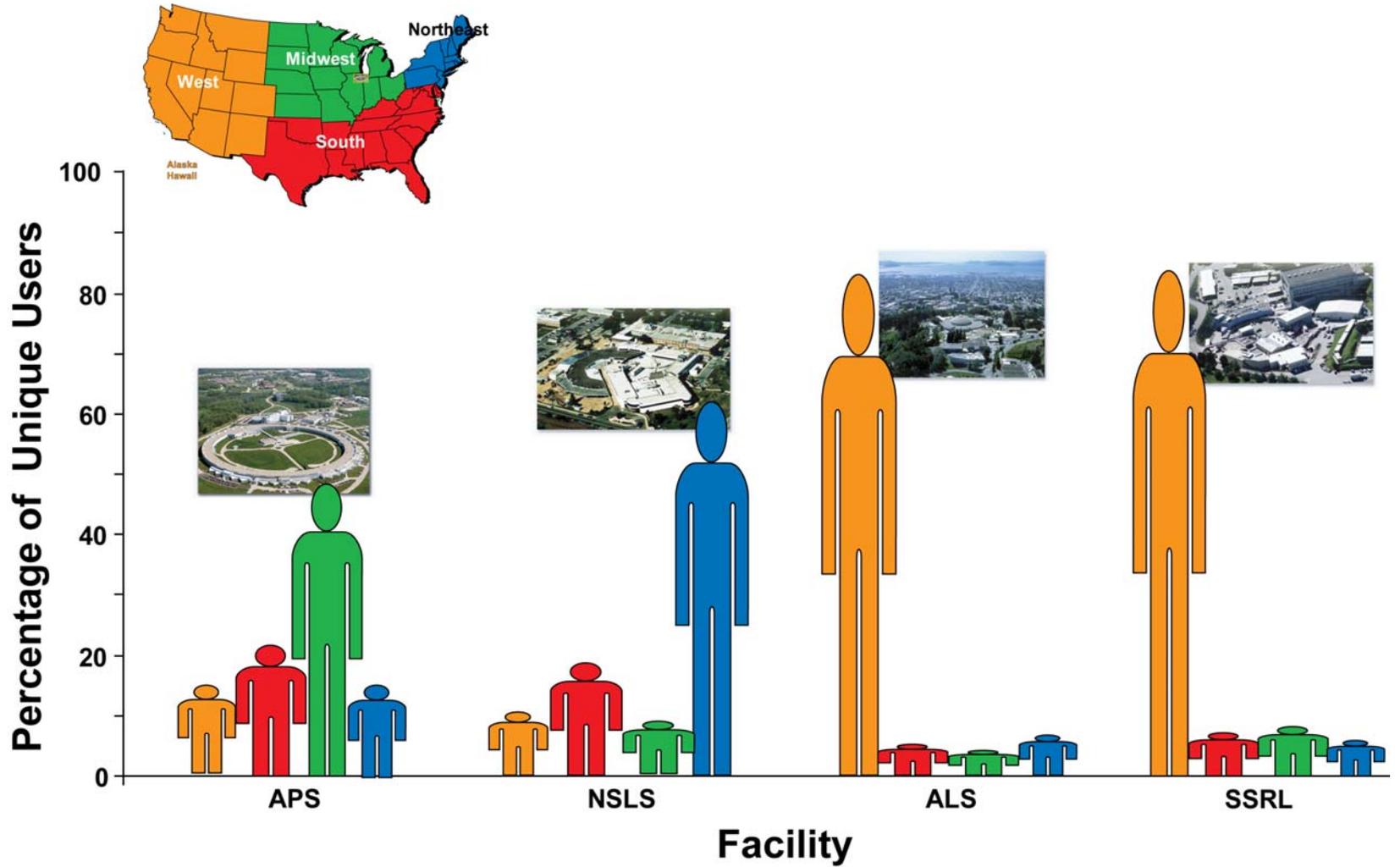
- As with any large facility we have many partnerships and collaborations, regional, national, and international.
- In the spirit of the Session's theme, "Links with Agencies and Territory", I will look at **regional** collaborations and partnerships APS is involved with.
- The partnerships I describe here are formal relationships and of course there are many **smaller, but not less important**, collaborations between APS staff and staff of regional institutions.
- I apologize if I have missed any....

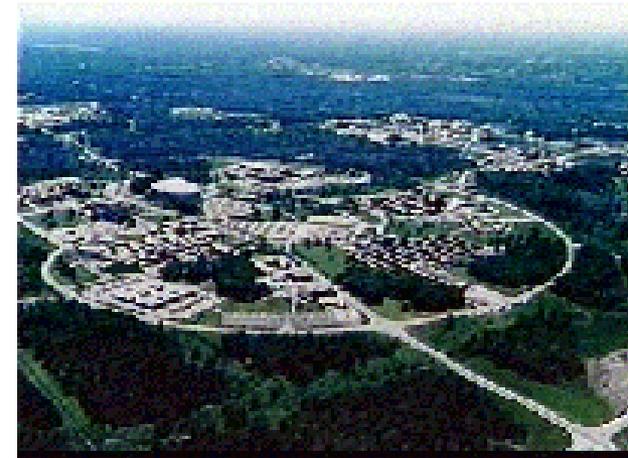
The Region



- ★ ARGONNE/APS
- A - U of I Chicago
- B - IIT
- C - U of Chicago
- D - Northwestern
- E - Fermilab
- F - Northern Ill Univ.
- G - U of I Urbana/Champaign

Users Geographical Distribution for the DoE SR Facilities



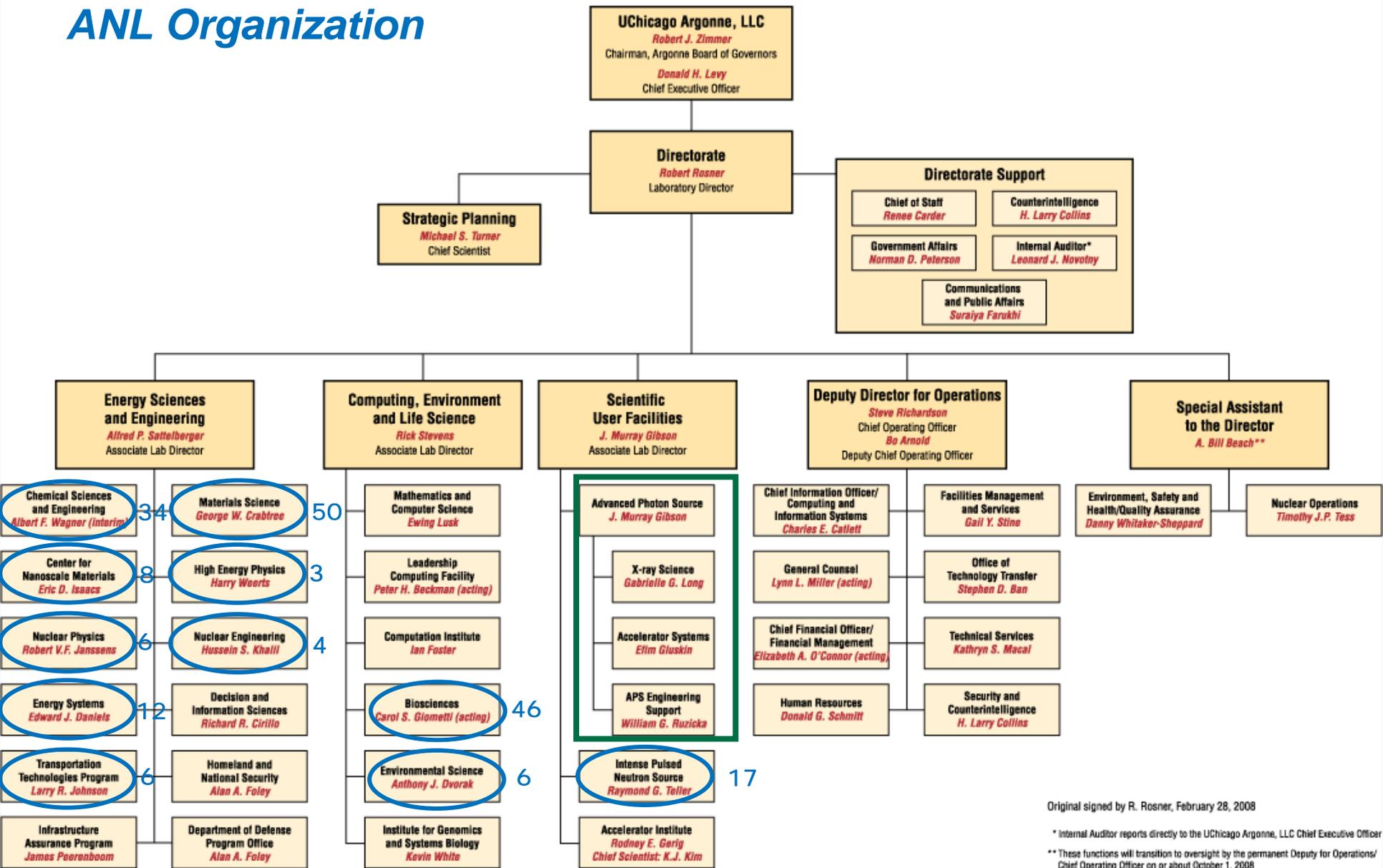


- Argonne is one of the U.S. Department of Energy's largest research centers. It is also the nation's first national laboratory, chartered in 1946.
- Argonne is a direct descendant of the University of Chicago's Metallurgical Laboratory, part of the World War II Manhattan Project. After the war, Argonne was given the mission of developing nuclear reactors and over the years has become a multidisciplinary laboratory.



- Argonne is a U.S. Department of Energy laboratory managed by UChicago Argonne, LLC.
- Science Policy Council
 - A collaboration with U of C, Northwestern University and the University of Illinois has been established to enhance Argonne's scientific capabilities, to strengthen the state's technological base and workforce preparation, and to improve Illinois' ability to compete for federal research funding.

ANL Organization



Original signed by R. Rosner, February 28, 2008

* Internal Auditor reports directly to the UChicago Argonne, LLC Chief Executive Officer

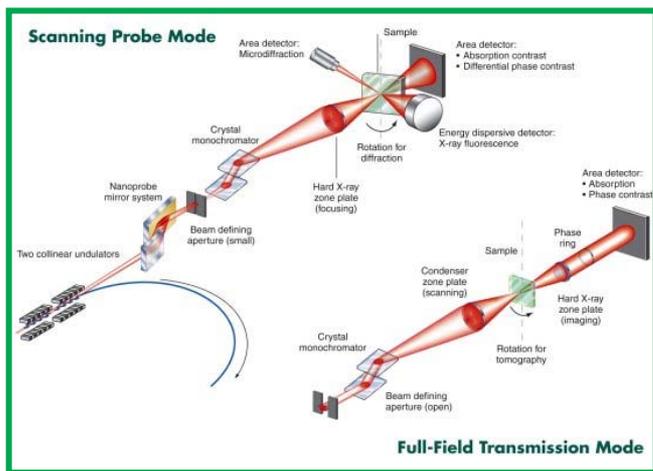
** These functions will transition to oversight by the permanent Deputy for Operations/ Chief Operating Officer on or about October 1, 2008

Partnerships and Collaborations Inside ANL

■ Center for Nanoscale Materials (CNM)

- Joint operations of the Nanoprobe beamline (Sector 26) with the APS
- Will be available to General Users not doing nanoscience, but rather just need the unique capabilities of the beamline
- Share certain aspects of the General User proposal system
- Will become operational (available to General Users) in 2008

Heard much about this at the
Workshop on Monday

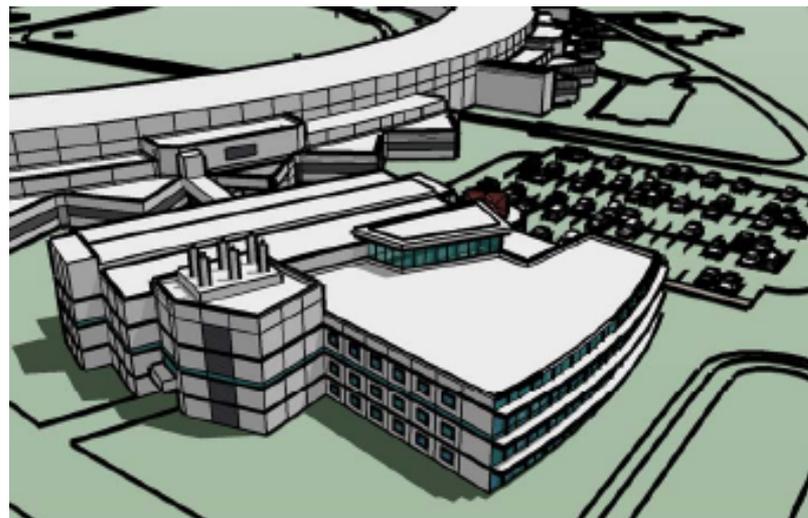
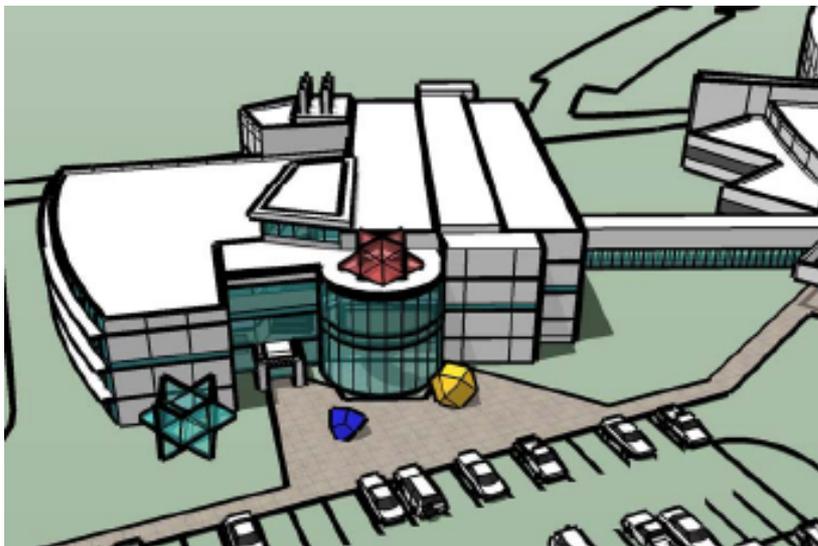


The CNM will serve as a user-based center, providing tools and infrastructure for nanoscience and nanotechnology research.

Partnerships and Collaborations Inside ANL (cont)

■ Biosciences Division

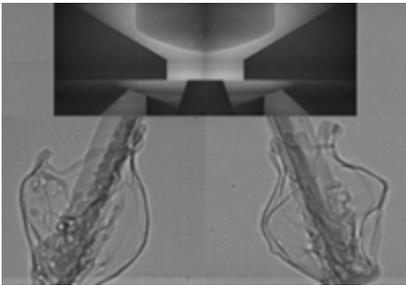
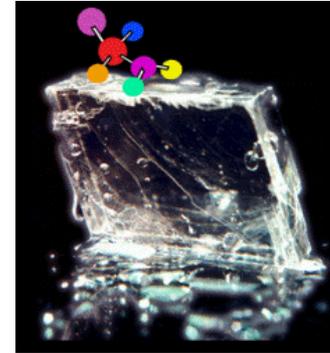
- Home to the staff of the Structural Biology Center (SBC) that operates Sector 19
- Home to staff of the General Medicine/Cancer Institutes of Health Collaborative Access Team (GM/CA CAT) that operates Sector 22.
- Member of MR Collaborative Access Team that operates Sector 10
- Advanced Protein Crystallization Facility (APCF)
 - *State-of-the-art highly automated laboratory and scientific-collaboration facility to produce proteins and protein crystals*
 - *Specialized labs devoted to structure determination of more challenging classes of proteins and assemblies*



Artist's rendition of APCF adjacent to the APS

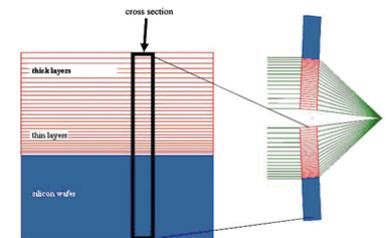
Partnerships and Collaborations Inside ANL (continued)

- Chemical Science and Engineering Division (CSE)
 - Member of the MR Collaborative Access Team that operates Sector 10



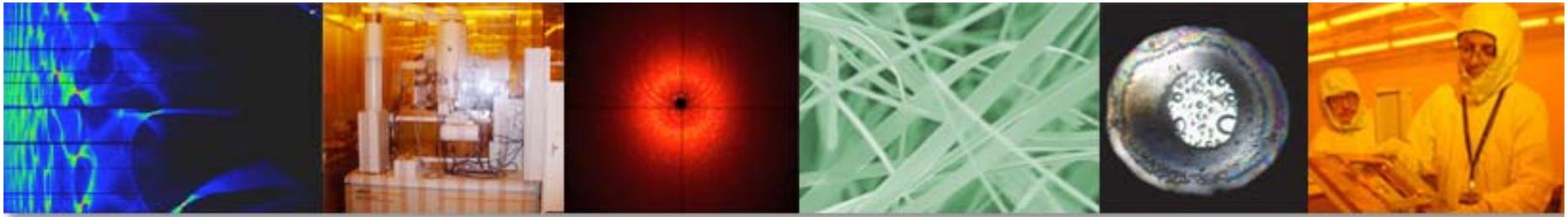
- Transportation Technology R&D Center
 - Collaborating with APS staff on fuel spray experiments
 - Working on development of a dedicated BM station

- Materials Science Division (MSD)
 - Many expert/super users and APS collaborators
 - Co-organizers of National Neutron/X-ray Scattering School - NXSchool
- Intense Pulsed Neutron Source (IPNS)
 - Joint appointments
 - Co-organizers of National Neutron/X-ray Scattering School - NXSchool



Coordination between ANL User Facilities

- For the past several years, four of the User facilities at ANL, APS, IPNS, CNM and the Electron Microscopy Center have joined together for a shared User Meeting week and developed Workshop topics of shared interest.
 - Diffraction studies of structural and mechanical properties
 - SAXS and SANS applications in nano materials and nano biology
 - Scientific advances in inelastic X-ray scattering
 - Software for challenging cases in macromolecular crystallography
 - Emergent states at interfaces of complex oxides: What can be learned from local probes
 - Nanoscale heterostructures
 - Nanoscale phenomena near phase transitions
 - Scattering and spectroscopic studies of materials in high magnetic fields
 - Scientific applications of nuclear resonant scattering
 - In-situ surface science: Growth and properties of new materials (half day)
 - Synchrotron radiation in pharmaceutical science: Freeze drying and other applications (half day)



Plans for a New Synergy at Argonne

■ Argonne Scattering, Imaging, and Spectroscopy Institute (ASISI)

- A proposal has been developed by members of APS, IPNS, Biosciences, Chemistry, Math & Computer Science, and Materials Divisions (and other non-ANL members) to develop an institute here at ANL to develop the theoretical and computational tools that are necessary to optimize the scientific productivity of large neutron and x-ray user facilities.
- ASISI is envisioned as having permanent and visiting staff that have expertise in:
 - *Scattering, spectroscopy and imaging theory*
 - *Experimental techniques*
 - *Simulation*
 - *Numerical analysis and algorithm development*
 - *Data visualization*
 - *Software engineering*

and will address the grand challenges in scattering and imaging sciences

Partnerships with Local Universities (continued)

■ Northwestern University

- Member of collaborative access team that operates DuPont - Northwestern-Dow CAT (Sector 5)
- Member of collaborative access team that operates Life Sciences CAT (Sector 21)
- Staff of DND and LS CATs are Northwestern employees
- Science Policy Council



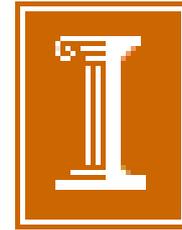
■ Northern Illinois University (NIU)

- Institutional member of CARS
- Joint appointment of theorist with APS
- Detector interactions (integrated circuit design)

Partnerships with Local Universities

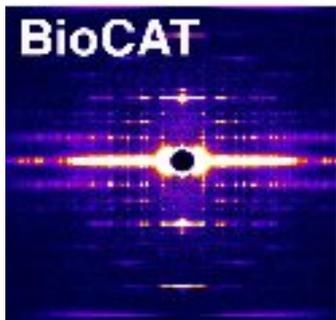
■ University of Illinois at Urbana-Champaign)

- Member of (ex) UNI CAT
- Member of Collaborative Development Team for (CDT) the Intermediate Energy Beamline
- Science Policy Council



■ Illinois Institute of Technology

- Member of collaborative access team that operates Bio CAT (Sector 18)
- Member of collaborative access team that operates Materials Research (MR) CAT (Sector 10)
- Staff are IIT employees



Partnerships with Local Universities

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

■ University of Chicago

- Center for Advanced Radiation Sources (CARS)

- Operate *GeoSoilEnviro CARS* (sector 13)

GeoSoilEnviroCARS
The University of Chicago



Argonne National Laboratory • Advanced Photon Source

- Operate *BioCARS* (sector 14)



- Operate *ChemMat CARS* (sector 15)



- Operate *IMCA CAT* (sector 17)



- Lead team member (along with Jacobs Engineering and BWX Technologies) in the LLC to operate Argonne National Laboratory (UChicagoArgonne, LLC)

UIC

■ University of Illinois at Chicago (UIC)

- Institutional Member of CARS
- Science Policy Council

Partnerships with Fermi National Accelerator Laboratory

- No collaborations directly related to APS operations today.
- However, the potential for future collaborations related to 4th generation light sources (superconducting linacs, high brightness guns, etc.) and other areas is certainly a possibility.



Universities Research Association (URA) and the University of Chicago (UChicago) have joined forces to create Fermi Research Alliance (FRA), a limited liability company (LLC).



Fermi National Accelerator Laboratory

Interactions with our Partner Users

- With such a large and diverse user community, good two-way communications is critical.
- The Partner Users Council, or PUC, made up of representatives of the “investors in the facility”, meet quarterly with APS management.

Partner User Council
Executive Board
Members



From the Charter/Bylaws for the Partner Users Council

3. Functions.

- a. The Council shall be advisory to the Associate Laboratory Director for the Advanced Photon Source. Written recommendations are to be provided to the APS-ALD, APSUO-Steering Committee, or the APS-SAC as required.
- b. The Council shall provide advice and recommendations to the ALD in the matters affecting current and future beamline operations, APS facility development, and the special APS-to-Partner User relationship.
- c. The Council shall serve as an advocacy group for the facility, its partners, and the user community.

And speaking about advocacy.....

Synergies with Neutron Sources for Advocacy

■ The Synchrotron and Neutron Users' Group (SNUG)

- The Synchrotron and Neutron Users' Group (SNUG) is a group of scientists dedicated to science advocacy for synchrotron and neutron science, representing over 10,000 faculty, student, industrial and government scientists nationwide.

■ Why it matters.

- Research conducted at synchrotron and neutron sources is critical to every sector of the economy
- And yet constrained funding for 35 years has slowed US progress.

■ What does SNUG do?

- Group members visits Congress and other government agencies to lobby for support of science in general and facilities in particular. (Funding for trips cannot be from the federal government.)

