



... for a brighter future

Argonne National Laboratory Overview

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of Educational Programs***

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A U.S. Department of Energy laboratory
managed by The University of Chicago

About Argonne

- Founded in 1943, designated a national laboratory in 1946
- Managed by The University of Chicago for the U.S. Department of Energy
 - More than 2,900 employees and 5,000+ facility users
 - About \$525M budget
 - 1,500-acre, wooded site in DuPage County, Illinois
- Broad R&D portfolio
- Numerous sponsors



Argonne's Mission

- Serve DOE & national security
 - Advancing the frontiers of knowledge
 - Creating and operating forefront scientific user facilities (e.g., Advanced Photon Source, Argonne Tandem-Linac Accelerator System)
 - Providing innovative and effective tools and solutions to address environmental challenges to national and global well-being, in the near and long term
- In accomplishing its mission, Argonne partners with DOE, other federal labs, academia, and the private sector



Forefront Science and Engineering

- Basic and applied research
 - Materials and chemical sciences and engineering
 - High energy, nuclear, and atomic physics
 - Multidisciplinary nanoscience and nanotechnology
 - Structural biology, functional genomics, and bioinformatics
 - Environmental science, technology, and assessment
 - Transportation technology
 - Computer science and applied mathematics
 - Computational science
- Design, construction, and operation of accelerator-based user facilities
- Design, development, and evaluation of advanced nuclear energy systems and proliferation-resistant nuclear fuel-cycle technologies

Partnership Opportunities

- User facility access
 - Thesis/dissertation research
- Major initiatives
 - Participation; joint appointments
- Topical workshops and ‘summer schools’
- Science and engineering collaborations on other projects of mutual interest
 - Faculty and student research participation

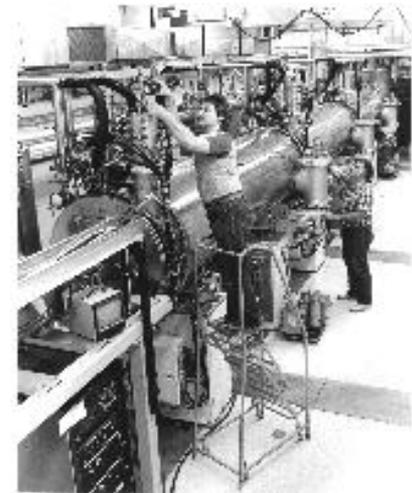
Advanced Photon Source

- Nation's most brilliant hard x-ray beams
- Materials science, chemistry, biology, protein crystallography, earth and environmental science, physics...
- 42 beamlines in operation
- More than 3,000 users
- Operates year-round, 5000 hours/year
- Reliability over 95%
- Innovative X-ray instrumentation and operating modes
- www.aps.anl.gov/



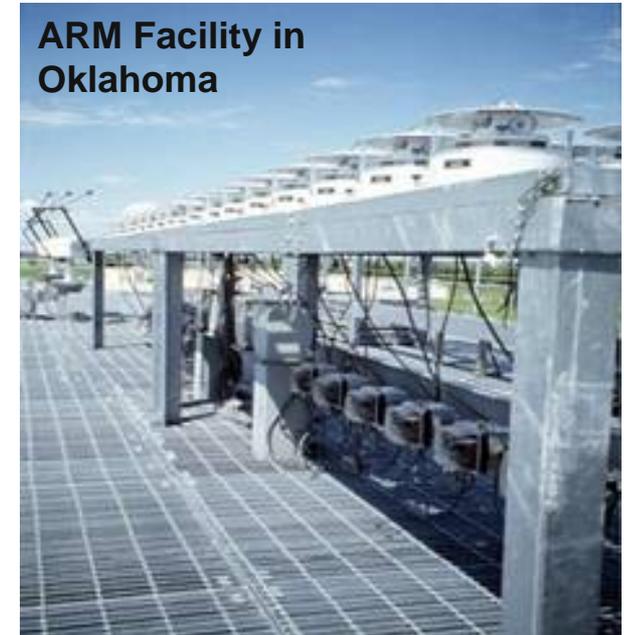
Argonne Tandem-Linac Accelerator System (ATLAS)

- Low-energy, precision beams of any ion from protons to uranium
- Nuclear physics
- 8 experiment areas
- More than 150 active users
- Greater than 95% reliability
- Scientific and technical base for Rare Isotope Accelerator
- Low-beta superconducting accelerator technology
- www.phy.anl.gov/atlas/



Other Significant R&D Facilities

- Electron Microscopy Center
 - www.msd.anl.gov/groups/emcmr/
- Atmospheric Radiation Measurement (ARM) program
 - www.arm.gov
- Transportation Technology R&D Center
 - www.transportation.anl.gov
- DOD approved Dilute Chemistry Facility
 - www.es.anl.gov/htmls/RDTE.html
- Many more:
 - www.anl.gov/Science_and_Technology/programs.html



Argonne's Major Initiatives

Science

- Nanoscience and Nanotechnology: Center for Nanoscale Materials
- Rare Isotope Accelerator
- Functional Genomics
- Petascale Computing and Computational Science

Energy

- Advanced Nuclear Energy Systems
- Hydrogen Research and Development

Faculty and Student Participation

- Use of national user facilities
- Research collaboration
- Joint appointments
- Faculty summer/sabbatical research
- Student summer/thesis research
- Postdoctoral positions
- Topical schools & workshops
 - Neutron & X-ray summer school
 - RIA science school
 - Nanoscience, computing, etc
 - Annual Undergraduate Research Symposium
- www.dep.anl.gov



Scope of the Program – Argonne National Laboratory

- More than 5,000 participants in DEP in 2007



Faculty	63
Graduate Students	319
Undergraduates	798
K-12	3,614
Postdocs	175

– User Facilities

Advance Photon Source	3,215
Pulse Neutron Source	242
ATLAS	187
Electron Microscopy Center	154

Highlights and Successes

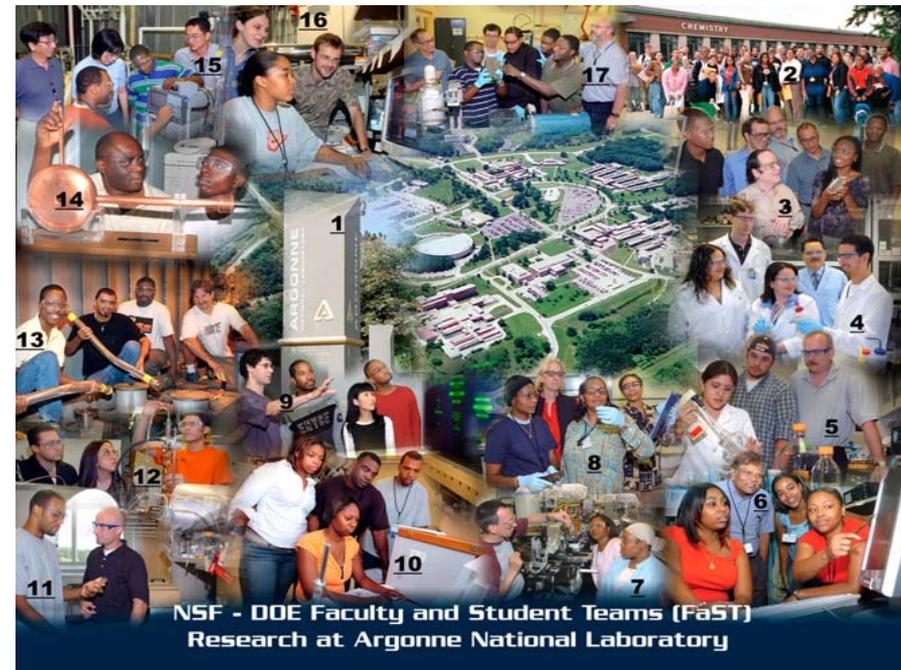
Success of DEP programs indicated by:

Thousands of students working accident free

Consistent expression of satisfaction and appreciation from mentors and students

The FaST program is the DOE SC largest single faculty-student program directed toward underrepresented groups in science and engineering

All DEP programs in the Argonne Policy and Procedure Manual (increases safety and security of participants)



The Impact of Research Participation Programs is Significant

- SRI International evaluation of undergraduate research opportunities (UROs) with NSF (Science 27 April 2007) concluded that UROs:
 - Increased an understanding of how to conduct a research project and solve scientific problems
 - Increased confidence in research skills
 - Increased awareness of what graduate school will be like
 - Clarified interests in science and engineering careers
 - Increased expectations of obtaining a Ph.D.

The 19th Annual National Conference of Black Physics Students

**Engage in Physics at the Frontiers of Science:
Argonne National Laboratory
and The University of Chicago**
February 3-5, 2005

The conference will provide participants the opportunity to interact with other African-American undergraduate and graduate students and physicists. Conference events include technical presentations by fellow students and scientists; seminars on how to succeed in college, graduate school, and your career; visits to government laboratories; and discussions with recruiters from graduate schools, government and industrial laboratories.

www.dep.anl.gov/ncbps

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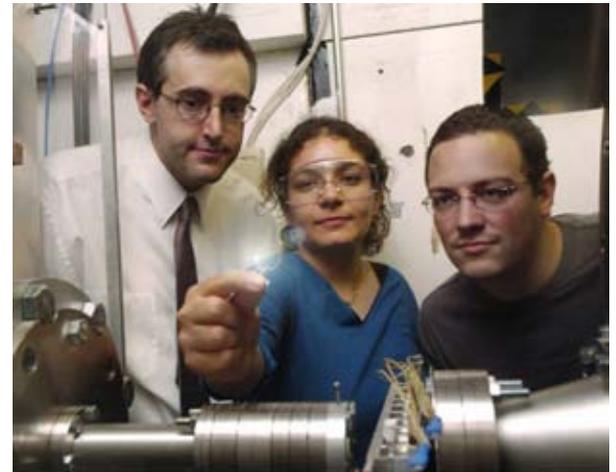
Impact of Research Participation Programs at Argonne

- Program participants twice as likely to secure an R&D position
- Program participants three times as likely to work in federal laboratory
- Over 200 former students are presently employed at Argonne
- A former program participant is currently an AL
- Two former students were Nobel Prize winners (T.Cech/Chm89 and W.Phillips/Phy97)



Graduate Student Programs

- Thesis Research at Argonne
- Graduate Student Users at the National User Facilities
- Graduate Student Schools
 - Astrophysics
 - Bioinformatics
 - Exotic Beamlines
 - Nanoscience
 - Neutron and Xray Scattering



Graduate Schools-NX School 1999-2007

- NX School at Argonne followed the GF proposal has led to other schools in the United States at LBL, LANL, and SLAC
- The schools are based on the concept of lowering the barrier for graduate student users and their “professors” and fellow students.
- Model –Two weeks Duration
 - Lectures
 - Hands-On
 - “Research Groups”
 - “Research Reports”
 - Interaction with Lecturers and Staff
 - Free Time Reserved for one day and after the school



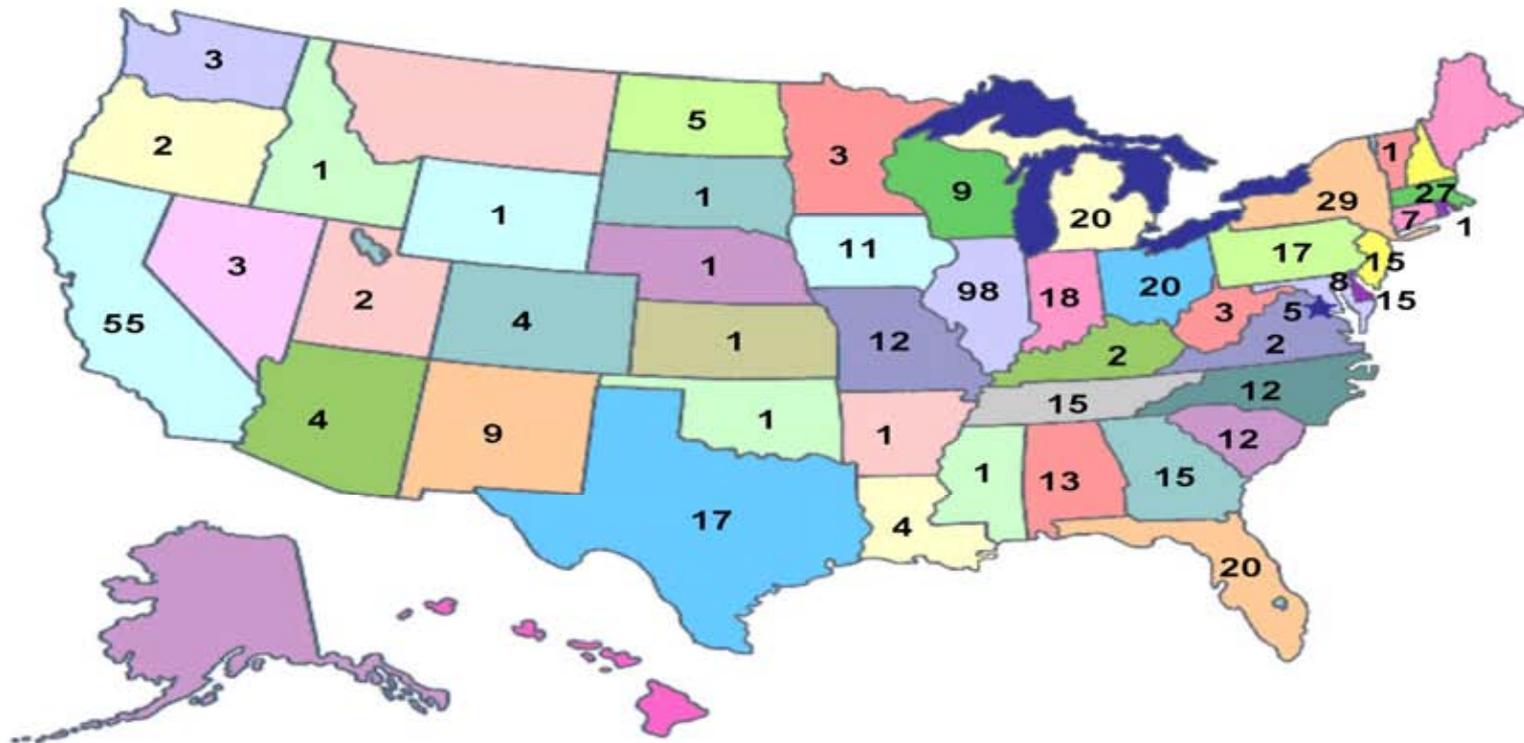
NX School Accomplishments

- 526 Graduate Students Attended from the more than 1500 applicants



NX School Accomplishments

- Students came for 46 States including DC
- Students came for 18 of 25 EPSCoR States
- Students came from 121 Distinct Colleges and Universities



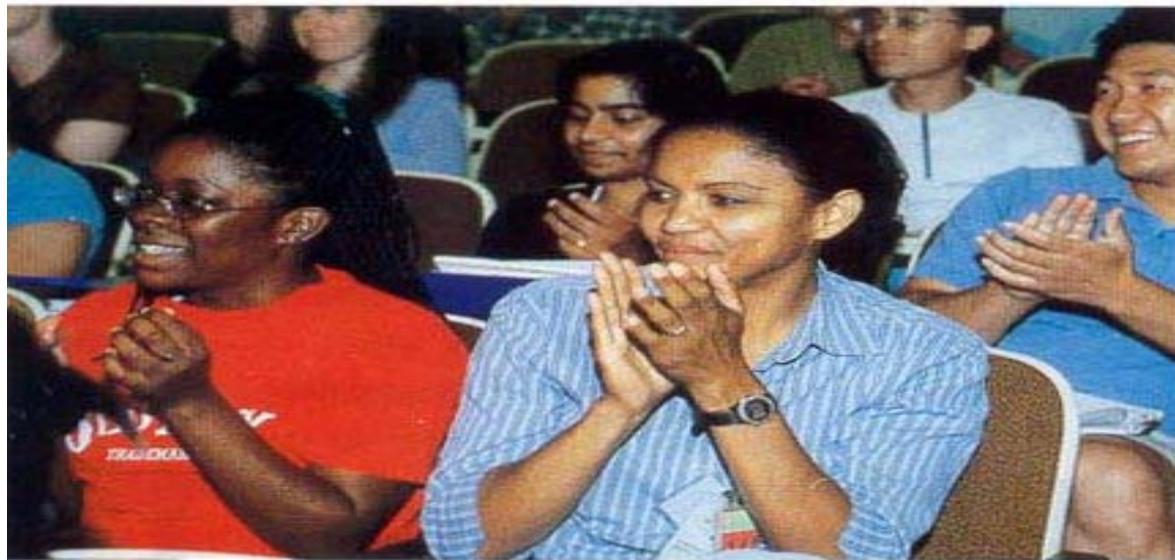
NX School Accomplishments

- School is Recognized in a Leadership Position-Front Page Neutron News



NX School Accomplishments

- 51% of former NX School students returned to utilize user facilities at Argonne
- 44% of former NX School attendees utilized user facilities at other national laboratories
- Happy Campers: Neutrons and X-rays are Fun



Enthusiastic students greeted Ice's performance with delighted applause.

Explore Argonne's Opportunities

- Argonne welcomes growing collaborations with regional and national colleges and universities
- Argonne home page: www.anl.gov
- Student/faculty programs: www.dep.anl.gov