U.S. DEPARTMENT OF ENERGY | Office of Science

Research Opportunities in the DOE Office of Science

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Office of the Deputy Director for Science Programs

American Association of State Colleges and Universities

2010 Grants Resource Center Proposal Development Workshop

February 26, 2010

Washington, D.C.

Download this talk at
http://www.science.doe.gov/SC-2/Deputy_Director-speeches-presentations.htm

Today's Agenda

- **Office of Science Overview**
- **How to Find Research Opportunities**
- **A Few Brand New Opportunities**
- **Some Ideas for Faculty Professional Development**
- **Core Research Opportunities within our Programs**

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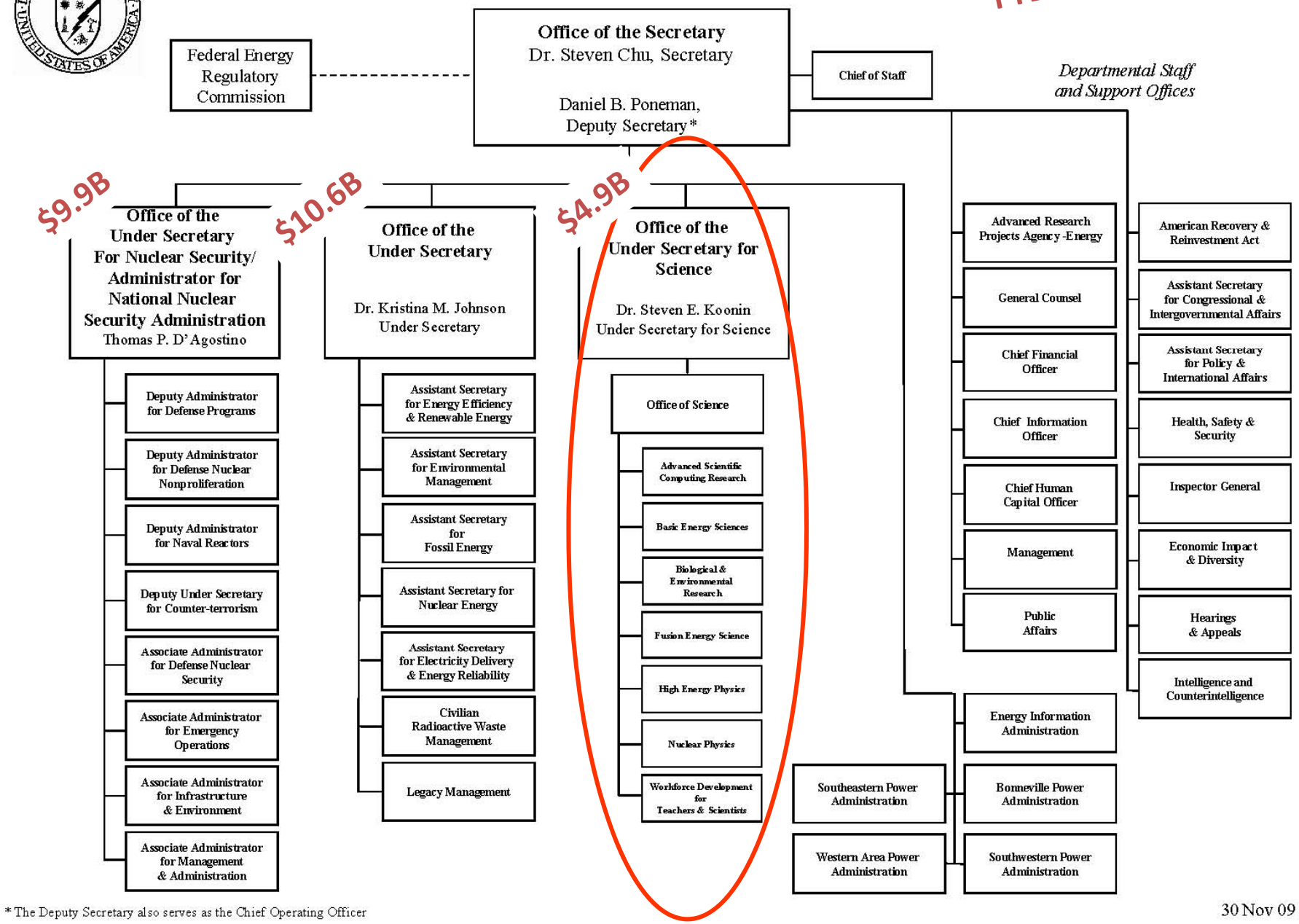
DOE Office of Science

- **The mission of the DOE Office of Science is to deliver the scientific discoveries and major scientific tools that transform our understanding of nature and advance the energy, economic, and national security of the United States.**
- **The mission is accomplished by funding**
  - **Science for Discovery**, focused on unraveling nature's mysteries—from the study of subatomic particles, atoms, and molecules that make of the materials of our everyday world to DNA, proteins, cells, and entire biological systems;
  - **Science for National Need**, focused on advancing a clean energy agenda through basic research on energy production, storage, transmission, and use; and advancing our understanding of the Earth's climate through basic research in atmospheric and environmental sciences and climate change; and
  - **National Scientific User Facilities**, the 21st century tools of science, engineering, and technology— providing the Nation's researchers with the most advanced tools of modern science including accelerators, colliders, supercomputers, light sources and neutron sources, and facilities for studying the nanoworld.

DEPARTMENT OF ENERGY

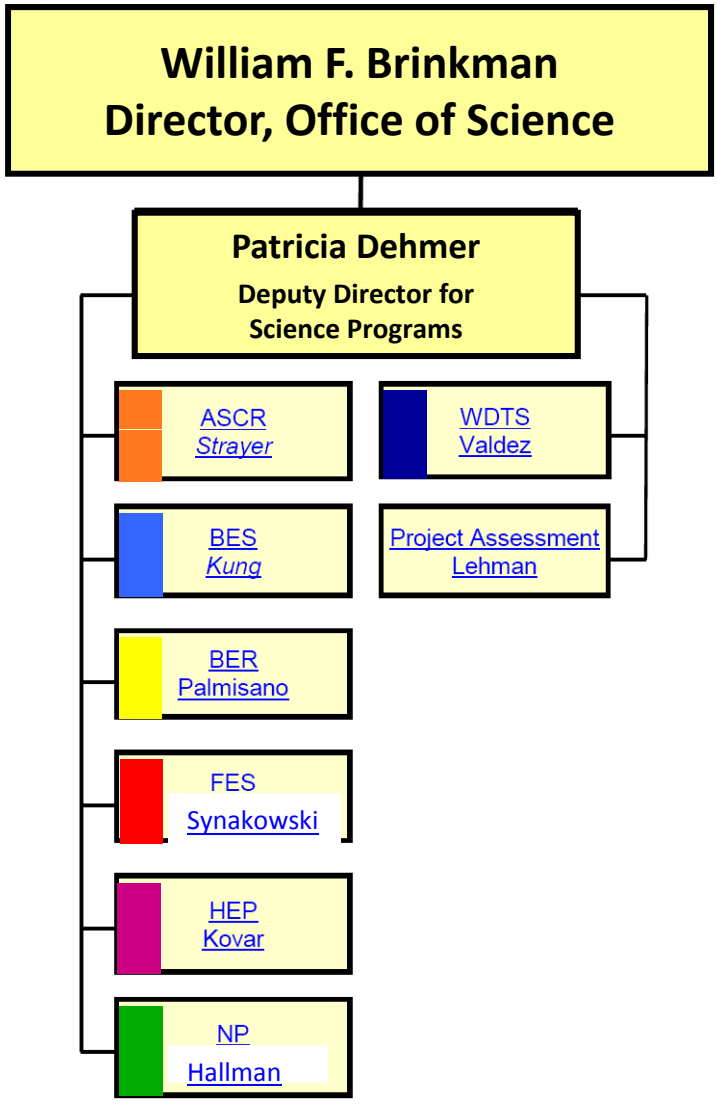
FY10 Budget



*The Deputy Secretary also serves as the Chief Operating Officer

30 Nov 09

Office of Science – the Science Programs



DOE Germantown Building, Germantown, MD

The Office of Science supports research and facilities within defined scientific programs.

Advanced Scientific Computing Research **$0.39B (FY10 Budget)**

- to discover, develop, and deploy computational and networking capabilities to analyze, model, simulate, and predict complex phenomena important to the DOE.

Biological and Environmental Research **$0.60B**

- to understand complex biological, climatic, and environmental systems across spatial and temporal scales ranging from sub-micron to global, from individual molecules to ecosystems, and from nanoseconds to millennia.

Basic Energy Sciences **$1.64B**

- to support fundamental research to understand, predict, and ultimately control matter and energy at the electronic, atomic, and molecular levels in order to provide the foundations for new energy technologies and to support the DOE mission in energy, environment, and national security.

Fusion Energy Sciences **$0.43B**

- to expand the fundamental understanding of matter at very high temperatures and densities and to develop the scientific foundations needed to develop a fusion energy source.

High Energy Physics **$0.81B**

- to understand how the universe works at its most fundamental level, which is done by discovering the elementary constituents of matter and energy, probing the interactions between them, and exploring the basic nature of space and time.

Nuclear Physics **$0.53B**

- to discover, explore, and understand all forms of nuclear matter. The fundamental particles that compose nuclear matter—quarks and gluons—are relatively well understood, but exactly how they fit together and interact to create different types of matter in the universe is still largely not understood.

Office of Workforce Development for Teachers and Scientists (WDTS)

- **Mission:**
  - **To contribute to the national effort that will ensure that DOE and the Nation have a sustained pipeline of highly skilled and diverse science, technology, engineering, and mathematics (STEM) workers.**

- *Signature Programs of WDTS*

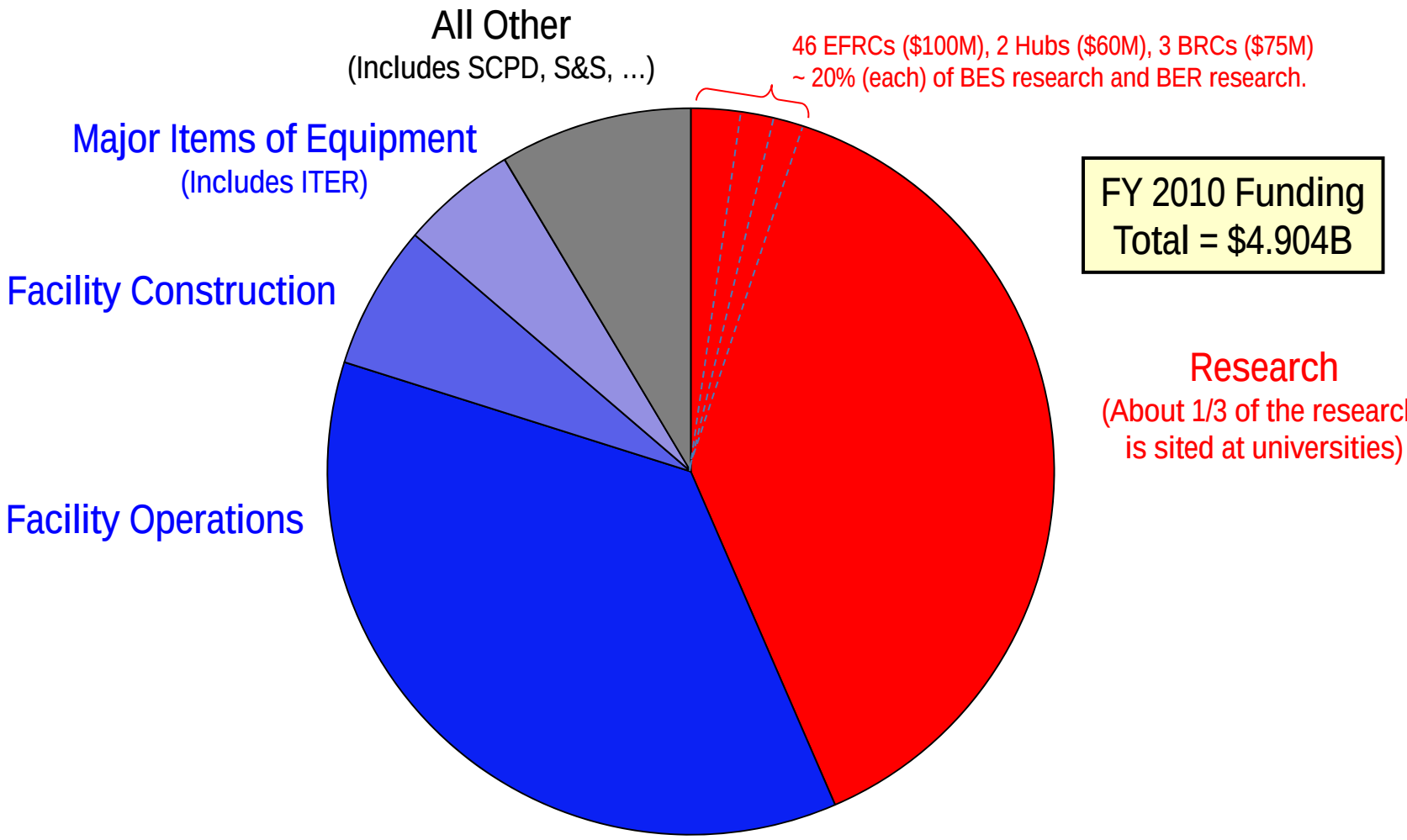
- **Graduate Students:** Office of Science Graduate Fellowship (SCGF)
- **Undergraduates:** Science Undergraduate Laboratory Internships (SULI)
- **Teachers:** Academies Creating Teacher Scientists (ACTS)
- **Faculty:** Faculty and Student Teams (FaST)
- **K-12:** National Science Bowl

FY10 Budget ~ $20M

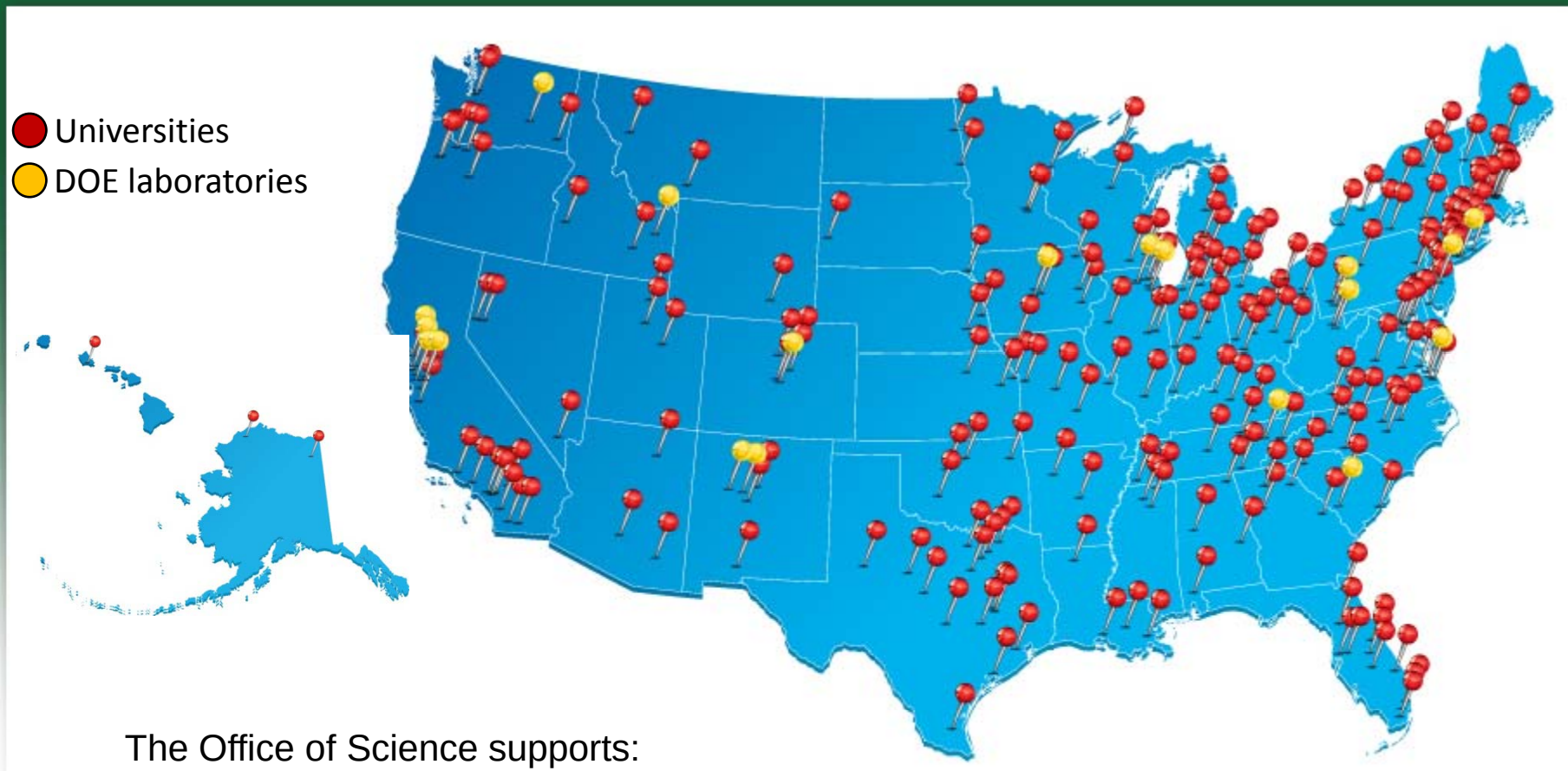
- **Director: Mr. William Valdez**

Support for Research and for Facilities

50% of our program funding supports facility operations and construction



SC Supports Research at More than 300 Institutions Across the U.S.

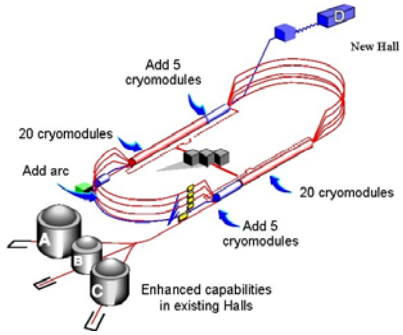


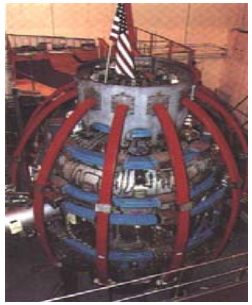
The Office of Science supports:

- 27,000 Ph.D.s, graduate students, undergraduates, engineers, and technicians
- 26,000 users of open-access facilities
- 300 leading academic institutions
- 17 DOE laboratories

Examples of our Open-Access Science User Facilities

- **Five photon (light) sources**
  - APS, ALS, NSLS, SSRL, LCLS
- **Three high-flux neutron sources**
  - SNS, HFIR, Lujan
- **Three electron beam microcharacterization centers**
  - EMCMR, NCEM, SHaRE
- **Five nanoscale science centers**
  - CNMS, MF, CINT, CFN, CNM
- **Three high-performance computing facilities**
  - NERSC, OLCF, ALCF
- **Several high-energy physics and nuclear physics facilities**
  - Tevatron, CEBAF, RHIC, ATLAS, HRIBF
- **Multiple biological and environmental facilities**
  - EMSL, JGI, ARM
- **Three fusion research facilities**
  - DIII-D, Alcator C-Mod, NSTX





- Alcator C-Mod – Fusion Tokamak operating at the at the Massachusetts Institute of Technology, Cambridge, MA
- ALCF - Argonne Leadership Computing Facility , Argonne National Laboratory, Argonne, IL
- ALS – Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA
- APS – Advanced Photon Source, Argonne National Laboratory, Argonne, IL
- ARM - Atmospheric Radiation Measurement Climate Research Facility, multiple locations
- ATLAS – Argonne Tandem Linear Accelerator System, Argonne National Laboratory, Argonne, IL
- CEBAF - Continuous Electron Beam Facility, Thomas Jefferson National Laboratory, Newport News, VA
- CFN - Center for Functional Nanomaterials, Brookhaven National Laboratory, Upton, NY
- CINT – Center for Integrated Nanotechnologies, Sandia and Los Alamos National Laboratories, NM
- CNM – Center for Nanoscale Materials, Argonne National Laboratory, Argonne, IL
- CNMS – Center for Nanophase Materials Science, Oak Ridge National Laboratory, Oak Ridge, TN
- DIII-D – Tokamak operated by General Atomics in San Diego, CA
- EMCMR - Electron Microscopy Center for Materials Research, Argonne National Laboratory, Argonne, IL
- EMSL – Environmental Molecular Sciences Laboratory, Pacific Northwest National Laboratory, Richland, WA
- HFIR – High Flux Isotope Reactor, Oak Ridge National Laboratory, Oak Ridge, TN
- HRIBF - Holifield Radioactive Ion Beam Facility, Oak Ridge National Laboratory, Oak Ridge, TN
- JGI – Joint Genome Institute, Walnut Creek, CA
- LCLS – Linac Coherent Light Source, SLAC National Accelerator Laboratory, Menlo Park, CA
- Lujan – Manuel Lujan Jr. Neutron Scattering Center, Los Alamos National Laboratory, Los Alamos, NM
- MF – Molecular Foundry, Lawrence Berkeley National Laboratory, Berkeley, CA
- NCEM - National Center for Electron Microscopy, Lawrence Berkeley National Laboratory, Berkeley, CA
- NERSC -National Energy Research Scientific Computing Center, Lawrence Berkeley National Laboratory, Berkeley, CA
- NSLS – National Synchrotron Light Source, Brookhaven National Laboratory, Upton, NY
- NSTX - National Spherical Torus Experiment, Princeton Plasma Physics Laboratory, Princeton, NJ
- OLCF - Oak Ridge Leadership Computing Facility, Oak Ridge National Laboratory, Oak Ridge, TN
- RHIC – Relativistic Heavy Ion Collider, Brookhaven National Laboratory, Upton, NY
- SHaRE - Shared Research Equipment User Facility, Oak Ridge National Laboratory, Oak Ridge, TN
- SNS – Spallation Neutron Source, Oak Ridge National Laboratory, Oak Ridge, TN
- SSRL – Stanford Synchrotron Radiation Laboratory, SLAC National Accelerator Laboratory, Menlo Park, CA
- Tevatron Accelerator, Fermi National Accelerator Laboratory, Batavia, IL

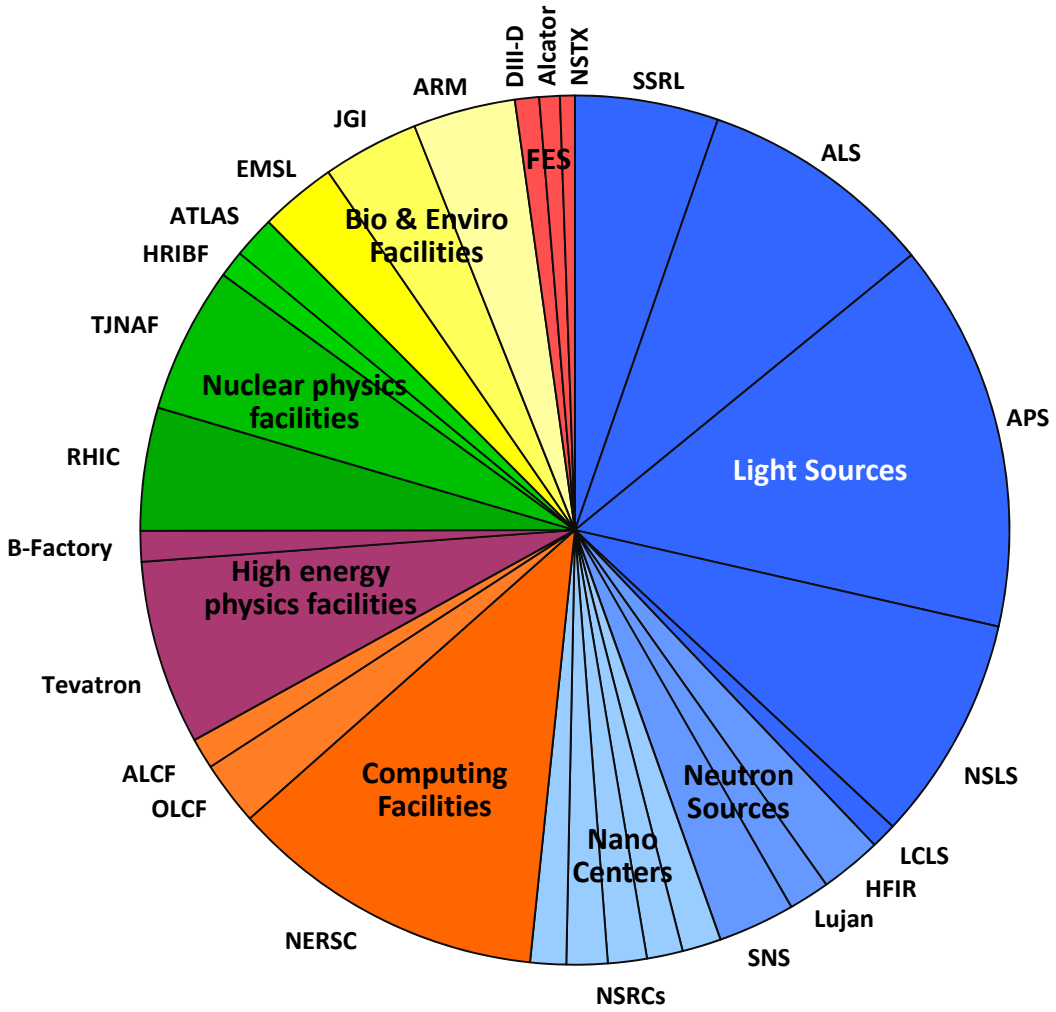
SC Supports World-Leading, Open Access Scientific User Facilities

User numbers continue to increase with more than 26,000 users expected in FY 2011

Numbers of Users at SC Facilities

	FY 2009	FY 2010 (Est)	FY 2011 (Est)
ASCR	3,696	3,850	4,025
BES	11,509	12,780	13,560
BER	2,716	2,690	2,690
FES	542	575	580
HEP	2,960	2,600	2,100
NP	3,170	3,260	3,300
Total	24,593	25,755	26,255

Breakdown of the expected users in FY 2011 by facility.



Office of Science (SC) FY 2011 Budget Request to Congress

(B/A in thousands)

	FY 2009		FY 2010	FY 2011		
	Current Base Approp.	Current Recovery Act	Current Approp.	Request to Congress	Request to Congress vs. FY 2010 Approp.	
Advanced Scientific Computing Research	358,772	161,795	394,000	426,000	+32,000	+8.1%
Basic Energy Sciences	1,535,765	555,406	1,636,500	1,835,000	+198,500	+12.1%
Biological & Environmental Research	585,176	165,653	604,182	626,900	+22,718	+3.8%
Fusion Energy Sciences	394,518	91,023	426,000	380,000	-46,000	-10.8%
High Energy Physics	775,868	232,390	810,483	829,000	+18,517	+2.3%
Nuclear Physics	500,307	154,800	535,000	562,000	+27,000	+5.0%
Workforce Development for Teachers & Scientists	13,583	12,500	20,678	35,600	+14,922	+72.2%
Science Laboratories Infrastructure	145,380	198,114	127,600	126,000	-1,600	-1.3%
Safeguards & Security	80,603	——	83,000	86,500	+3,500	+4.2%
Science Program Direction	186,695	5,600	189,377	214,437	+25,060	+13.2%
Small Business Innovation Research/Technology Transfer (SC)	104,905	18,719	——	——	——	——
Subtotal, Science	**4,681,572**	**1,596,000**	**4,826,820**	**5,121,437**	**+294,617**	**+6.1%**
Congressionally-directed projects	91,064	——	76,890	——	-76,890	-100.0%
Small Business Innovation Research/ Technology Transfer (DOE)	49,534	36,918	——	——	——	——
Use of prior year balances	-15,000	——	——	——	——	——
Total, Office of Science	**4,807,170**	**1,632,918**	**4,903,710**	**5,121,437**	**+217,727**	**+4.4%**

All research funded at laboratories and universities, including facilities construction and operations, is awarded using peer review.

Merit Review Criteria*:

- **Scientific and/or technical merit of the project**
- **Appropriateness of the proposed method or approach**
- **Competency of the personnel and adequacy of proposed resources**
- **Reasonableness and appropriateness of the proposed budget**

- *** From 10 C.F.R. 605**

The Office of Science has ~3000 active grants, entertaining ~2000 new and renewal applications per year.

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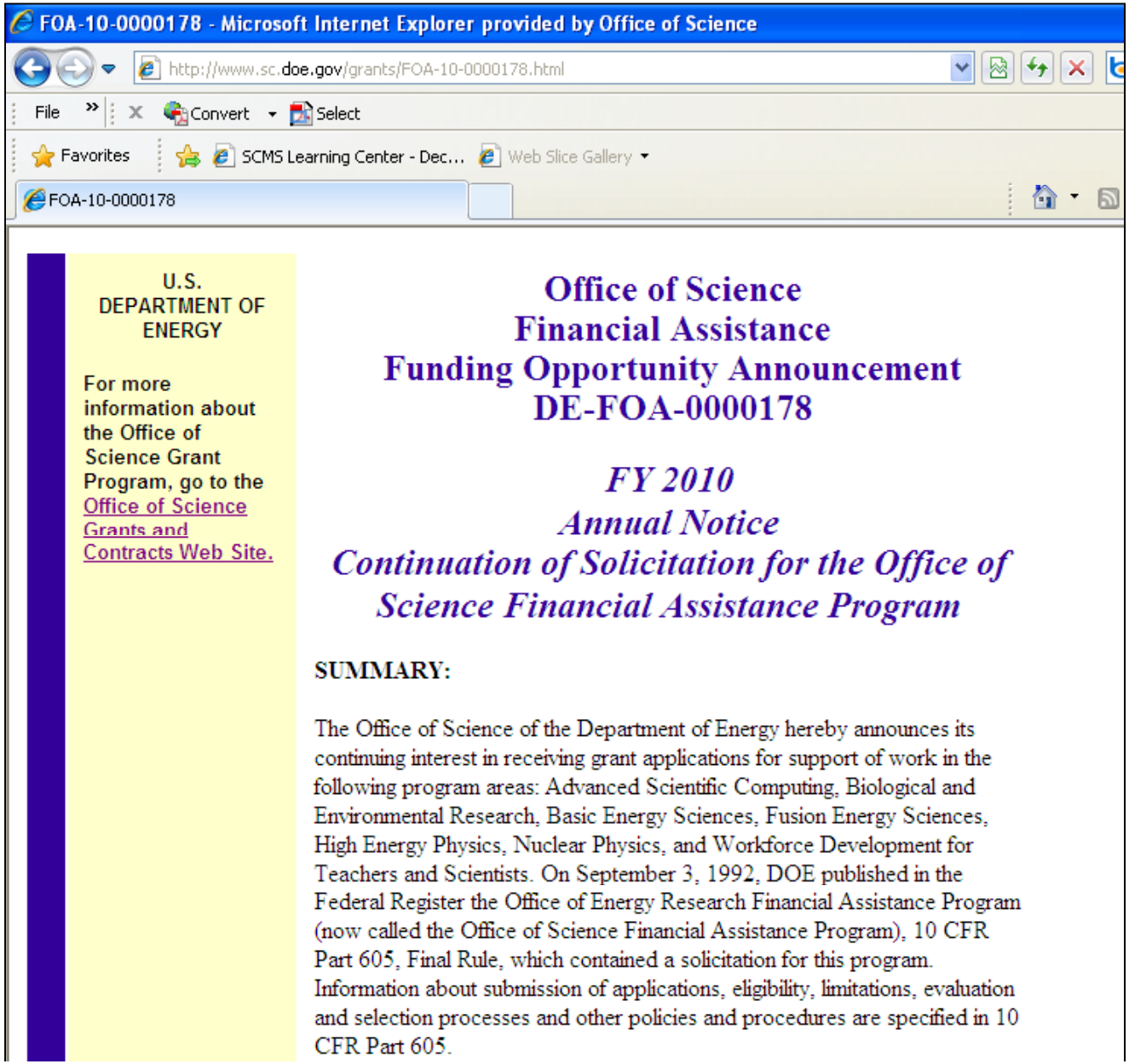
- A Few Brand New Opportunities
- Some Ideas for Faculty Professional Development
- Core Research Opportunities within our Programs

Annual Open Solicitation
http://www.sc.doe.gov/grants/grants.html



Open throughout the year.

Funding Opportunity Announcements can be more specific, too. (The Office of Science issues about 40 FOAs per year.)

Submission is through Grants.gov.

Recent Examples of Topical Solicitations: Watch

http://www.sc.doe.gov/grants for future opportunities

Research in Integrated Assessment Inter-Model Development, Testing and Diagnostics. DE-FOA-0000219 . Posted December 8, 2009. Preapplications by January 11, 2010. Formal applications by March 1, 2010.

Regional and Global Climate Modeling Program: Modes of Low Frequency Variability in a Changing Climate. DE-FOA-0000242. Posted January 21, 2010. Preapplications by February 18, 2010. Formal applications by April 12, 2010.

Theoretical Research in Magnetic Fusion Energy Science. DE-FOA-0000252. Posted January 28, 2010. Preapplications by February 22, 2010. Formal applications by April 5, 2010.

Advanced Architectures and Critical Technologies for Exascale Computing. DE-FOA-0000255. Posted January 29, 2010. Formal applications by March 26, 2010.

Scientific Data Management and Analysis at Extreme Scale. DE-FOA-0000256. Posted January 29, 2010. Formal applications by March 18, 2010.

X-Stack Software Research. DE-FOA-0000257. Posted January 29, 2010. Formal applications by April 2, 2010.

High-Capacity Optical Networking and Deeply Integrated Middleware Services for Distributed Petascale Science. DE-FOA-0000264 . Posted February 4, 2010. Formal applications by April 23, 2010.

Radiochemistry and Radionuclide Imaging Instrumentation Research. DE-FOA-0000265. Posted February 2, 2010. Preapplications by March 9, 2010. Formal applications by April 19, 2010.

More information on funding opportunities can be found on the program websites.

- **Advanced Scientific Computing Research**
  - http://www.sc.doe.gov/ascr/index.html
- **Basic Energy Sciences**
  - http://www.sc.doe.gov/bes/bes.html
- **Biological and Environmental Research**
  - http://www.sc.doe.gov/ober/ober_top.html
- **Fusion Energy Sciences**
  - http://www.science.doe.gov/ofes/
- **High Energy Physics**
  - http://www.science.doe.gov/hep/index.shtm
- **Nuclear Physics**
  - http://www.sc.doe.gov/np/index.shtml
- **Workforce Development for Teachers and Scientists**
  - http://www.scied.science.doe.gov/scied/sci_ed.htm

The Office of Science develops programs and plans within the context of the DOE mission and in concert with the science community.

- **Research areas are identified using federal advisory committees, program and topical workshops, interagency groups, National Academies' studies, and open and targeted solicitations.**

University researchers can become involved in many ways.

- **Read about the core research areas on our websites and contact program managers to discuss whether your ideas fit within their programs.**
- **Volunteer to become a reviewer or participate in a workshop.**
- **Incorporate our large scientific user facilities into your research. Apply to compete for time at one of them.**
- **Follow federal advisory committee meetings.**
- **Respond to open and topical solicitations.**

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Office of Science Early Career Research Program

Purpose: To support individual research programs of outstanding scientists early in their careers and to stimulate research careers in the disciplines supported by the Office of Science

Eligibility: Within 10 years of receiving a Ph.D., either untenured academic assistant professors on the tenure track or full-time DOE national lab employees

Award Size:

- University grants $150,000 per year for 5 years to cover summer salary & expenses
- National lab awards $500,000 per year for five years to cover full salary & expenses

FY 2010 (Inaugural Year) Results:

- 69 awards funded via the American Recovery and Reinvestment Act
- 1,750 proposals peer reviewed to select the awardees
- 47 university grants and 22 DOE national laboratory awards
- Awardees are from 44 separate institutions in 20 states

FY 2011 Plans:

- Funding Opportunity Announcement to be issued in Spring 2010
- We plan to bring about 60 new scientists into the program in FY2011.

http://www.science.doe.gov/SC-2/early_career.htm

DOE Office of Science Graduate Fellowships

Purpose: To educate and train a skilled scientific and technical workforce to stay at the forefront of science and innovation and to meet our energy and environmental challenges

Eligibility:

- U.S. citizens and a senior undergraduate or first or second year graduate student pursuing advanced degrees in areas of physics, chemistry, mathematics, biology, computational sciences, areas of climate and environmental sciences important to the Office of Science and DOE mission

Award Size:

- The three-year fellowship award, totaling $50,500 annually, provides support towards tuition, a stipend for living expenses, and support for expenses such as travel to conferences and to DOE user facilities.

FY 2010 Results:

- About 160 awards will be made this Spring with FY 2010 and American Recovery and Reinvestment Act funds.

FY 2011 Plans:

- Funding Opportunity Announcement to be issued issued in Fall 2010
- We plan to bring about 170 new students into the program in FY2011.

http://www.scied.science.doe.gov/SCGF.html

DOE Energy Innovation Hubs

Three new Hubs are launched in FY 2010 with SC leading the Fuels from Sunlight Hub

Modeled after the Office of Science Bioenergy Research Centers, the Energy Innovation Hubs focus on critical energy technology challenges by building creative, highly-integrated research teams that can accomplish more, faster, than researchers working separately.

FY 2010 Hubs tackle three important energy challenges:

1. **Production of fuels directly from sunlight (SC)**
2. **Energy-efficient building systems design (EERE)**
3. **Modeling and simulation of advanced nuclear reactors (NE)**

The Fuels from Sunlight Hub will accelerate the development of a sustainable commercial process for the conversion of sunlight directly into energy-rich chemical fuels, likely mimicking photosynthesis, the method used by plants to convert sunlight, carbon dioxide, and water into sugar. The FOA DE-FOA-0000214 was released on 12/22/2009, and proposals are due on 3/29/2010.

For more information on these three opportunities:
http://www.energy.gov/hubs/

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There are several opportunities for faculty members to participate outside of the grant process.

- **Faculty members can assist our program managers at DOE headquarters as one-year rotators (Intergovernmental Personnel Act).**
  - Contact a division director about opportunities. (See organization charts at the end of this slide pack.)
- **Apply for time to perform research at a user facility.**
  - More than half of facility users come from universities.
- **Develop a collaboration with a Principal Investigator who works at a DOE national lab.**
  - Our labs are operated by contractors but owned by DOE, so local lab policies may vary.
- **The Office of Workforce Development for Teachers and Scientists (WDTS) manages a program known as Faculty and Student Teams (FAST).**

Faculty & Student Teams Program

- Research opportunity at DOE national laboratories for faculty and students from colleges and universities, including community colleges and tribal colleges, that are below the 50th percentile in receipt of Federal R&D funding
- Faculty and students come as a team and work closely with senior mentor scientists on a research project.

Faculty & Student Teams Program

- Faculty apply to a specific research project at one of the DOE national laboratories at the following website: **http://www.scied.science.doe.gov/scied/fast/about.html**
- Faculty select 2 or 3 students to be part of the team
- Application opens October 1 each year and the laboratories begin selections February 1
- DOE provides stipend, travel and lodging for the 10 week experience

Fifty faculty will be supported in FY 2010 with a ~$1M budget. The plan is to support about 60 faculty in FY11.

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- **Core Research Opportunities within our Programs**

For each core program, the following items are included in the next few slides:

Mission statement and research areas
Highlight of the existing program or of a planned opportunity
Organizational chart for identifying program managers
(DOE phone book: http://phonebook.doe.gov/)

Advanced Scientific Computing Research (ASCR)

Mission:

To discover, develop, and deploy computational and networking capabilities to analyze, model, simulate, and predict complex phenomena important to the DOE.

A particular challenge of this program is fulfilling the science potential of emerging multi-core computing systems and other novel "extreme-scale" computing architectures, which will require significant modifications to today's tools and techniques.

Research Areas:

Applied Mathematics
Computer Science
Computational Science
Network-Environment Research

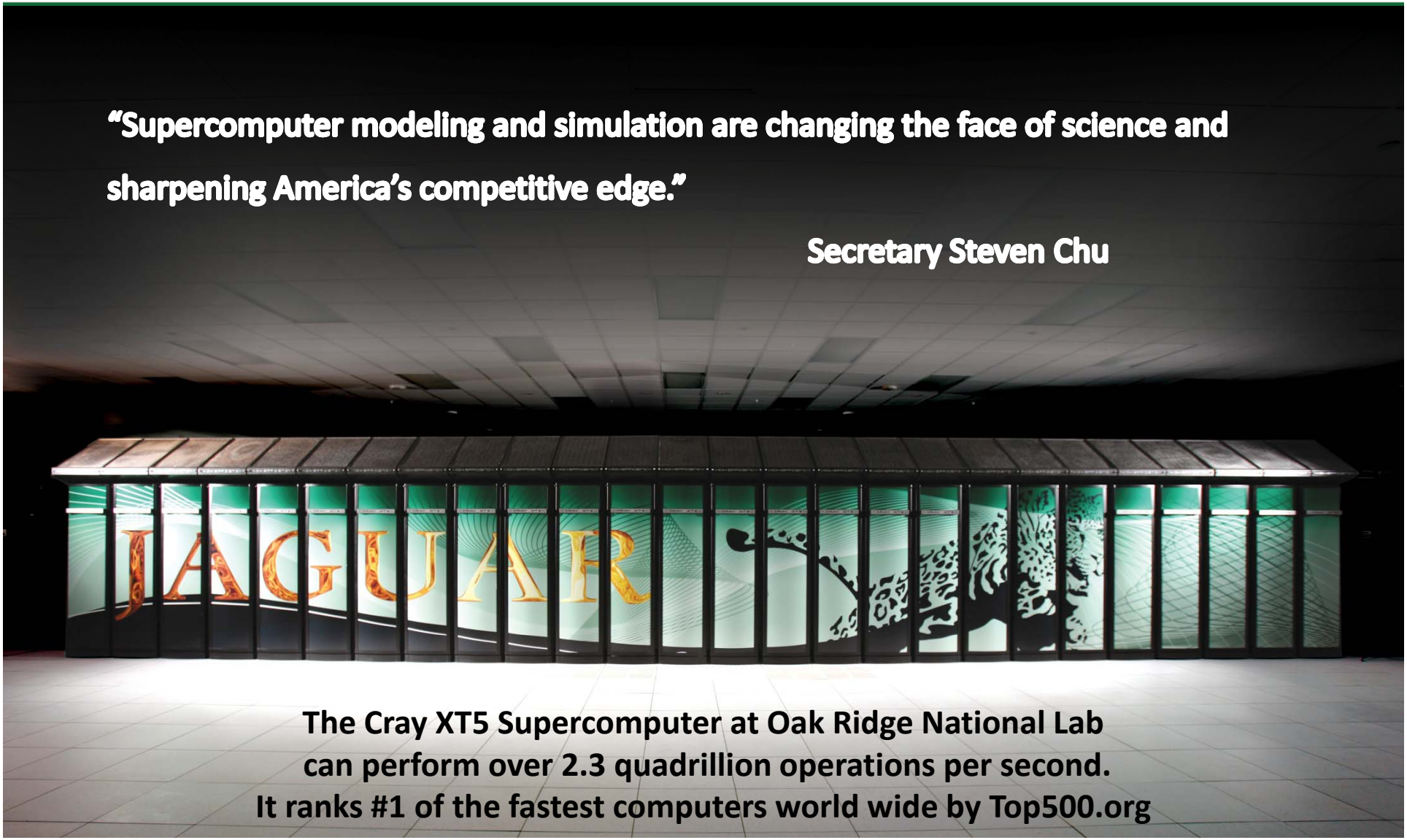
- **Director: Dr. Michael Strayer**

Leadership Computing Facilities

The Office of Science leads the World in supercomputing capabilities

"Supercomputer modeling and simulation are changing the face of science and sharpening America's competitive edge."

Secretary Steven Chu

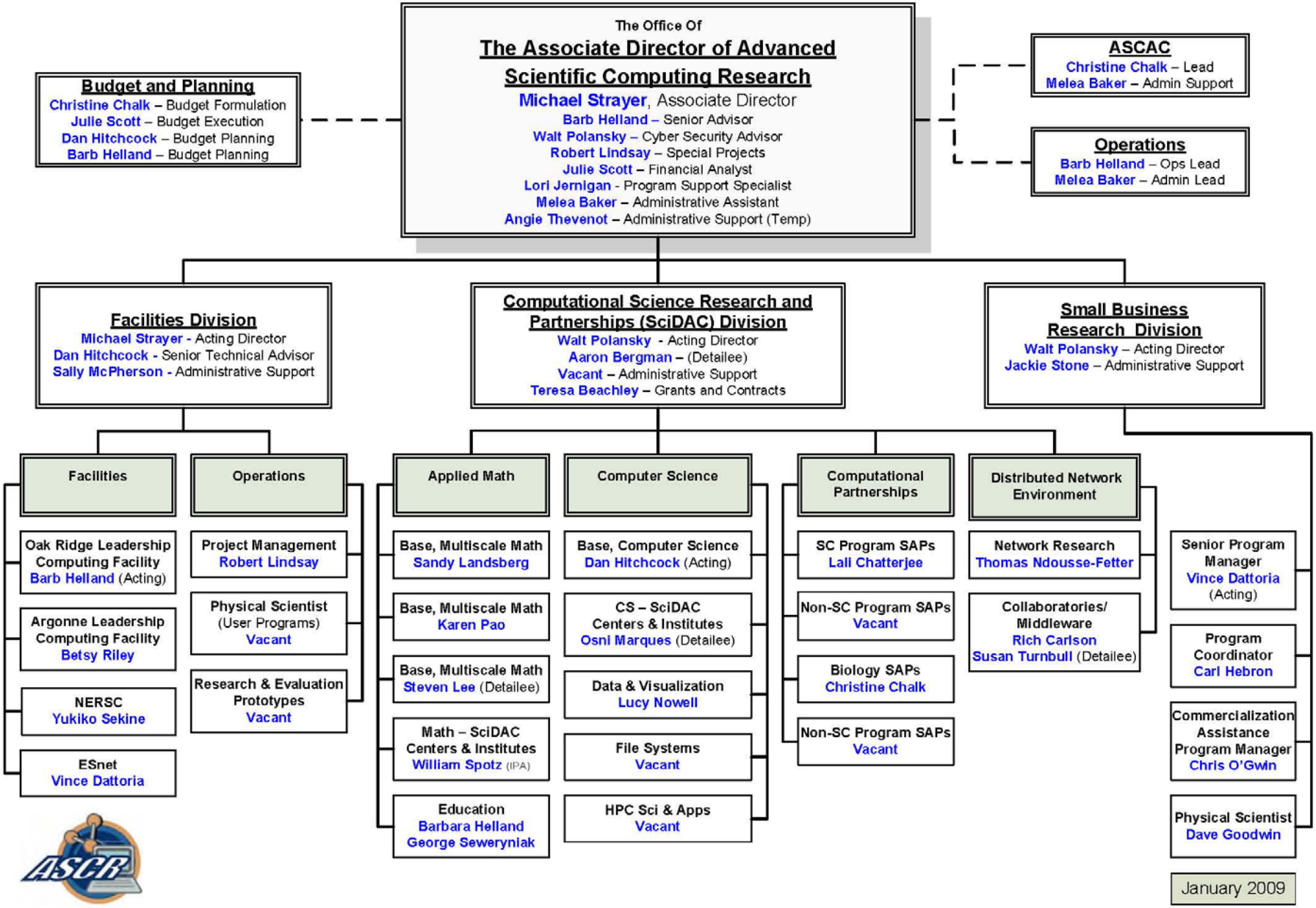


The Cray XT5 Supercomputer at Oak Ridge National Lab can perform over 2.3 quadrillion operations per second. It ranks #1 of the fastest computers world wide by Top500.org

THE OFFICE OF

ADVANCED SCIENTIFIC COMPUTING RESEARCH

Functional Organization Chart



Biological and Environmental Research (BER)

Mission:

To understand complex biological, climatic, and environmental systems across spatial and temporal scales ranging from sub-micron to global, from individual molecules to ecosystems, and from nanoseconds to millennia.

This is accomplished by exploring the frontiers of genome-enabled biology; discovering the physical, chemical, and biological drivers of climate change; and seeking the geochemical, hydrological, and biological determinants of environmental sustainability and stewardship.

Research Areas:

- **Biological Systems Science**
- **Climate and Environmental Sciences**

Director: Dr. Anna Palmisano

Climate Science for a Sustainable Energy Future

Enhanced activities in climate research to improve our predictive capability

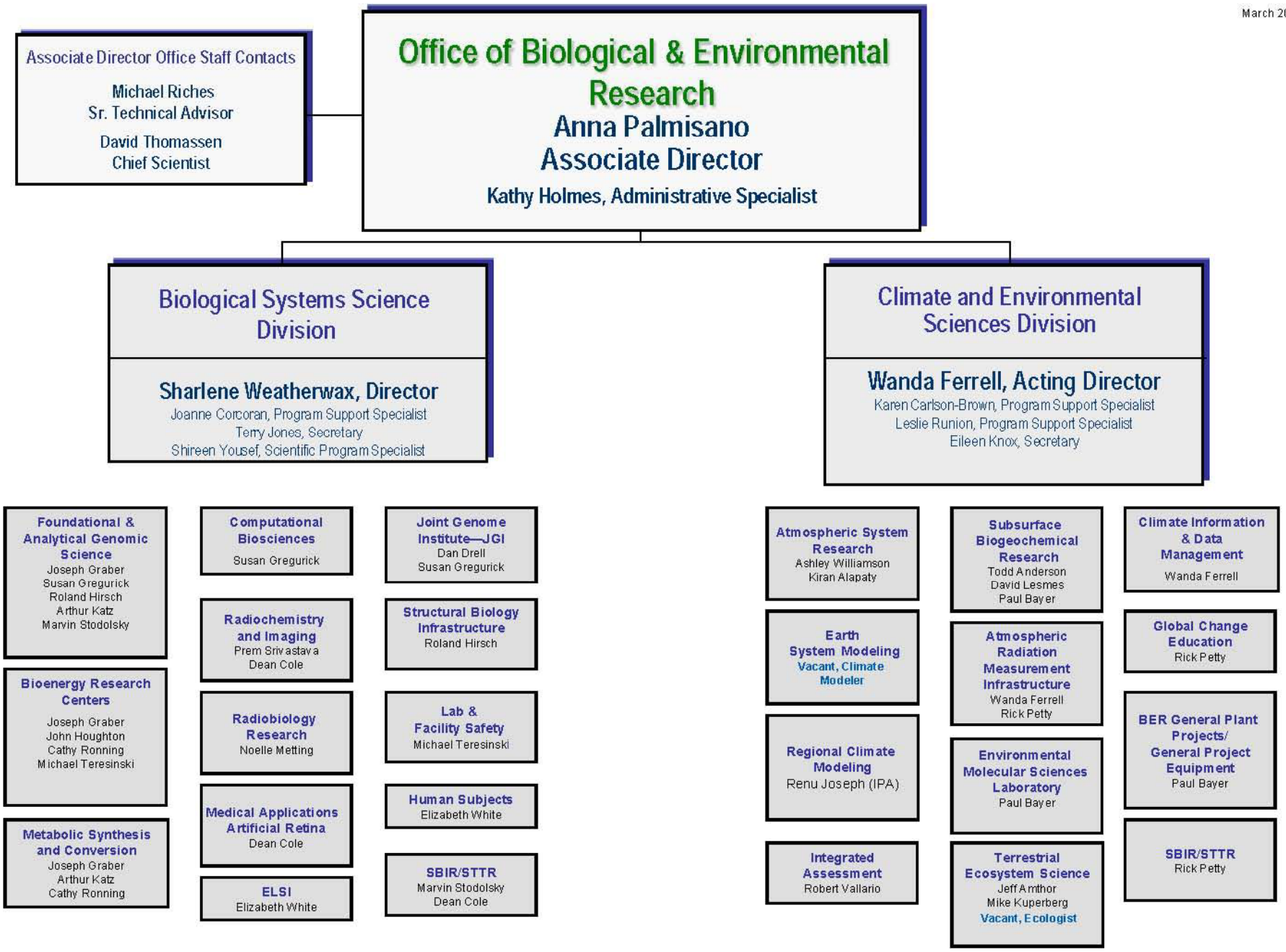
The demands on climate change modeling to inform policy and investment decisions are increasing. The current state of climate models is insufficient to predict with the detail and accuracy the future interactions between climate change and energy policy.

Requested FY 2011 funding increases support in BER for the development of a predictive capability that will rapidly incorporate new science into state-of-the-art climate models and that will improve uncertainty quantification.

New and enhanced activities will emphasize:

- Research and atmospheric data collection for improving representation of the feedbacks produced by the indirect effect of aerosols
- Enhanced uncertainty quantification for climate model simulations and predictions
- Conversion of observational data sets into specialized, multi-variable data sets for Earth System Model testing and improvement.
- Model development testbeds in which model components can be rapidly prototyped and evaluated using integrated observational datasets; development of numerical methods to enable climate models to use future computer architectures
- Atmospheric System Research and operation of new ARM Climate Research Facility instruments to provide data for improving representation of clouds and aerosols in climate models

March 2010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Eileen Knox, Secretary
Foundational & Analytical Genomic Science
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Susan Gregurick
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Prem Srivastava
Dean Cole
Radiobiology Research
Noelle Metting
Medical Applications Artificial Retina
Dean Cole
ELSI
Elizabeth White
Joint Genome Institute—JGI
Dan Drell
Susan Gregurick
Structural Biology Infrastructure
Roland Hirsch
Lab & Facility Safety
Michael Teresinski
Human Subjects
Elizabeth White
SBIR/STTR
Marvin Stodolsky
Dean Cole
Atmospheric System Research
Ashley Williamson
Kiran Alapaty
Earth System Modeling
Vacant, Climate Modeler
Regional Climate Modeling
Renu Joseph (IPA)
Integrated Assessment
Robert Vallario
Subsurface Biogeochemical Research
Todd Anderson
David Lesmes
Paul Bayer
Atmospheric Radiation Measurement Infrastructure
Wanda Ferrell
Rick Petty
Environmental Molecular Sciences Laboratory
Paul Bayer
Terrestrial Ecosystem Science
Jeff Amthor
Mike Kuperberg
Vacant, Ecologist
Climate Information & Data Management
Wanda Ferrell
Global Change Education
Rick Petty
BER General Plant Projects/ General Project Equipment
Paul Bayer
SBIR/STTR
Rick Petty

Basic Energy Sciences (BES)

Mission:

To support fundamental research to understand, predict, and ultimately control matter and energy at the electronic, atomic, and molecular levels in order to provide the foundations for new energy technologies and to support DOE missions in energy, environment, and national security.

Research Areas:

- **Materials Sciences and Engineering**
- **Chemical Sciences, Geosciences, and Biosciences**
- **Scientific User Facilities-Related Research**

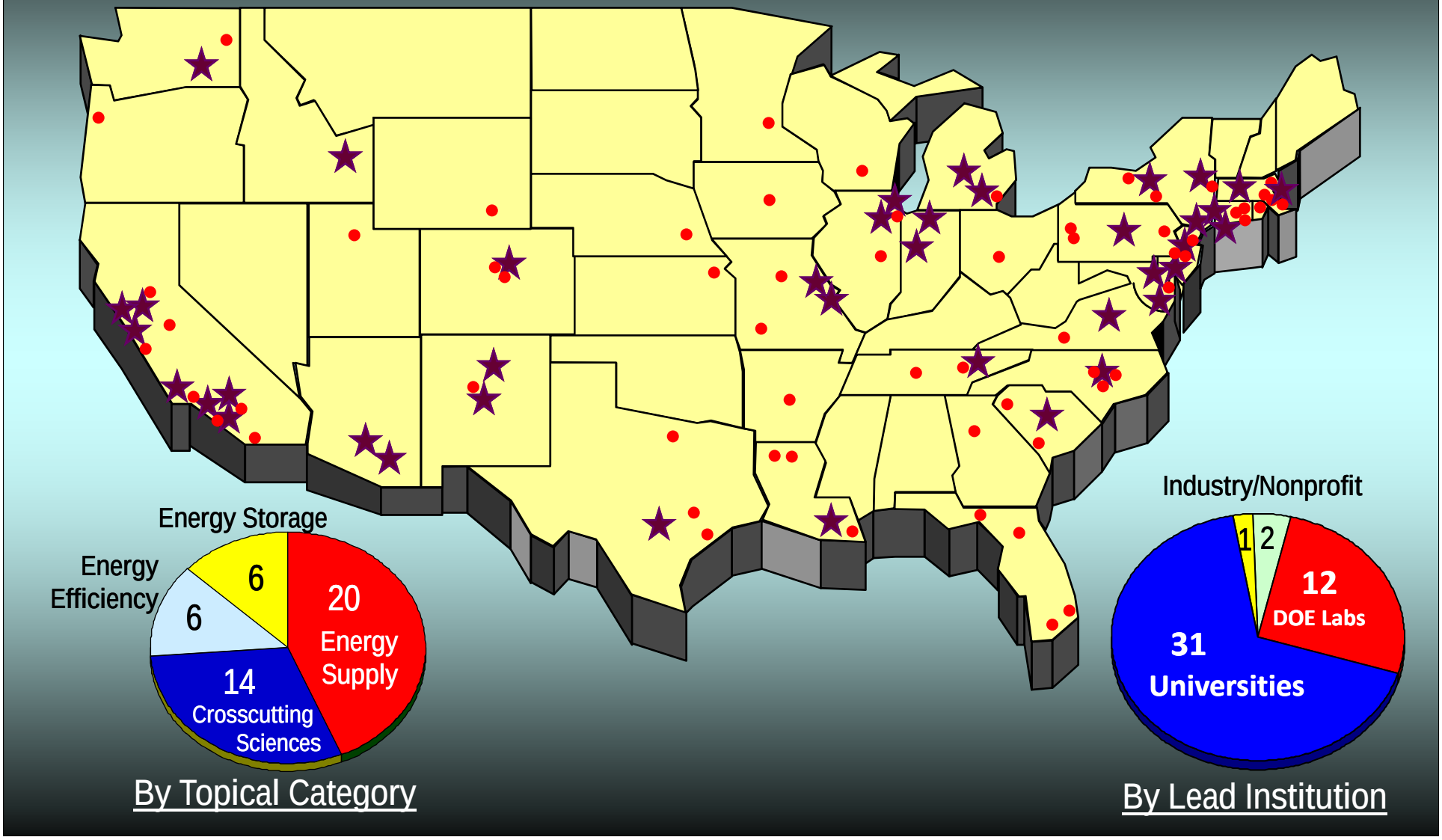
Director: Dr. Harriet Kung

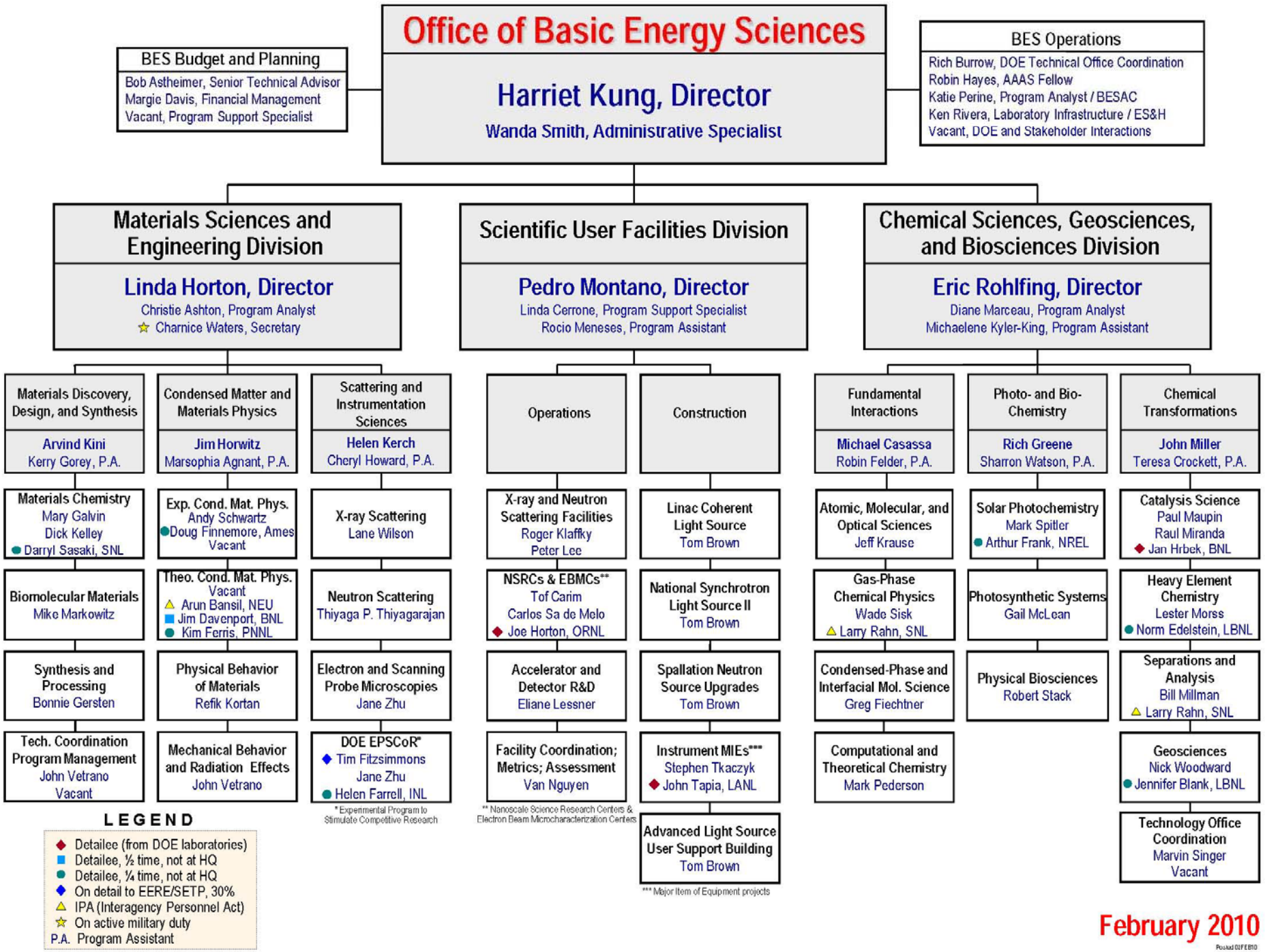
The Status of the SC/BES Energy Frontier Research Centers

46 EFRCs were launched in late FY 2009 using FY 2009 Appropriations and Recovery Act Funds

46 centers awarded, representing 103 participating institutions in 36 states plus D.C

Energy Frontier Research Center Locations (★ Leads; • Participants)




Office of Basic Energy Sciences
Harriet Kung, Director
Wanda Smith, Administrative Specialist
BES Budget and Planning
Bob Astheimer, Senior Technical Advisor
Margie Davis, Financial Management
Vacant, Program Support Specialist
BES Operations
Rich Burrow, DOE Technical Office Coordination
Robin Hayes, AAAS Fellow
Katie Perine, Program Analyst / BESAC
Ken Rivera, Laboratory Infrastructure / ES&H
Vacant, DOE and Stakeholder Interactions
Materials Sciences and Engineering Division
Linda Horton, Director
Christie Ashton, Program Analyst
☆ Charnice Waters, Secretary
Scientific User Facilities Division
Pedro Montano, Director
Linda Cerrone, Program Support Specialist
Rocio Meneses, Program Assistant
Chemical Sciences, Geosciences, and Biosciences Division
Eric Rohlfing, Director
Diane Marceau, Program Analyst
Michaelene Kyler-King, Program Assistant
Materials Discovery, Design, and Synthesis
Arvind Kini
Kerry Gorey, P.A.
Materials Chemistry
Mary Galvin
Dick Kelley
● Darryl Sasaki, SNL
Biomolecular Materials
Mike Markowitz
Synthesis and Processing
Bonnie Gersten
Tech. Coordination Program Management
John Vetrano
Vacant
Condensed Matter and Materials Physics
Jim Horwitz
Marsophia Agnant, P.A.
Exp. Cond. Mat. Phys.
Andy Schwartz
●Doug Finnemore, Ames
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Theo. Cond. Mat. Phys.
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△ Arun Bansil, NEU
■ Jim Davenport, BNL
● Kim Ferris, PNNL
Physical Behavior of Materials
Refik Kortan
Mechanical Behavior and Radiation Effects
John Vetrano
Scattering and Instrumentation Sciences
Helen Kerch
Cheryl Howard, P.A.
X-ray Scattering
Lane Wilson
Neutron Scattering
Thiyaga P. Thiyagarajan
Electron and Scanning Probe Microscopies
Jane Zhu
DOE EPSCoR*
◆ Tim Fitzsimmons
Jane Zhu
● Helen Farrell, INL
* Experimental Program to Stimulate Competitive Research
Operations
X-ray and Neutron Scattering Facilities
Roger Klaffky
Peter Lee
NSRCs & EBMCs**
Tof Carim
Carlos Sa de Melo
◆ Joe Horton, ORNL
Accelerator and Detector R&D
Eliane Lessner
Facility Coordination; Metrics; Assessment
Van Nguyen
** Nanoscale Science Research Centers & Electron Beam Microcharacterization Centers
Construction
Linac Coherent Light Source
Tom Brown
National Synchrotron Light Source II
Tom Brown
Spallation Neutron Source Upgrades
Tom Brown
Instrument MIEs***
Stephen Tkaczyk
◆ John Tapia, LANL
Advanced Light Source User Support Building
Tom Brown
*** Major Item of Equipment projects
Fundamental Interactions
Michael Casassa
Robin Felder, P.A.
Atomic, Molecular, and Optical Sciences
Jeff Krause
Gas-Phase Chemical Physics
Wade Sisk
△ Larry Rahn, SNL
Condensed-Phase and Interfacial Mol. Science
Greg Fiechtner
Computational and Theoretical Chemistry
Mark Pederson
Photo- and Bio-Chemistry
Rich Greene
Sharron Watson, P.A.
Solar Photochemistry
Mark Spitler
● Arthur Frank, NREL
Photosynthetic Systems
Gail McLean
Physical Biosciences
Robert Stack
Chemical Transformations
John Miller
Teresa Crockett, P.A.
Catalysis Science
Paul Maupin
Raul Miranda
◆ Jan Hrbek, BNL
Heavy Element Chemistry
Lester Morss
● Norm Edelstein, LBNL
Separations and Analysis
Bill Millman
△ Larry Rahn, SNL
Geosciences
Nick Woodward
● Jennifer Blank, LBNL
Technology Office Coordination
Marvin Singer
Vacant
LEGEND
◆ Detailee (from DOE laboratories)
■ Detailee, ½ time, not at HQ
● Detailee, ¼ time, not at HQ
◆ On detail to EERE/SETP, 30%
△ IPA (Interagency Personnel Act)
☆ On active military duty
P.A. Program Assistant
February 2010
Posted 02FEB10

Fusion Energy Sciences (FES)

Mission:

To expand the fundamental understanding of matter at very high temperatures and densities and to develop the scientific foundations needed to develop a fusion energy source.

This is accomplished by studying plasmas and their interactions with their surroundings under a wide range of temperature and density, developing advanced diagnostics to make detailed measurements of their properties, and creating theoretical and computational models to resolve the essential physics.

Research Areas:

Fusion Science

Enabling Research and Development

Director: Dr. Edmund Synakowski

High Energy Density Laboratory Plasmas

The emerging science of high energy density laboratory plasma (HEDLP) — the study of ionized matter at extremely high density and temperature — is enabling deeper understanding of extreme phenomena in a range of disciplines including fusion energy science, condensed matter physics, materials science, fluid dynamics, nuclear science, and astrophysics.

A requested FY2011 increase in the FES High Energy Density Laboratory Plasma program will enable new research awards under the HEDLP joint program between FES and NNSA, which began in FY 2009.

This research will leverage world-class FES and NNSA facilities to provide:

- information in assessing the viability of inertial fusion energy as a future energy source;
- first-of-kind laboratory studies of astrophysical phenomena that include testing of models used to infer the age of the universe; and
- opportunities for junior researchers to ensure continued excellence in scientific disciplines closely aligned with fusion energy science and stockpile stewardship.

Office of Fusion Energy Sciences

Edmund Synakowski
Associate Director of Science for Fusion Energy Sciences

Al Opdenaker
Executive Assistant, Strategic Planning Systems Studies

Shahida Afzal
Administrative Specialist

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Manager

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Theory Team Leader

Michael Crisp
General Plasma Science, Theory Team

Vacant
Alcator C-Mod Deputy Leader Theory Team

Steve Eckstrand
NSTX, Fusion Simulation Project

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DIII-D Site Rep.

T.V. George
Innovative Confinement Concepts Program, MST

John Mandrekas
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Darlene Markevich
Diagnostics, University Liaison, Education, Outreach

Gene Nardella
Technology Team Leader

Erol Oktay
D III – D, International Tokamaks

Nirmol Podder
NSTX

Barry Sullivan
NCSX Project Management, ESH, Fac. Ops. Upgrades, Heating and Fueling; SBIR/STTR

Francis Thio
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Mark Koepke
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ITER & International Division

Erol Oktay, Acting Director

Tom Vanek, Senior Policy Advisor

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Jeff Hoy
U.S. ITER Program Manager

Debra Frame
International Administration

John Glowienka
ITER Assistant Program Manager

Gene Nardella
ITER Technology Officer

Erol Oktay
ITER Science Officer

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High Energy Physics (HEP)

Mission:

- **To understand how the universe works at its most fundamental level, which is done by discovering the elementary constituents of matter and energy, probing the interactions between them, and exploring the basic nature of space and time.**

Research Areas:

Experimental High Energy Physics Research

Theoretical High Energy Physics Research

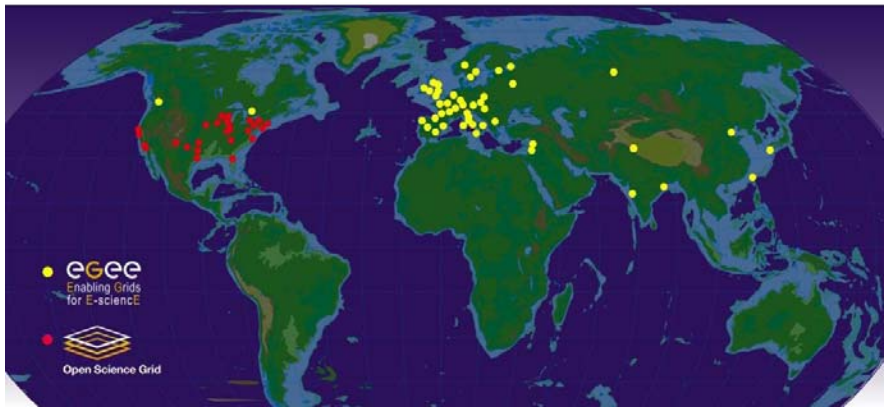
Advanced Technology Research and Development

Director: Dr. Dennis Kovar

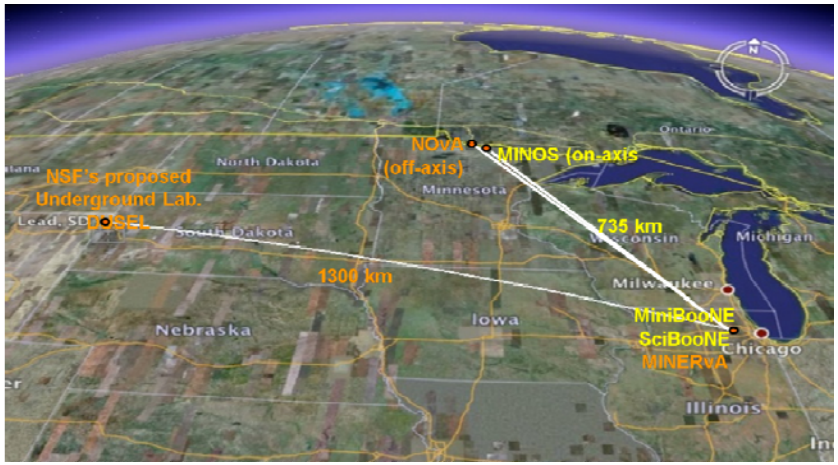
The U.S. High Energy Physics Program

The U.S. is uniquely positioned for a world-leading program in neutrino physics

The U.S. is a critical and strategic partner in global scientific collaborations that push the boundaries of High Energy Physics. The U.S. has developed components for the Large Hadron Collider at CERN (the European Organization for Nuclear Research) and hosts centers for data analysis.



Network sites of the Open Science Grid and Enabling Grids for E-sciencE used for transmitting experimental data from the LHC to scientists worldwide.



The NuMI beamline provides the world's most intense neutrino beam for the MINOS experiment and proposed NOvA and LBNE experiments

At home, HEP builds on its investments in tools and facilities to capture the unique opportunities of neutrino science. These opportunities are fundamental to the science of particle physics.

At the heart of the DOE HEP program is the NuMI (Neutrinos at the Main Injector) beamline at Fermilab, the world's most intense neutrino source, which serves the experiments of MINERvA (Main Injector Neutrino ExpeRiment v-A) and MINOS (Main Injector Neutrino Oscillation Search) and will support NovA (NuMI Off-Axis Electron Neutrino Appearance) and the proposed LBNE (Long-Baseline Neutrino Experiment).

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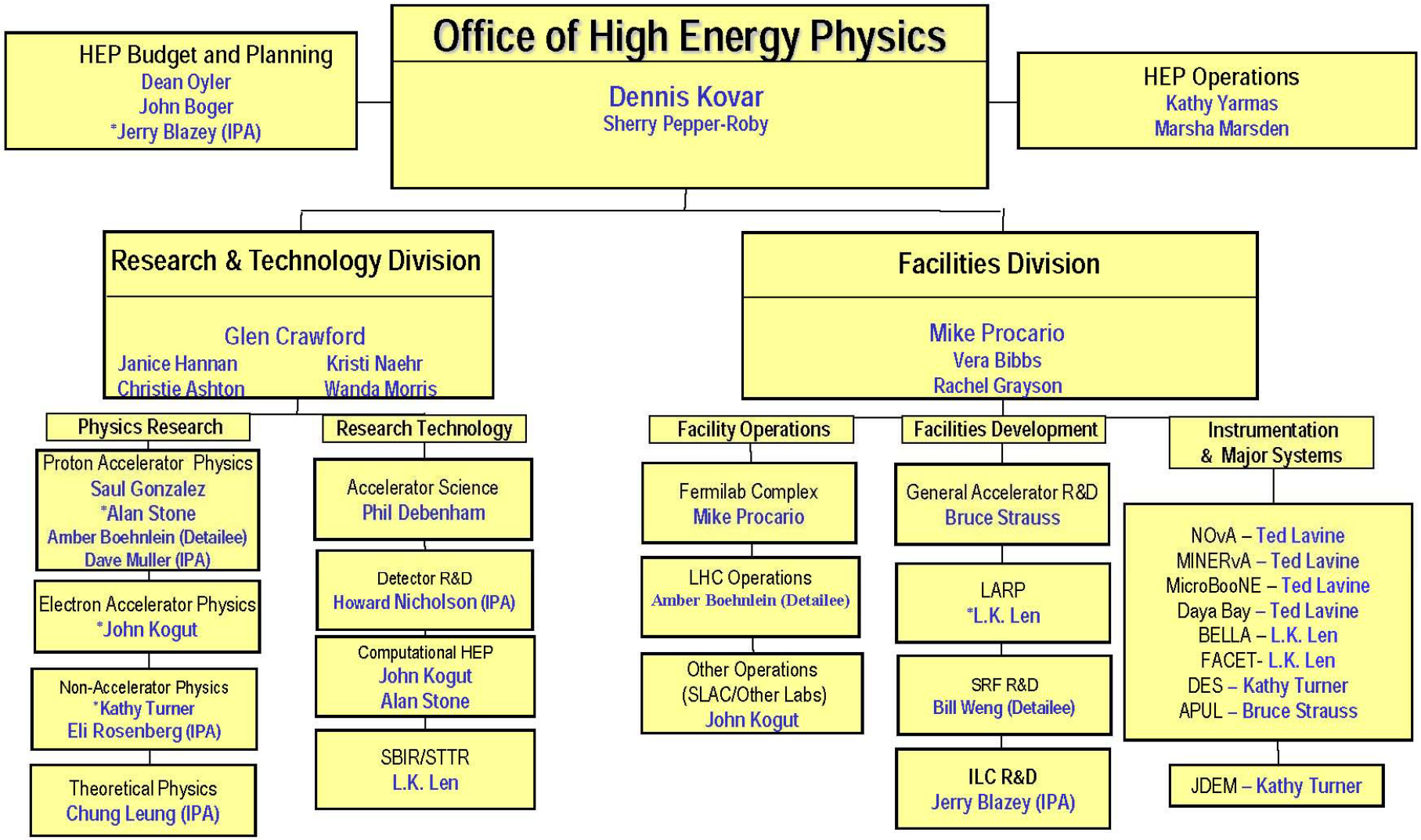
HEP Organization Chart



*Denotes base position

Nuclear Physics (NP)

Mission:

To discover, explore, and understand all forms of nuclear matter. The fundamental particles that compose nuclear matter—quarks and gluons—are relatively well understood, but exactly how they fit together and interact to create different types of matter in the universe is still largely not understood.

To solve this mystery, NP supports experimental and theoretical research—along with the development and operation of particle accelerators and advanced technologies—to create, detect, and describe the different forms and complexities of nuclear matter that can exist in the universe, including those that are no longer found naturally.

Research Areas:

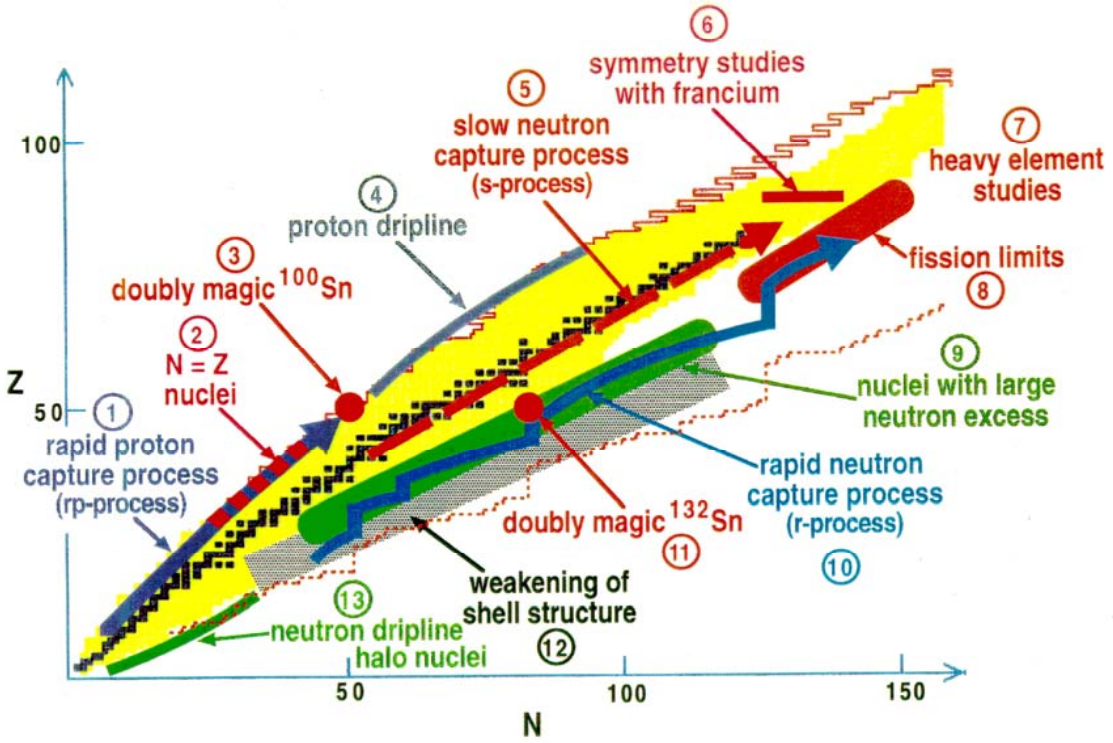
- **Medium Energy Nuclear Physics**
- **Heavy Ion Nuclear Physics**
- **Low Energy Nuclear Physics**
- **Nuclear Theory (including the Nuclear Data subprogram)**
- **Accelerator Research & Development for Current & Future NP Facilities**
- **Isotope Development and Production for Research and Applications**

- **Director: Dr. Timothy Hallman**

The DOE Nuclear Physics Program

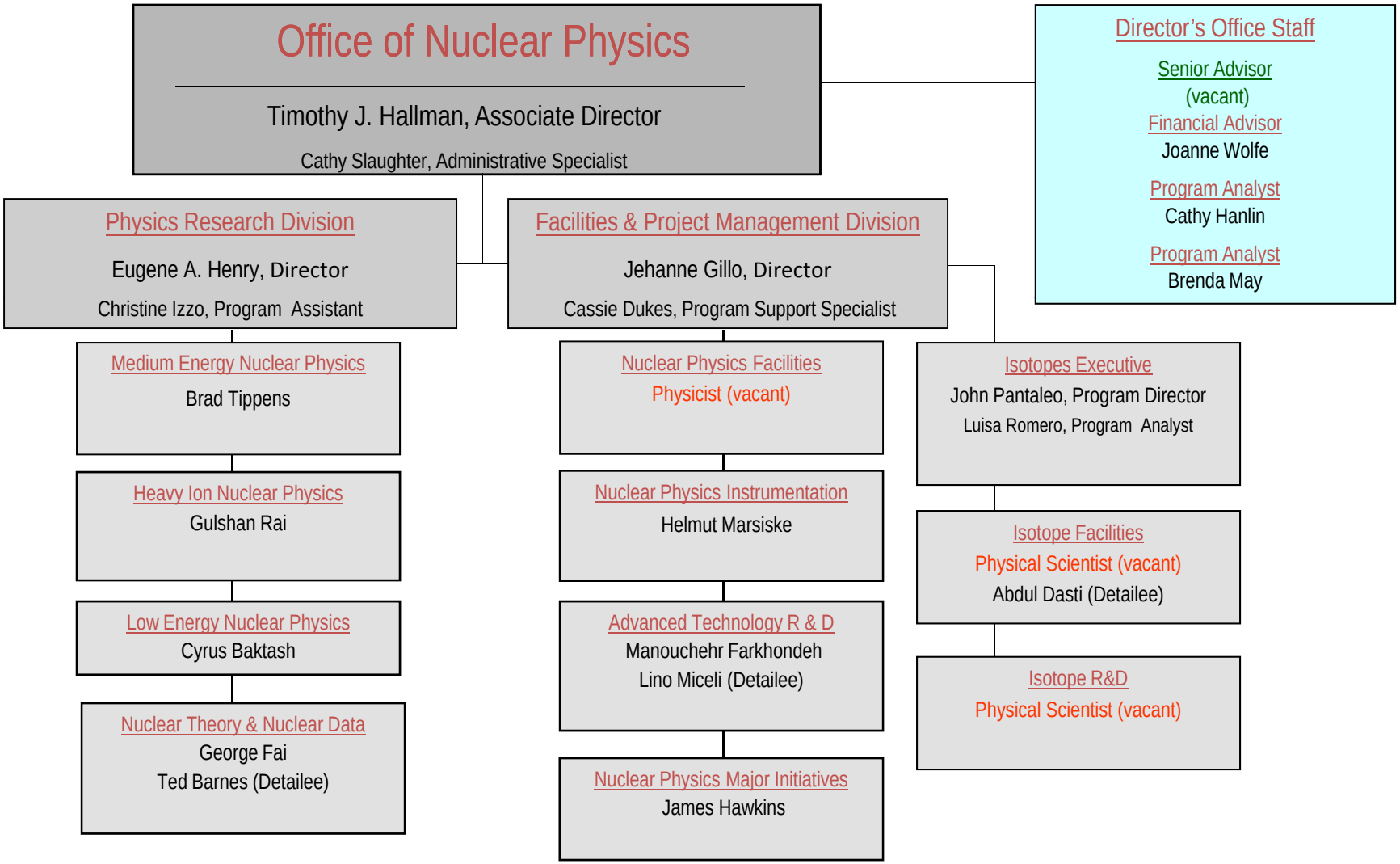
Charting new directions at the frontiers of nuclear science

The U.S. is a leader in studying the compelling questions of nuclear science, advancing our knowledge of the world, and leading to applications in energy research, medicine, national security, and isotopes for a wide variety of purposes.



- **The Relativistic Heavy Ion Collider (RHIC)** is the only machine in the world colliding heavy ions at near light speed.
- **The Continuous Electron Beam Accelerator Facility (CEBAF)** is the world's most powerful probe for studying the nucleus of the atom.
- Investments in **Radioactive Ion Beam** experiments and capabilities (such as the **Facility for Rare Isotope Beams—FRIB**), probe the properties of rare nuclear isotopes to better understand the origin of the elements and fundamental symmetries of nature

Office of Nuclear Physics



Thank You

linda.blevins@science.doe.gov

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