

# Getting Funded Through DOE's Office of Basic Energy Sciences

*American Vacuum Society*  
Nashville TN

October 31, 2011

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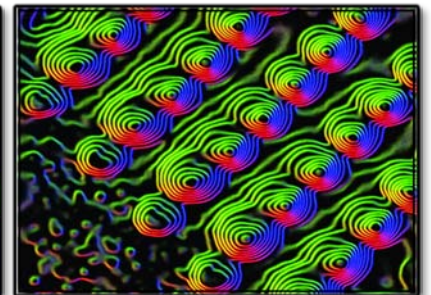
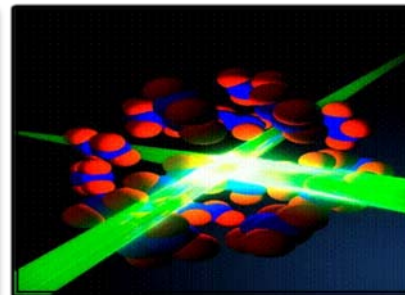
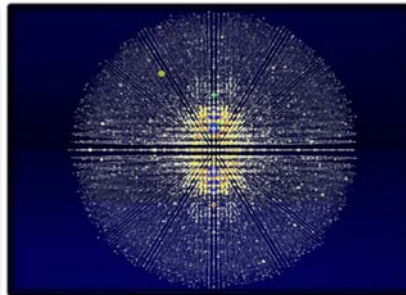
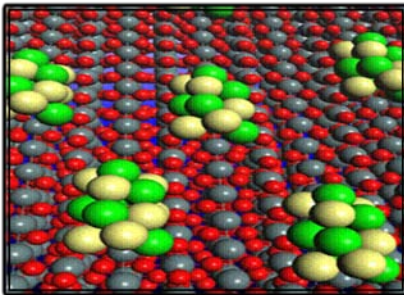
Office of Science  
William Brinkman  
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Basic Energy Sciences Harriet Kung	High Energy Physics James Siegrist
Advanced Scientific Computing Research Dan Hitchcock (A)	Nuclear Physics Tim Hallman
Biological & Environmental Research Sharlene Weatherwax	Fusion Energy Sciences Ed Synakowski
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# Basic Energy Sciences Mission

- Fundamental research to understand, predict, and ultimately control matter and energy at the electronic, atomic, and molecular levels
- Provide the foundations for new energy technologies to support DOE's missions in energy, environment, and national security
- Plan, construct, and operate world-leading scientific user facilities for the Nation



# BRNs: Basic Research Needs Documents

## Disruptive, Transformational Advances Require “Control”

Control of materials properties and functionalities through electronic and atomic design



- New materials discovery, design, development, and fabrication, especially materials that perform well under extreme conditions
- “Control” of photon, electron, spin, phonon, and ion transport in materials
- Science at the nanoscale, especially low-dimensional systems
- Designed catalysts
- Designed interfaces and membranes
- Structure-function relationships
- Bio-materials and bio-interfaces, especially at the nanoscale
- New tools for spatial characterization, temporal characterization, and for theory/modeling/computation

# Office of Basic Energy Sciences

**Office of Basic Energy Sciences**  
Harriet Kung, Director

**Materials Sciences and  
Engineering Division**

Materials Discovery, Design  
and Synthesis

Condensed Matter and  
Materials Physics

Scattering and  
Instrumentation Sciences

**Scientific User Facilities  
Division**

X-Ray and Neutron  
Scattering Facilities

Nanoscience and Electron  
Microscopy Centers

**Chemical Sciences,  
Geosciences and Biosciences  
Division**

Fundamental Interactions

Photochemistry and  
Biochemistry

Chemical Transformations

**Research grouped by scientific topics  
-- not by specific energy technologies**



# FY 2011 BES Budget Appropriation

## Core research

- \$100M for Energy Frontier Research Centers
- Core research largely flat with FY 2010
- EPSCoR funded at \$8.2M per request

## Scientific user facilities operations

Modest increase in operations funding:

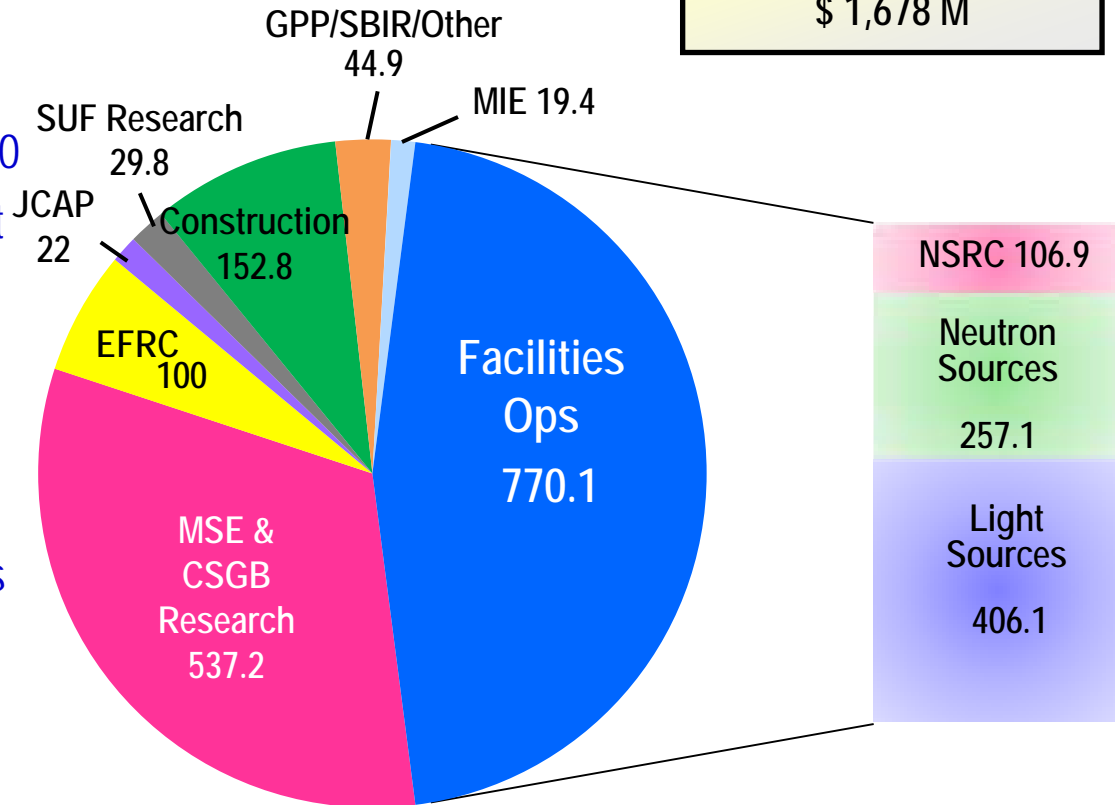
- Synchrotron light sources
- Neutron scattering facilities
- Nanoscale Science Research Centers

## Construction and instrumentation

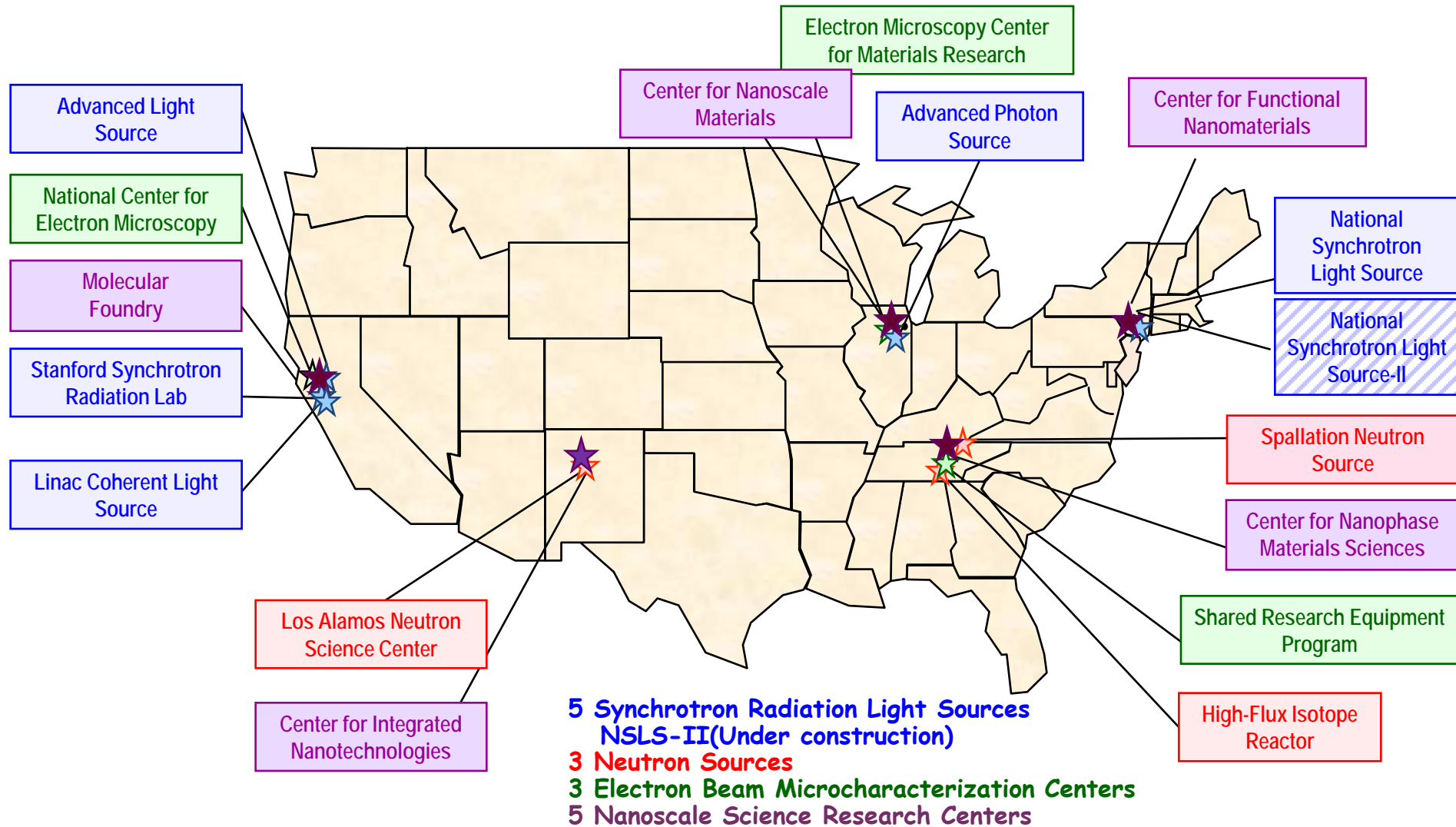
Funding for:

- National Synchrotron Light Source-II
- Spallation Neutron Source instruments
- SNS Power Upgrade

FY 2011 Appropriation  
\$ 1,678 M



# BES Scientific User Facilities: Resources for Research



# Nanoscale Science Research Centers

Dedicated, custom-built user facilities *with* world-class scientific expertise





# Core Research Program

## All peer-reviewed / renewals ~ 3 year cycle

### University Grant Program

- Research emphasis on innovation-driven science in academic environment
- Single PI and multi-PI projects with focused scientific themes
- Limited labor costs (typically one month faculty summer salary, with support for post-doc and students)
- White papers may be submitted prior to submission of new proposals – feedback provided by program managers

### DOE Lab Program

- Interdisciplinary, large research team approach; Projects have multiple PIs
- Support large fraction of investigators' salary, research equipment costs, and other materials
- Aligned with DOE laboratory identified vision, priority, and strengths
- Focus on building and maintaining mission-driven research capabilities, synergistic with other DOE programs
- For new activities, white papers must be submitted through Laboratory Management –full proposals may be encouraged



# BES Research FAQs

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- All research funded at laboratories and universities, including facilities construction and operations, is awarded through a peer-reviewed, merit-based process.
  - About 1/3 of DOE Office of Science research funding goes to support grants at more than 300 colleges and universities nationwide
  - The Small Business Innovative Research (SBIR) Program may be an opportunity for funding for commercial growth of research activities
  - **E**xperimental **P**rogram to **S**timulate **C**ompetitiveness in **R**esearch (EPSCoR) program has special calls for states with low federal research investment
  - BES User Facilities provide resources for research
    - ~10,000 users of BES scientific facilities a year
    - No cost to users, research must be published
    - Time and access are awarded through competitive review
-

# Funding Opportunities: FAQs

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- **How do I get DOE/BES support?**
    - Respond to “Open Call For Proposals” (Special Calls may have different requirements – read these carefully)
    - Hypothesis driven, fundamental science project - energy relevance
    - White papers/pre-proposals are encouraged but not required for academic research
    - All proposals are peer reviewed
  - **How much support can I get?**
    - Peer review will assess requests versus research needs (10 CFR 605)
  - **How long will it take for me to find out if my project is funded?**
    - Open call is a continuous process (no fixed deadline for submission)
    - Reviews take 4 – 6 months to complete, awards are made based on strength of the merit review and available resources
    - Proposals can be held up to one year for consideration
  - **I want to support my research program with multiple federal grants – what are the requirements?**
    - You must have separate research proposals that can “stand alone” with respect to research output
-

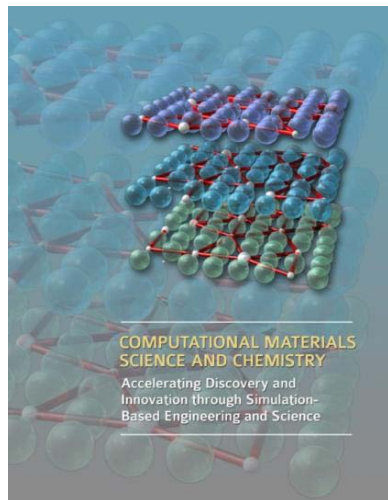
# SciDAC: Scientific Discovery Through Advanced Computing

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- **Scientific Computation Partnership: Materials & Chemical Sciences**
- **Excited State Properties and Processes**
  - energy transport, electron transfer
- **Correlation Effects**
  - beyond DFT, magnetism, superconductivity
- **Requirements**
  - creative, New, Science
  - exploit leadership class machines
  - couple to Institutes
- **Funding (up to) \$6 million, 5-12 Awards**
- **Pre-Apps: December 9**
- **Full Proposals: March 12**
- **[http://science.doe.gov/grants/pdf/SC\\_FOA\\_0000593.pdf](http://science.doe.gov/grants/pdf/SC_FOA_0000593.pdf)**

# Materials by Design – Materials Genome Initiative – American Manufacturing

Joint BES-ASCR  
Workshop, July 2010



National Science and Technology Council,  
Office of Science and Technology Policy



A Renaissance in American Manufacturing,  
President Obama Speech on June 24, 2011



*"We are at the threshold of a new era where predictive modeling will transform our ability to design new materials and chemical processes, thereby enabling rational discovery strategies for systems that were not tractable a few years ago."*

*The Materials Genome Initiative will create a new era of materials innovation that will serve as a foundation for strengthening domestic industries ...and offers a unique opportunity for the United States to discover, develop, manufacture, and deploy advanced materials at least twice as fast as possible today, at a fraction of the cost.*

*President Obama kicks off the **Advanced Manufacturing Partnership (AMP)**, a national collaboration between the government, industries, and universities to invest in cutting-edge technologies, create new jobs and bring about a renaissance in American manufacturing. As part of his new AMP, the President is announcing an ambitious plan, the **Materials Genome Initiative**, to double the speed with which we discover, develop, and manufacture new materials.*

# More Information? <http://science.energy.gov/bes/> \*

The screenshot shows the BES website with several red annotations:

- A red arrow points to the "GO" button in the search bar.
- A red circle highlights the "Benefits of BES" link in the left sidebar.
- Two red arrows point to the "Energy Innovation Hubs" and "Energy Frontier Research Centers (EFRCs)" links in the "What's New" section.
- A red circle highlights the "Materials Sciences and Engineering Division" link in the list of divisions.

U.S. DEPARTMENT OF ENERGY Office of Science

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You are here: SC Home » Programs » BES Home

## Basic Energy Sciences (BES)

Home

BES Home

About BES

BES Research

BES Facilities

**Benefits of BES**

BES Funding Opportunities

Basic Energy Sciences Advisory Committee (BESAC)

BES News & Resources

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### Science for Energy

Discovery science solves mysteries, sparks innovation, and stimulates future technologies. This principle provides the inspiration for the fundamental energy research and the remarkable collection of major scientific user facilities supported by Basic Energy Sciences.

[Read More »](#)

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## Basic Energy Sciences

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Basic Energy Sciences (BES) supports 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. The BES program also plans, constructs, and operates major scientific user facilities to serve researchers from universities, national laboratories, and private institutions. The BES program funds work at more than 160 research institutions through the following three Divisions:

- Materials Sciences and Engineering Division**
- Chemical Sciences, Geosciences, and Biosciences Division

### What's New

- Energy Innovation Hubs
- Energy Frontier Research Centers (EFRCs)
- FY 2012 Budget
- Budget Summary (79KB)