2016 Department of Energy
Project Management Workshop
*"Enhancing Project Management"*

# Office of Science Projects Perspective

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Director
Office of Project Assessment

# The Science Mission

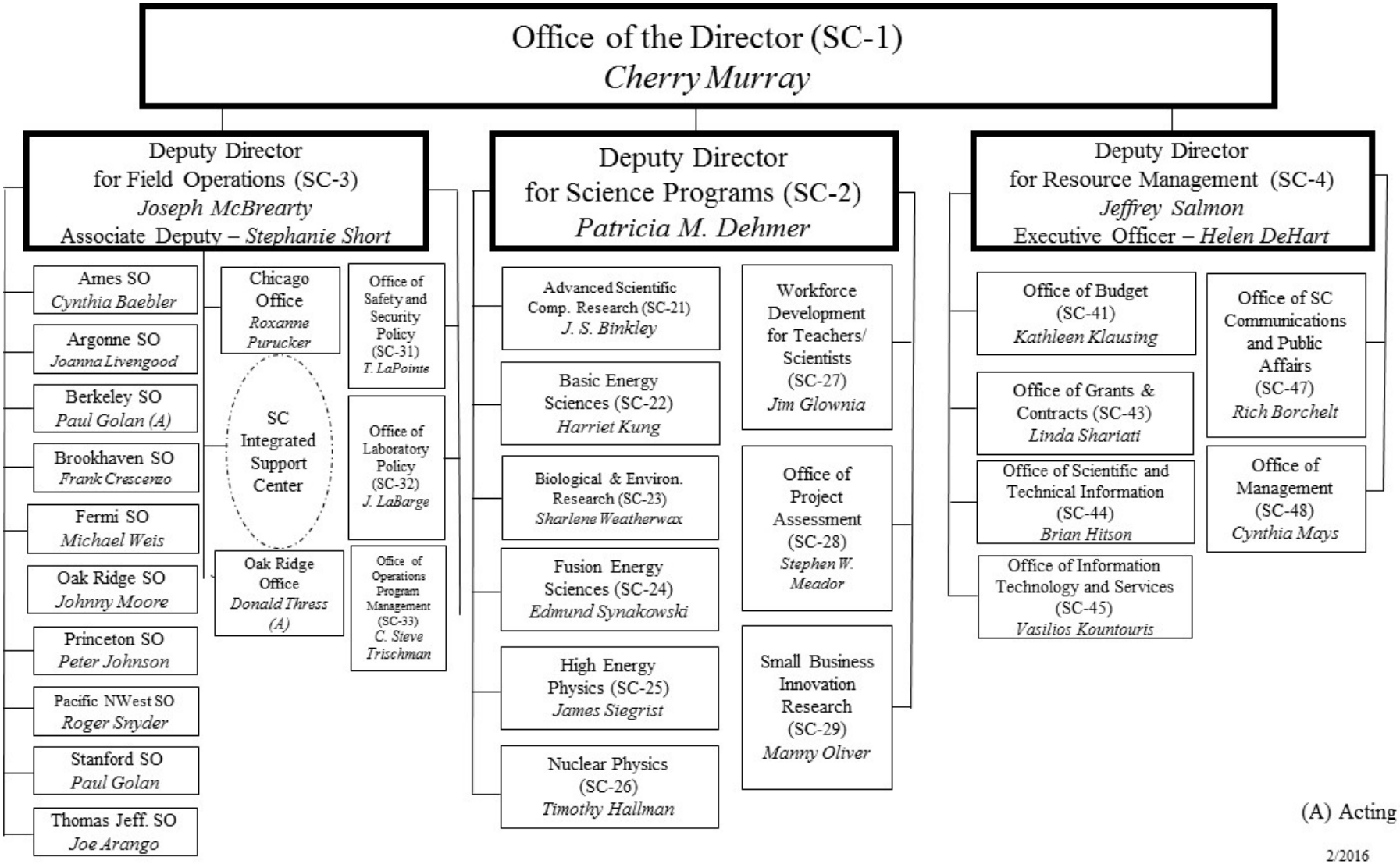
SC delivers scientific discoveries and tools to transform our understanding of nature and advance the energy, economic, and national security of the U.S.

Science Serving the Nation

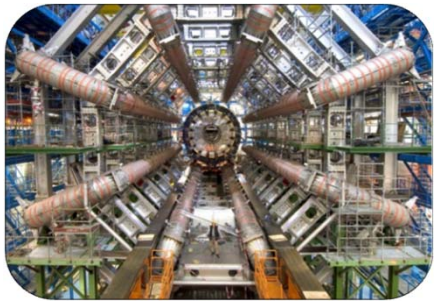
**Office of Science**

U.S. DEPARTMENT OF ENERGY | Office of Science

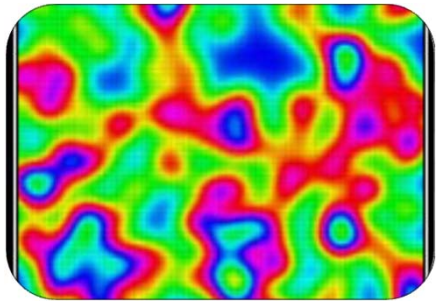
# SC Organization



# Office of Science FY17 Request: $5.67B

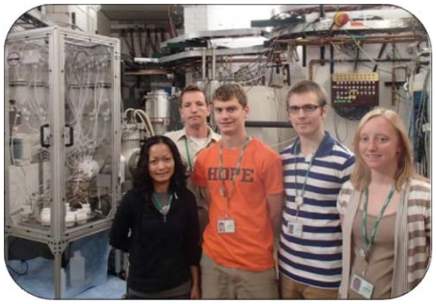


Largest Supporter of Physical Sciences in the U.S.



Research: 42%, $2.4B

~40% of Research to Universities



> 20,000 Scientists Supported

Funding at >300 Institutions including all 17 DOE Labs

Facility Operations: 36%, $2.06B

>30,000 Scientific Facility Users

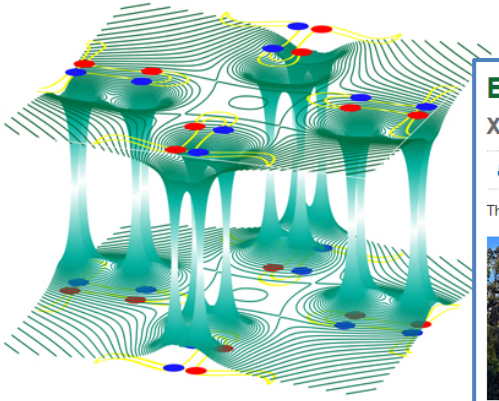
$1.8B Mission Innovation

# Results: http://science.energy.gov/

## Down the Rabbit Hole: How Electrons Travel Through Exotic New Material

Researchers at Princeton University have observed a bizarre behavior in a strange new crystal that could hold the key for future electronic technologies.

Read More



### Featured Articles

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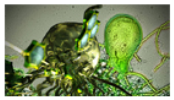
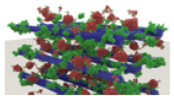


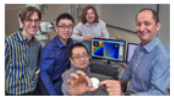
**Biofuel Tech Straight from the Farm**

Research team taps EMSL and DOE JGI to harness promising fungi found in manure. Read More



**Titan Probes Depths of Biofuel's Biggest Barrier**

ORNL researchers' 23.7-million atom system demonstrates why lignin is such a problem. Read More



**Scientists Guide Gold Nanoparticles to Form "Diamond" Superlattices**

DNA scaffolds cage and coax nanoparticles into position to form crystalline arrangements that mimic the atomic structure of diamond. Read More

### Science Headlines

**Brookhaven Lab Facilities Offer Beamline for Cutting Science**

**03.15.16** The Coherent Soft X-ray S Spectroscopy (CSX-2) beamline at Synchrotron Light Source II, which users in February, was built in part Center for Functional Nanomateria

Read More

**Hunting For Big Bang Neu Could Provide Fresh Insig Origin of the Universe**

**03.14.16** Researchers at Princeton Physics Laboratory are readying a detect Big Bang neutrinos by capt postage stamp-sized sheet of grap 1/100th of a milligram of tritium.

Read More

**New Fuel Cell Design Pow Graphene-Wrapped Nanoc**

**03.14.16** Researchers at the U.S. Energy's Lawrence Berkeley Natio (Berkeley Lab) have developed a new materials recipe for a battery-like hydrogen fuel cell—which surrounds hydrogen-absorbing magnesium

### University Research

RSS | View All »

**Riedo Leads Novel Study on Designing Reconfigurable Magnetic Nanopatterns**

A team of international

**Study Offers Clearest Picture Yet of How HIV Defeats a Cellular Defender**

University of Illinois physics

**Arctic Tundra**

Neil Sturchio, professor and chair of the University of Delaware's Department of

## BES User Facilities

### X-Ray Light Sources

Print | Text Size: A A A | Feedback [+] | Share

The Basic Energy Sciences program supports the following X-Ray Light Source national scientific user facilities:

**Advanced Light Source (ALS)**

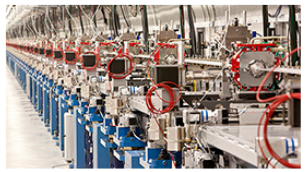
at Lawrence Berkeley National Laboratory

The ALS is one of the world's brightest sources of high-quality, reliable vacuum-ultraviolet light and soft X-rays, enabling a wide variety of scientific disciplines.

**Advanced Photon Source (APS)**

at Argonne National Laboratory

The APS is one of only four third-generation, hard x-ray synchrotron radiation light sources in the world, which has brought about new discoveries in a wide range of scientific fields.



**Linac Coherent Light Source (LCLS)**

at SLAC National Accelerator Laboratory

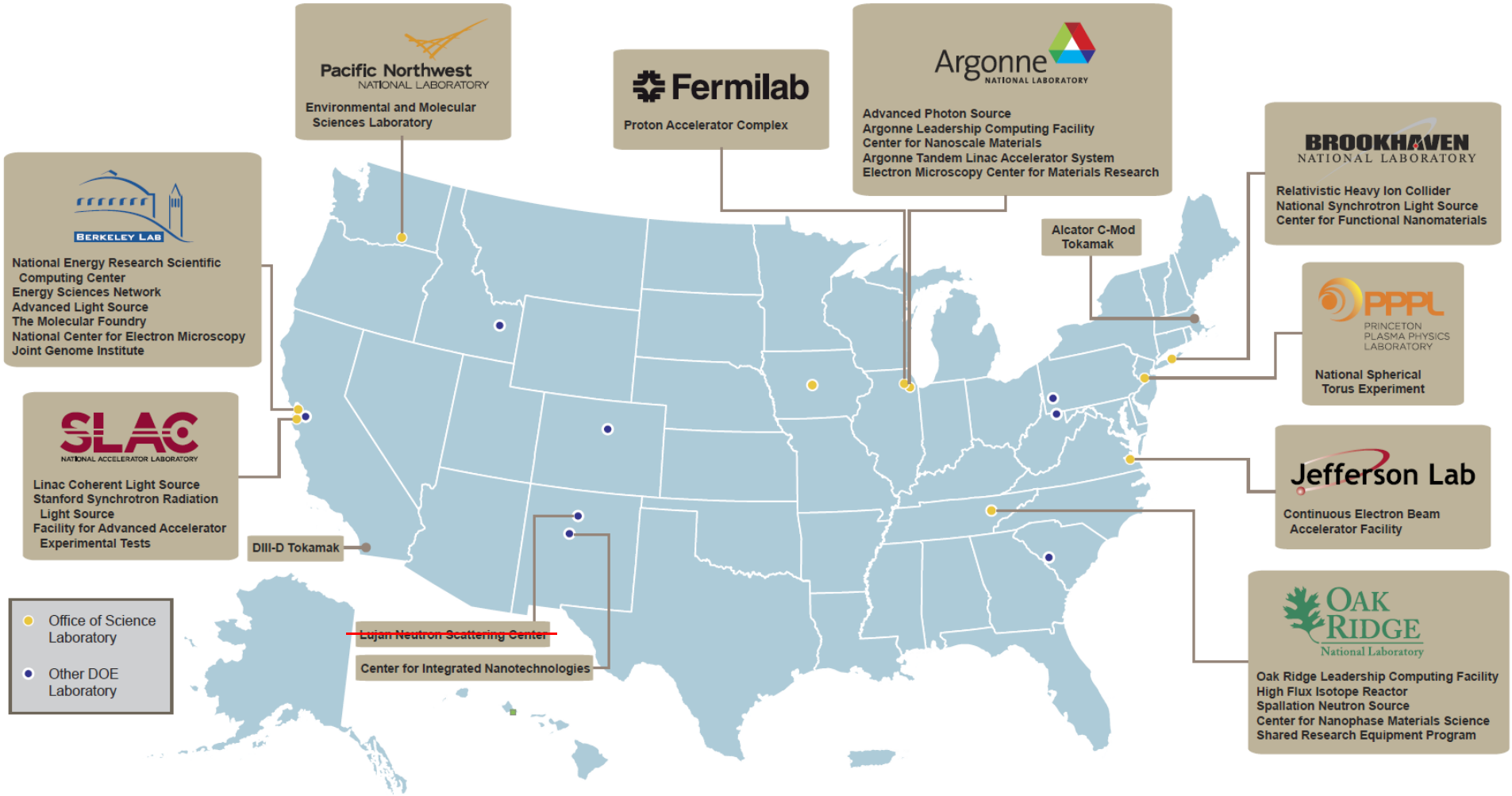
The LCLS is the world's first hard x-ray free electron laser facility capable of producing x-rays that are both very intense and clumped into ultrafast pulses.

**National Synchrotron Light Source II (NSLS-II)**

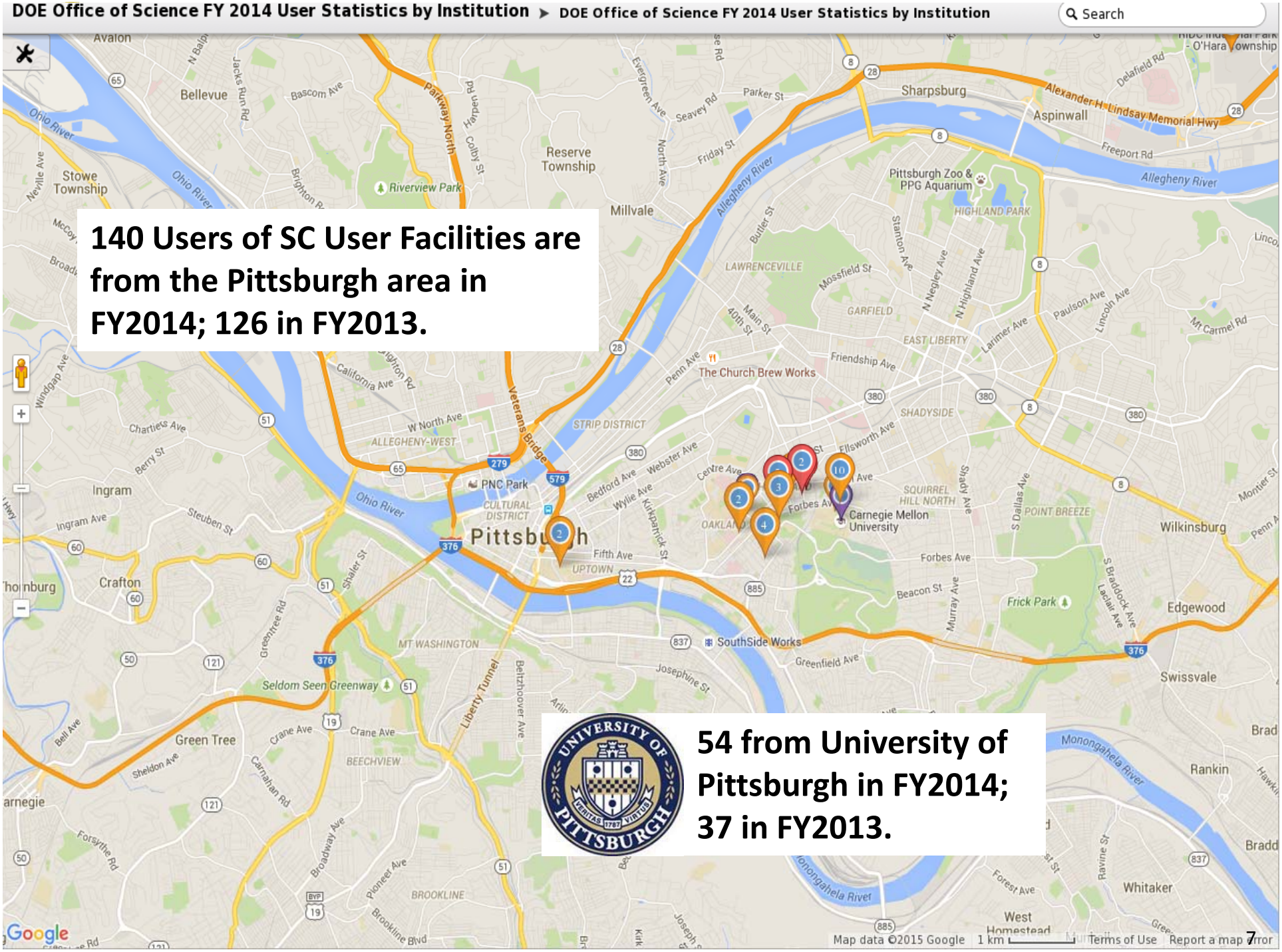
at Brookhaven National Laboratory

The NSLS-II is a state-of-the-art synchrotron light source which allows for scientists to probe the fundamental properties of matter, paving the way to new scientific discoveries and innovations.

# SC User Facilities and the DOE Laboratories




Map reflects FY 2012 status. See http://science.energy.gov/user-facilities/ for more information.


DOE Office of Science FY 2014 User Statistics by Institution
DOE Office of Science FY 2014 User Statistics by Institution
Search
140 Users of SC User Facilities are from the Pittsburgh area in FY2014; 126 in FY2013.
54 from University of Pittsburgh in FY2014; 37 in FY2013.
Pittsburgh
Carnegie Mellon University
Pittsburgh Zoo & PPG Aquarium
PNC Park
Ohio River
Allegheny River
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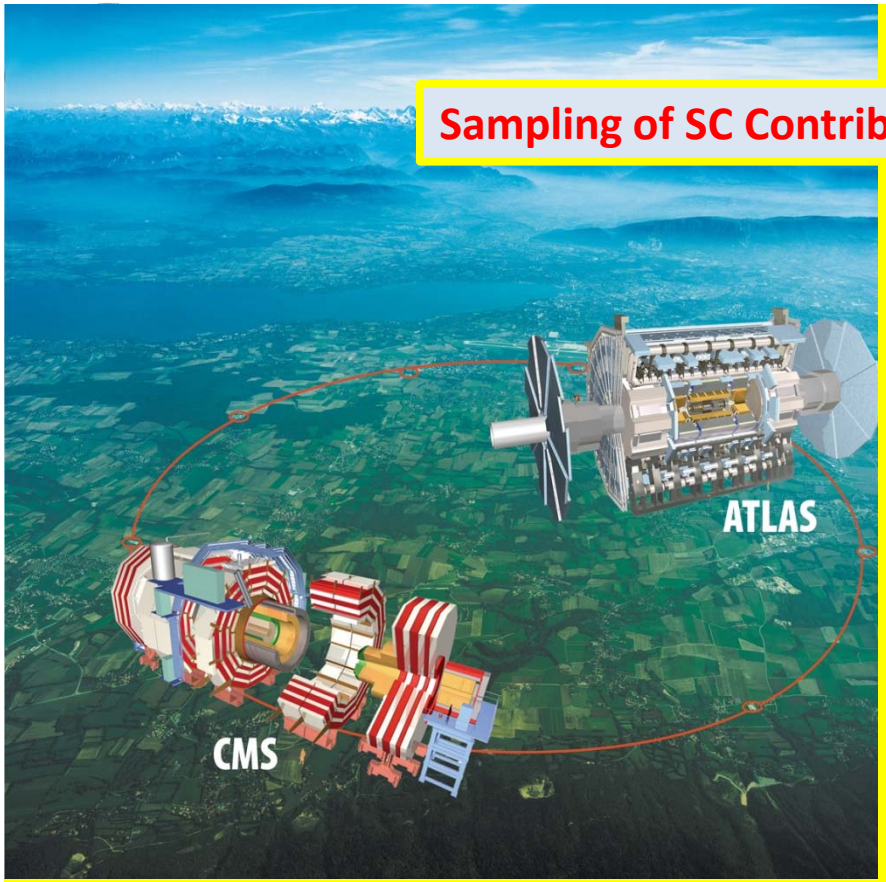
# Sampling of SC Contributions to Non-DOE Facilities



# SC Project Portfolio Update

## FY2016

26 Active projects with TPC > $10M

- Performance
  - 12 projects are assessed as **Green**
  - 1 project is assessed as **Yellow**
- Phase
  - 13 projects are post CD-2
  - 13 projects are pre-CD-2
- Scale
  - 7 projects have a TPC of $100M or greater
  - 19 projects have a TPC less than $100M

## FY2017

28 Active projects with TPC > $10M

- Performance
  - 12 projects are assessed as **Green**
  - 1 project is assessed as **Yellow**
- Phase
  - 12 projects are post CD-2
  - 16 projects are pre-CD-2
- Scale
  - 8 projects have a TPC of $100M or greater
  - 20 projects have a TPC less than $100M

# SC Projects are Hard

High Energies

Extreme Temperatures

Strong Magnetic Fields

Exotic Materials

Demanding Tolerances

High Reliability Requirements

Mass Production, Assembly, Testing

Massive Data Acquisition

In Space, Chilean High Desert, Mile Deep

Superconducting Magnets

Cryogenics

International Collaborations

# SC PM Culture

Projects are typically '*build to cost*' with a goal of maximizing science capability

Project designs consider *potential enhancements and future upgrades*—programs and projects take a long view

*Facility users* (and science community) are engaged throughout the project lifecycle

*Project advisory committees* (technical, ESH, management) are thoughtfully appointed and valued

*SC peer reviews* are regular, recognized by the science community, and facilitate sharing of lessons learned

SC expectation that *PM systems be rigorous* and performance be *continually improved*

# Ongoing PM Enhancements

- Organizational
  - PMSOs, CPOs, PMOGs
- Processes and Tools
  - Risk Workshops, EVMS, BIM, Cost Estimating, Design Plans, Assumptions Documents, Integration
- Lessons Learned
  - Pre-project planning seminars/workshops, benchmarking