



U.S. DEPARTMENT OF
ENERGY

Office of
Science

DOE Office of Science

Update and FY 2018 Budget Request to Congress

Presented to the

Nuclear Sciences Advisory Committee

by

Steve Binkley

Deputy Director for Programs

Steve.Binkley@science.doe.gov

June 2, 2017

Outline

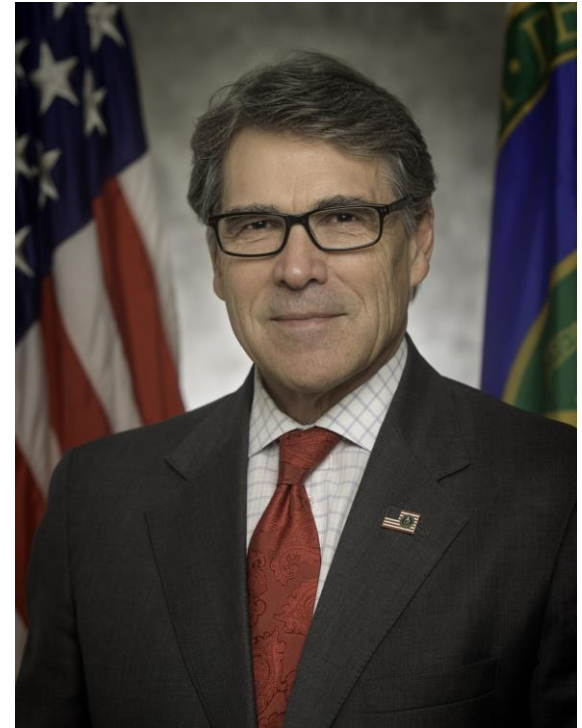
- Appointee status
- Personnel changes
- FY 2018 Budget



Appointee Status

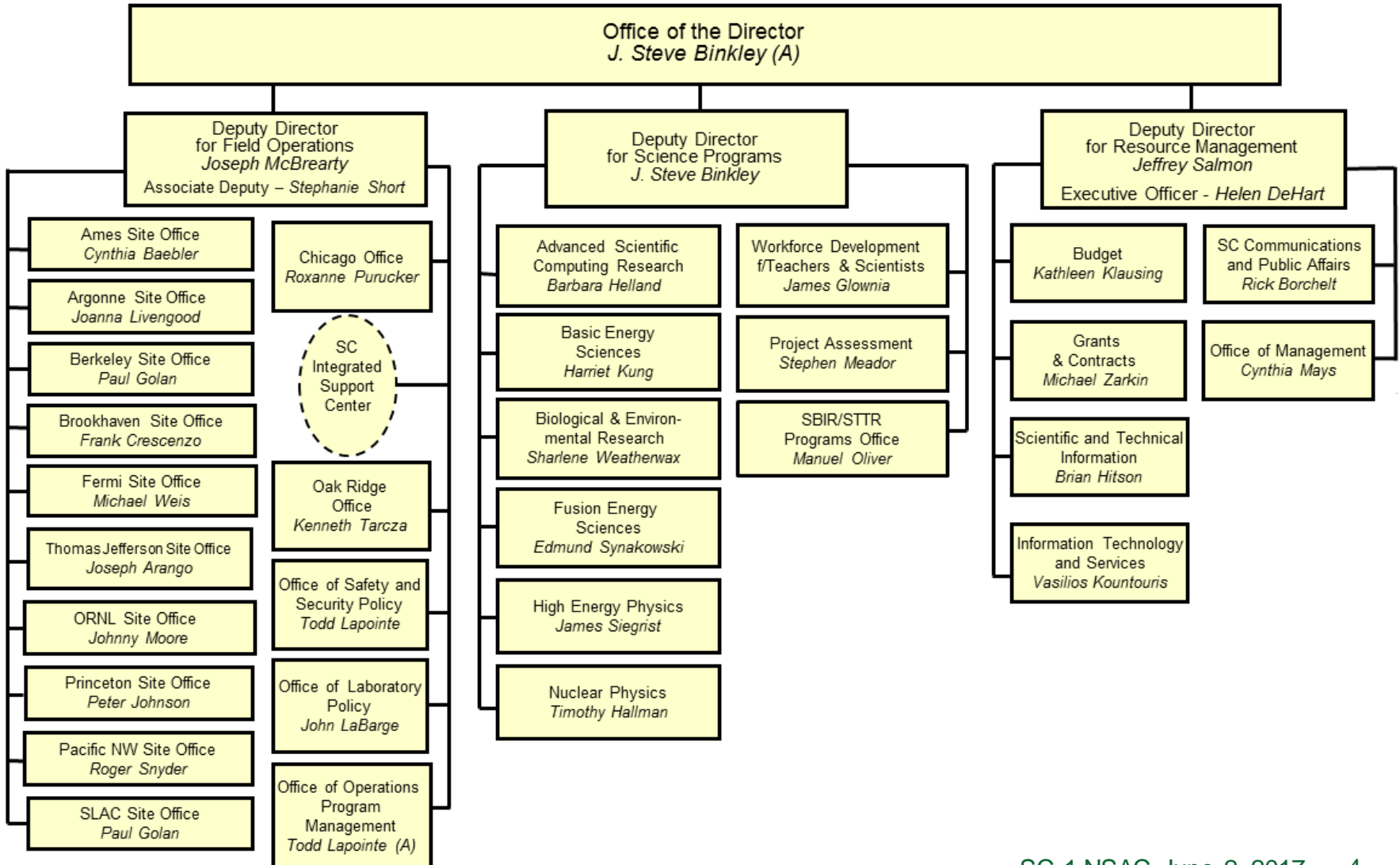
Secretary of Energy Rick Perry

- Nomination announced December 14, 2016
- Confirmed by Senate March 2, 2017



Deputy Secretary of Energy Nominee Dan Brouillette

- Nomination announced April 3, 2017
- Senate Hearing May 25, 2017



Office of Science

By the numbers

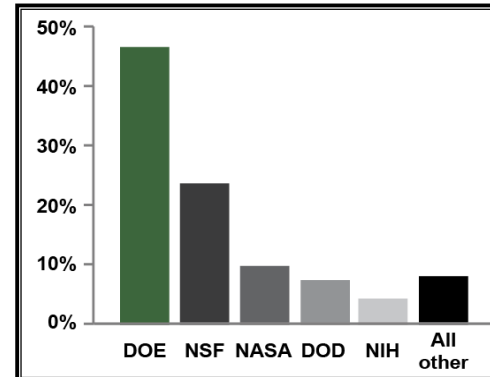


Shown is a portion of SLAC's two-mile-long linear accelerator (or linac), which provides the electron beam for the new Linac Coherent Light Source (LCLS) – the world's first hard x-ray, free-electron laser. For nearly 50 years, SLAC's linac had produced high-energy electrons for physics experiments. Now researchers use the very intense X-ray pulses (more than a billion times brighter than the most powerful existing sources) much like a high-speed camera to take stop-motion pictures of atoms and molecules in motion, examining fundamental processes on femtosecond timescales.

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

Research

- Provides about half of the U.S. Federal support for basic research in the physical sciences;
- Supports about 19,000 Ph.D. scientists, graduate students, engineers, and support staff at over 300 institutions and 10 DOE national laboratories;
- Maintains U.S. and world leadership in high-performance computing and computational sciences;
- Continues to be the major U.S. supporter of physics, chemistry, materials sciences, and biology for discovery and for energy sciences.



Support for basic research in the physical sciences by agency.

Source: *NSF Science and Engineering Indicators 2012*

Scientific User Facilities

- SC maintains the world's largest collection of scientific user facilities (aka research infrastructure) operated by a single organization in the world, used by more than 27,000 researchers each year.

Office of Science FY 2018 President's Request

(Dollars in thousands)

	FY 2016 Enacted	FY 2016 Current w/SBIR-STTR ^a	FY 2017 Annualized CR ^b	FY 2017 Enacted	FY 2018 President's Request	FY 2018 Request vs. FY 2016 Current w/SBIR-STTR ^a	FY 2018 Request vs. FY 2017 Enacted
Science							
Advanced Scientific Computing Research	621,000	621,000	619,819	647,000	722,010	+101,010	+16.3%
Basic Energy Sciences	1,849,000	1,849,000	1,845,485	1,871,500	1,554,500	-294,500	-15.9%
Biological and Environmental Research	609,000	609,000	607,842	612,000	348,950	-260,050	-42.7%
Fusion Energy Sciences	438,000	438,000	437,167	380,000	309,940	-128,060	-29.2%
High Energy Physics	795,000	795,000	793,489	825,000	672,700	-122,300	-15.4%
Nuclear Physics	617,100	617,100	615,927	622,000	502,700	-114,400	-18.5%
Workforce Development for Teachers and Scientists	19,500	19,500	19,463	19,500	14,000	-5,500	-28.2%
Science Laboratories Infrastructure	113,600	113,600	113,384	130,000	76,200	-37,400	-32.9%
Safeguards and Security	103,000	103,000	102,805	103,000	103,000	...	...
Program Direction	185,000	185,000	184,648	182,000	168,516	-16,484	-8.9%
Subtotal, Science	5,350,200	5,350,200	5,340,029	5,392,000	4,472,516	-877,684	-16.4%
Rescission of Prior Year Balances	-3,200	-3,200	-3,194	-239	...	+3,200	-100.0%
Total, Science Appropriation	5,347,000	5,347,000	5,336,835	5,391,761	4,472,516	-874,484	-16.4%

^a The FY 2016 Enacted column printed in the FY 2018 Congressional Budget Justification (President's Request) includes SBIR/STTR funding in the program lines and reflects programmatic updates through the end of the fiscal year.

^b This column provides the Annualized CR amount (CR through April 28, 2017; P.L. 114-254). It is calculated by reducing the FY 2016 Enacted by 0.1901%



Priorities for FY 2018

- **Focus on cutting edge, early stage research and development; achieve 40% funding for research**
 - The Office of Science (SC) is the largest Federal supporter of basic research in the physical sciences in the United States. SC supports research at the frontiers of science—discovering nature’s mysteries, from the study of subatomic particles, atoms, and molecules that are the building blocks of the materials of our everyday world, to the DNA, proteins, and cells that are the building blocks of entire biological systems.
 - SC also supports science for energy—advancing a clean energy agenda through fundamental research on energy production, conversion, storage, transmission, and use, and through advancing our understanding of the earth.
- **Continue operations of the national laboratories**
 - SC oversees the operation of ten DOE national laboratories. SC conducts a formal laboratory strategic planning process annually with its labs to understand future directions, immediate and long-range challenges, and resource needs. SC also conducts an annual evaluation of the scientific, technological, managerial, and operational performance of the management and operating contractors of its laboratories. In addition, SC funds mission-ready infrastructure and investments that foster safe and environmentally responsible operations at the labs.
- **Increase funding for Exascale Computing**
- **Maintain all on-going projects and start two new construction projects**
 - 2 New Construction Projects:
 - Advanced Photon Source Upgrade (APS-U) at Argonne National Laboratory (ANL) in Basic Energy Sciences and
 - Energy Sciences Capability at Pacific Northwest National Laboratory (PNNL) in Science Laboratories Infrastructure.



FY 2018 Construction Projects

(dollars in millions)

FY 2016 Current w/ SBIR/STTR	FY 2017 Enacted	FY 2018 President's Request
------------------------------------	--------------------	-----------------------------------

Ongoing Projects:

BES - 13-SC-10 Linac Coherent Light Source II (LCLS-II), SLAC	200.3	190.0	182.1
FES - 14-SC-60 U.S. Contributions to International Thermonuclear Experimental Research (ITER)	115.0	50.0	63.0
HEP - 11-SC-40 Long Baseline Neutrino Facility/Deep Underground Neutrino Experiment (LBNF/DUNE)	26.0	50.0	54.9
HEP - 11-SC-41 Muon to Electron Conversion Experiment (Mu2e)	40.1	43.5	44.4
NP - 14-SC-50 Facility for Rare Isotope Beams (FRIB), Michigan State University	100.0	100.0	80.0
SLI - 15-SC-76 Materials Design Laboratory at ANL	23.9	19.6	24.5
SLI - 15-SC-78 Integrative Genomics Building at LBNL	20.0	19.6	24.8
SLI - 17-SC-71 Integrated Engineering Research Center at FNAL	...	2.5	1.5
SLI - 17-SC-73 Core Facility Revitalization at BNL	...	1.8	1.5
Total, Ongoing Projects	525.3	477.0	476.7

New Starts in FY 2018:

BES - 18-SC-10 Advanced Proton Source (APS) Upgrade, ANL*	...	...	20.0
SLI - 18-SC-71 Energy Sciences Capability, PNNL	...	...	1.0
Total, New Starts in FY 2018	...	...	21.0
Total, Construction	525.3	477.0	497.7

*converts from MIE to Line-Item Construction



FY 2018 MIE Projects

(dollars in millions)

FY 2016 Current w/ SBIR/STTR	FY 2017 Enacted	FY 2018 President's Request
------------------------------------	--------------------	-----------------------------------

Ongoing Projects:

BES - Advanced Photon Source Upgrade (APS-U), ANL*	20.0	42.5	...
HEP - Large Synoptic Survey Telescope camera (LSSTcam)	40.8	45.0	9.8
HEP - Dark Energy Spectroscopic Instrument (DESI)	9.8	12.0	1.9
HEP - Facility for Advanced Accelerator Experimental Tests (FACET-II)	...	0.5	2.0
HEP - Large Underground Xenon (LUX) - ZonEd Proportional scintillation in Liquid Noble gases (ZEPLIN) experiment (LZ)	10.5	12.5	14.1
HEP - Super Cryogenic Dark Matter Search at Sudbury Neutrino Observatory Laboratory (SuperCDMS-SNOLab)	2.4	3.4	2.0
NP - Gamma-Ray Energy Tracking Array (GRETA)	...	0.7	0.2
NP - Stable Isotope Production Facility (SIPF)	...	2.5	1.5
Total, Ongoing Projects	83.5	119.1	31.5

New Starts in FY 2018:

HEP - High Luminosity Large Hadron Collider Accelerator Upgrade Project (HL-LHC AUP)	...	...	27.0
Total, MIEs	83.5	119.1	58.5

*converts from MIE to Line-Item Construction

Questions?

