



U.S. DEPARTMENT OF  
**ENERGY**

Office of  
Science

# FY 2016 Budget Request to Congress for DOE's Office of Science

3 April 2015

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Acting Director, Office of Science

<http://science.energy.gov/sc-2/presentations-and-testimony/>

# Office of Science

## By the numbers

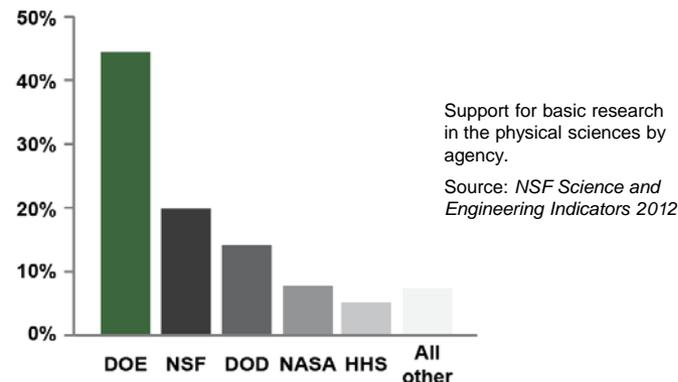


Shown is a portion of SLAC's two-mile-long linear accelerator (or linac), which provides the electron beam for the new Linac Coherent Light Source (LCLS) – the world's first hard x-ray, free-electron laser. For nearly 50 years, SLAC's linac had produced high-energy electrons for physics experiments. 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

- Support for 47% of the U.S. Federal support of basic research in the physical sciences;
- ~22,000 Ph.D. scientists, grad students, engineers, and support staff at >300 institutions, including all 17 DOE labs;
- U.S. and world leadership in high-performance computing and computational sciences;
- Major U.S. supporter of physics, chemistry, materials sciences, and biology for discovery and for energy sciences.



### Scientific User Facilities

- The world's largest collection of scientific user facilities (aka research infrastructure) operated by a single organization in the world, used by 31,000 researchers each year.



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# Office of Science FY 2016 Budget Request to Congress

(Dollars in thousands)

	FY 2014 Enacted Approp. (prior to SBIR/STTR)	FY 2014 Current Approp.	FY 2015 Enacted Approp.	FY 2016 President's Request	FY 2016 President's Request vs. FY 2015 Enacted Appropriation	
Advanced Scientific Computing Research	478,093	463,472	541,000	620,994	+79,994	+14.8%
Basic Energy Sciences	1,711,929	1,662,702	1,733,200	1,849,300	+116,100	+6.7%
Biological and Environmental Research	609,696	593,610	592,000	612,400	+20,400	+3.4%
Fusion Energy Sciences	504,677	495,855	467,500	420,000	-47,500	-10.2%
High Energy Physics	796,521	774,920	766,000	788,000	+22,000	+2.9%
Nuclear Physics	569,138	554,802	595,500	624,600	+29,100	+4.9%
Workforce Development for Teachers and Scientists	26,500	26,500	19,500	20,500	+1,000	+5.1%
Science Laboratories Infrastructure	97,818	97,818	79,600	113,600	+34,000	+42.7%
Safeguards and Security	87,000	87,000	93,000	103,000	+10,000	+10.8%
Program Direction	185,000	185,000	183,700	187,400	+3,700	+2.0%
SBIR/STTR (SC)	.....	128,539	.....	.....	.....	.....
<b>Subtotal, Office of Science</b>	<b>5,066,372</b>	<b>5,070,218</b>	<b>5,071,000</b>	<b>5,339,794</b>	<b>+268,794</b>	<b>+5.3%</b>
SBIR/STTR (DOE)	.....	64,666	.....	.....	.....	.....
<b>Subtotal, Office of Science</b>	<b>5,066,372</b>	<b>5,134,884</b>	<b>5,071,000</b>	<b>5,339,794</b>	<b>+268,794</b>	<b>+5.3%</b>
Use of Prior Year Balances (SBIR)	.....	-3,846	.....	.....	.....	.....
Rescission of Prior Year Balances	.....	.....	-3,262	.....	+3,262	-100.0%
<b>Total, Office of Science</b>	<b>5,066,372</b>	<b>5,131,038</b>	<b>5,067,738</b>	<b>5,339,794</b>	<b>+272,056</b>	<b>+5.4%</b>



# FY 2016 SC Budget Request by Category

Dollars in Thousands

## Construction

- BES: Linac Coherent Light Source-II continues and is in its peak funding year (\$200,300K).
- FES: ITER – support for the USIPO, IO, and hardware fabrication continues (\$150,000K).
- HEP: Long Baseline Neutrino Facility (\$20,000K for PED); Muon to Electron Conversion (\$40,100K).
- NP: FRIB continues and is at the peak of its funding profile (\$100,000K); accelerator commissioning and detector construction of the CEBAF 12 GeV upgrade continue (\$12,000K).
- SLI: Materials Design Lab at ANL (\$23,910K); Photon Science Lab Building at SLAC (\$25,000K); Integrative Genomics Building at LBNL (\$20,000K).
- Also in SLI: “Infrastructure Support” increases by \$31,100K for top priorities identified as part of the Campus Strategy discussions, for electrical upgrades at ANL and SLAC and for facility improvements at FNAL.

## Facility Operations

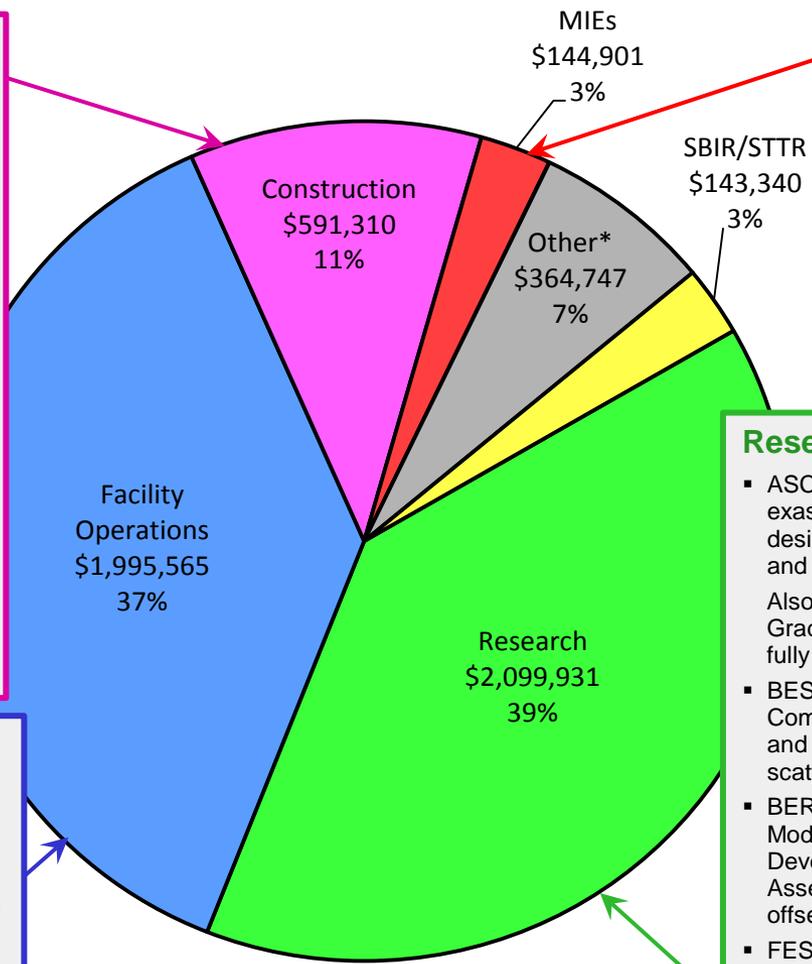
- ASCR, BER, BES, HEP: Facilities operate at or near to optimal, >98%.
- FES: NSTX resumes operations for 14 weeks; DIII-D operates for 12 weeks until shutdown for installation of upgrades; Alcator C-Mod operates for 5 weeks prior to final shutdown at the end of FY 2016.
- NP: RHIC operates 22 weeks, same as in FY 2015 and has funding for capital equipment and spares; ATLAS operates 37 weeks; CEBAF is supported for continued machine development and commissioning of beam to Halls B and C.

## Major Items of Equipment

- BES: Advanced Photon Source Upgrade (APS-U) (\$20,000K) and NSLS-II Experimental Tools (NEXT) (15,500K).
- HEP: LHC Detector Upgrades (ATLAS and CMS) (\$9,500K each); Large Synoptic Survey Telescope camera (LSSTcam) (\$40,800K); Muon g-2 (\$10,200K); LUX-ZEPLIN (\$9,000K); SuperCDMS-SNOlab (\$2,000K); Dark Energy Spectroscopic Instrument (DESI) (\$5,300K).

## Research

- ASCR: There is a significant increase for the exascale initiative to support for HPC vendors to design and develop exascale node technologies and systems. ( $\Delta = +\$86,895K$ ).  
Also in ASCR: The Computational Science Graduate Fellowship is restored at \$10,000K to fully fund a new cohort!
- BES: Increases for EFRCS ( $\Delta = +\$10,000K$ ), Computational Materials Sciences ( $\Delta = +\$4,000K$ ), and mid-scale instrumentation for ultrafast electron scattering ( $\Delta = +\$5,000K$ ).
- BER: Increases for Climate and Earth System Modeling with largest increase for Climate Model Development & Validation and Integrated Assessment. ( $\Delta = +\$18,730K$ ). Some decreases offset the increases.
- FES: Research continues in all areas. Increase for GPP for PPPL in support of NSTX-U operations. HEDLP is reduced, but the Matter in Extreme Conditions end station at LCLS remains fully funded.
- HEP: Research funding is nearly flat with FY 2015 and supports scientific results from operating experiments and R&D for future projects.
- NP: Research increases by more than 8% to support high-priority work.



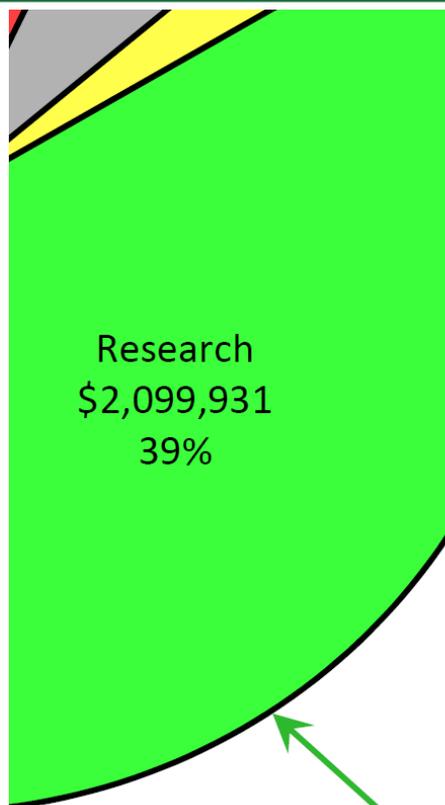
\*Other includes GPP/GPE amounts for BES, GPP for FES, Other (DOE/SC/Fermi/Lawrence) for NP, WDTS, SLI non-construction funding, S&S, and Program Direction.



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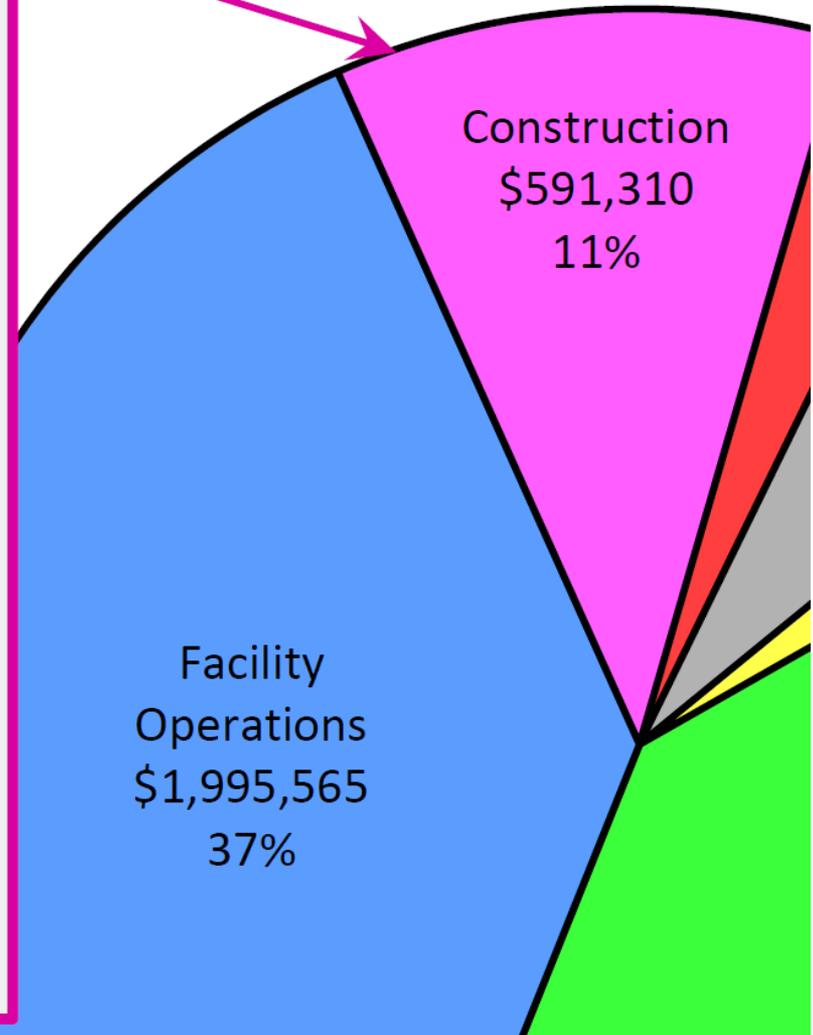
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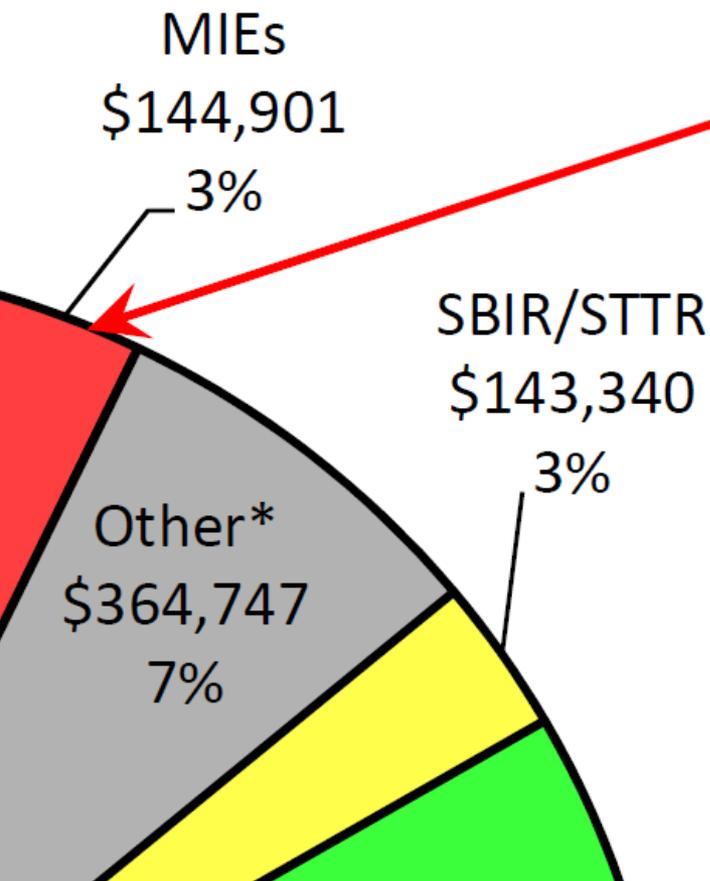
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