



U.S. DEPARTMENT OF
ENERGY

Office of
Science

Office of Science Update

Dr. Harriet Kung
Deputy Director for Science Programs
Office of Science
U.S. Department of Energy

April 16, 2020

Outline

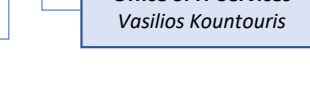
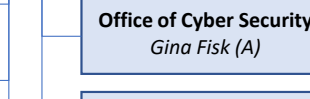
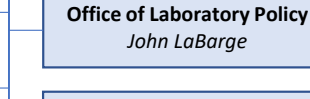
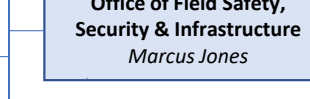
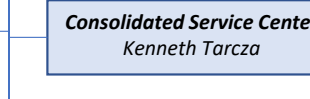
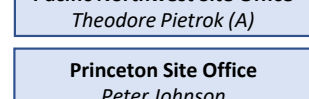
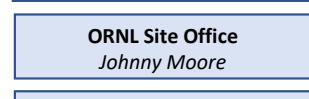
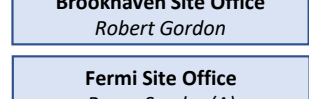
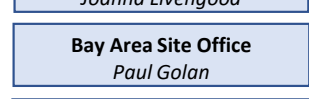
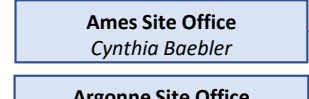
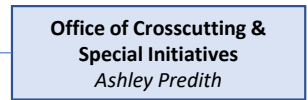
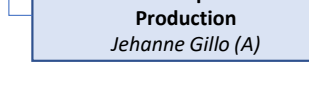
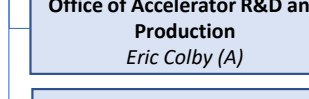
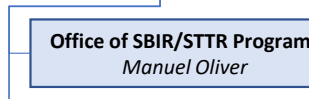
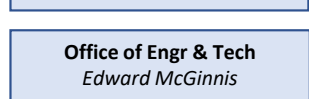
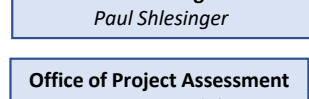
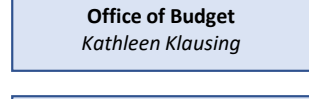
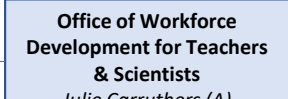
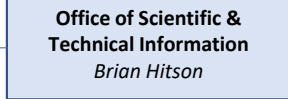
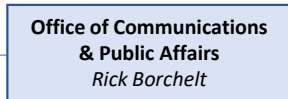
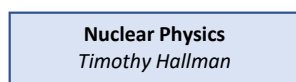
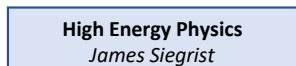
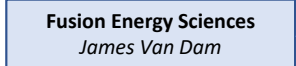
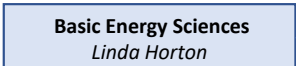
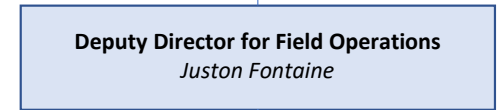
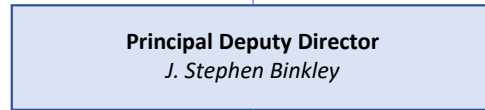
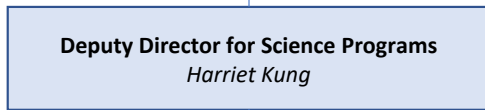
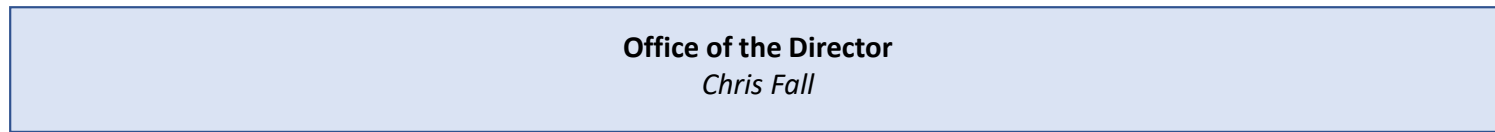
- **Office of Science Reorganization**
- **FY 2021 President's Budget Request**
- **COVID-19 S&T Response**

Office of Science Reorganization

- **Better aligns the organization to achieve strategic goals**
- **Mostly affects top levels of the organization**
- **Establishes the Principal Deputy Director position**
- **Eliminates the Deputy Director for Resource Management**
- **Minimal changes below the Deputy Director level**
- **Effective 4/12/2020**

Office of Science

04/13/2020



Office of Deputy Director for Science Programs (SC-3)

Deputy Director for Science Programs (SC-3)

Harriet Kung

Office of Advanced Scientific Computing Research (SC-31)
Barbara Helland

Office of Basic Energy Sciences (SC-32)
Linda Horton

Office of Biological & Environmental Research (SC-33)
Sharlene Weatherwax

Office of Fusion Energy Sciences (SC-34)
James Van Dam

Office of High Energy Physics (SC-35)
James Siegrist

Office of Nuclear Physics (SC-36)
Timothy Hallman

Office of Communications & Public Affairs (SC-3.1)
Rick Borchelt

Office of Scientific & Technical Information (SC-3.2)
Brian Hitson

Office of Workforce Development for Teachers & Scientists (SC-3.3)
Julie Carruthers (A)

Office of Grants & Contracts Support (SC-3.4)
Michael Zarkin

Computational Science Research & Partnerships (SC-31.1)
Ceren Susut (A)

Facilities (SC-31.2)
Vacant

Advanced Computing Technology (SC-31.3)
William Vanderlinde (A)

Chemical Sciences, Geosciences, & Biosciences (SC-32.1)
Bruce Garrett

Materials Sciences & Engineering (SC-32.2)
Linda Horton (A)

Scientific User Facilities (SC-32.3)
Linda Horton (A)

Earth & Environmental Systems Science (SC-33.1)
Gerald Geernaert

Biological Systems Science (SC-33.2)
Robert Anderson

Facilities, Operations & Projects (SC-34.1)
Joseph May

Research (SC-34.2)
John Mandrekas (A)

Research & Technology (SC-35.1)
Glen Crawford

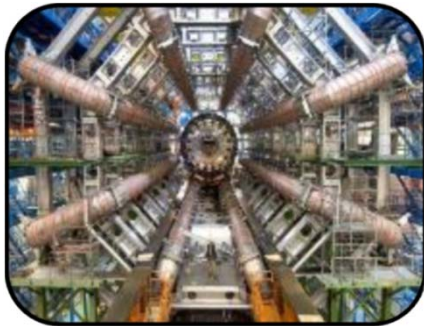
Facilities (SC-35.2)
Michael Procaro

Physics Research (SC-36.1)
Timothy Hallman (A)

Facilities & Project Management (SC-36.2)
Jehanne Gillo

Office of Science at a Glance

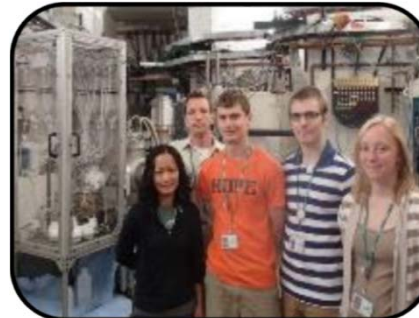
FY 2021 Request: \$5.838B



Largest Supporter of Physical Sciences in the U.S.



Funding at >300 Institutions, including 17 DOE Labs



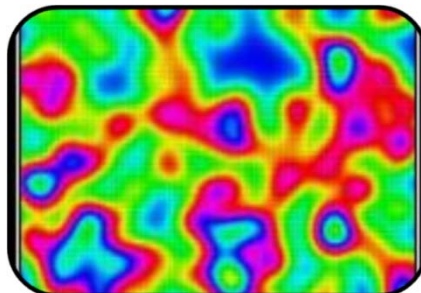
Over 23,000 Researchers Supported



Over 33,000 Users of 28 SC Scientific Facilities



~38% of Research to Universities



Research: 41.7%, \$2.432B



Facility Operations: 40.3%, \$2.352B



Projects/Other: 18.0%, \$1.054B

Office of Science Guiding Principles

FY 2019 Enacted: \$6.585B

FY 2020 Enacted: \$7.000B

FY 2021 Request: \$5.838B

Guiding Principles:

- The Office of Science's (SC) mission is to deliver scientific discoveries and major scientific tools to transform our understanding of nature and advance the energy, economic and national security of the United States.
- The FY 2021 Request supports a balanced research portfolio, focused on cutting edge, early stage research and development, probing some of the most fundamental questions in areas such as: high energy, nuclear, and plasma physics; materials and chemistry; biological and environmental systems; applied mathematics; next-generation high-performance computing and simulation capabilities; and basic research for advancement in new energy technologies.
- The future of the Office of Science includes:
 - New research investments
 - Reduce deferred maintenance with upgrades/improvements to infrastructure

Office of Science Priorities

- **Support high priority research investments**
 - Integrated Computational and Data Infrastructure for Scientific Discovery, Next Generation Biology Initiative, Rare Earth / Separation Science Initiative, Revolutionizing Polymer Upcycling, Strategic Accelerator Technology, and Data and Computational Collaboration with NIH.
- **Continue research investments** in Exascale Computing, Artificial Intelligence/ Machine Learning, Quantum Information Science, Microelectronics, DOE Isotope Initiative, Biosecurity, and U.S. Fusion Program Acceleration.
- **Continue operations of the national laboratories**
 - SC oversees the operation of 10 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.
 - Look to strengthen smaller/single purpose laboratories to be more multidiscipline.
 - Strengthen/upgrade core laboratory infrastructure, i.e. utilities and laboratory workspace.
- **Initiate new Infrastructure Projects**
 - Reduce backlog of deferred maintenance.
 - Improve obsolete infrastructure at National Laboratories.
- **Maintain all on-going line-item construction and MIE projects**

FY 2021 SC President's Budget Request

(Dollars in Thousands)

	FY 2019		FY 2020	FY 2021 President's Request	
	Enacted Approp.	Current Approp.	Enacted Approp.	President's Request	President's Request vs. FY 2020 Enacted
Office of Science					
Advanced Scientific Computing Research	935,500	910,031	980,000	988,051	+8,051 +0.8%
Basic Energy Sciences	2,166,000	2,105,873	2,213,000	1,935,673	-277,327 -12.5%
Biological and Environmental Research	705,000	680,246	750,000	516,934	-233,066 -31.1%
Fusion Energy Sciences	564,000	549,181	671,000	425,151	-245,849 -36.6%
High Energy Physics	980,000	955,905	1,045,000	818,131	-226,869 -21.7%
Nuclear Physics	690,000	669,888	713,000	653,327	-59,673 -8.4%
Workforce Development for Teachers and Scientists	22,500	22,500	28,000	20,500	-7,500 -26.8%
Science Laboratories Infrastructure	232,890	232,890	301,000	174,110	-126,890 -42.2%
Safeguards and Security	106,110	106,110	112,700	115,623	+2,923 +2.6%
Program Direction	183,000	183,000	186,300	190,306	+4,006 +2.2%
SBIR/STTR (SC)		169,376
Total Budget Authority and Obligations, Office of Science	6,585,000	6,585,000	7,000,000	5,837,806	-1,162,194 -16.6%
SBIR/STTR (DOE)	...	123,254
Total, Office of Science	6,585,000	6,708,254	7,000,000	5,837,806	-1,162,194 -16.6%

Office of Science - FY 2021 Research Initiatives

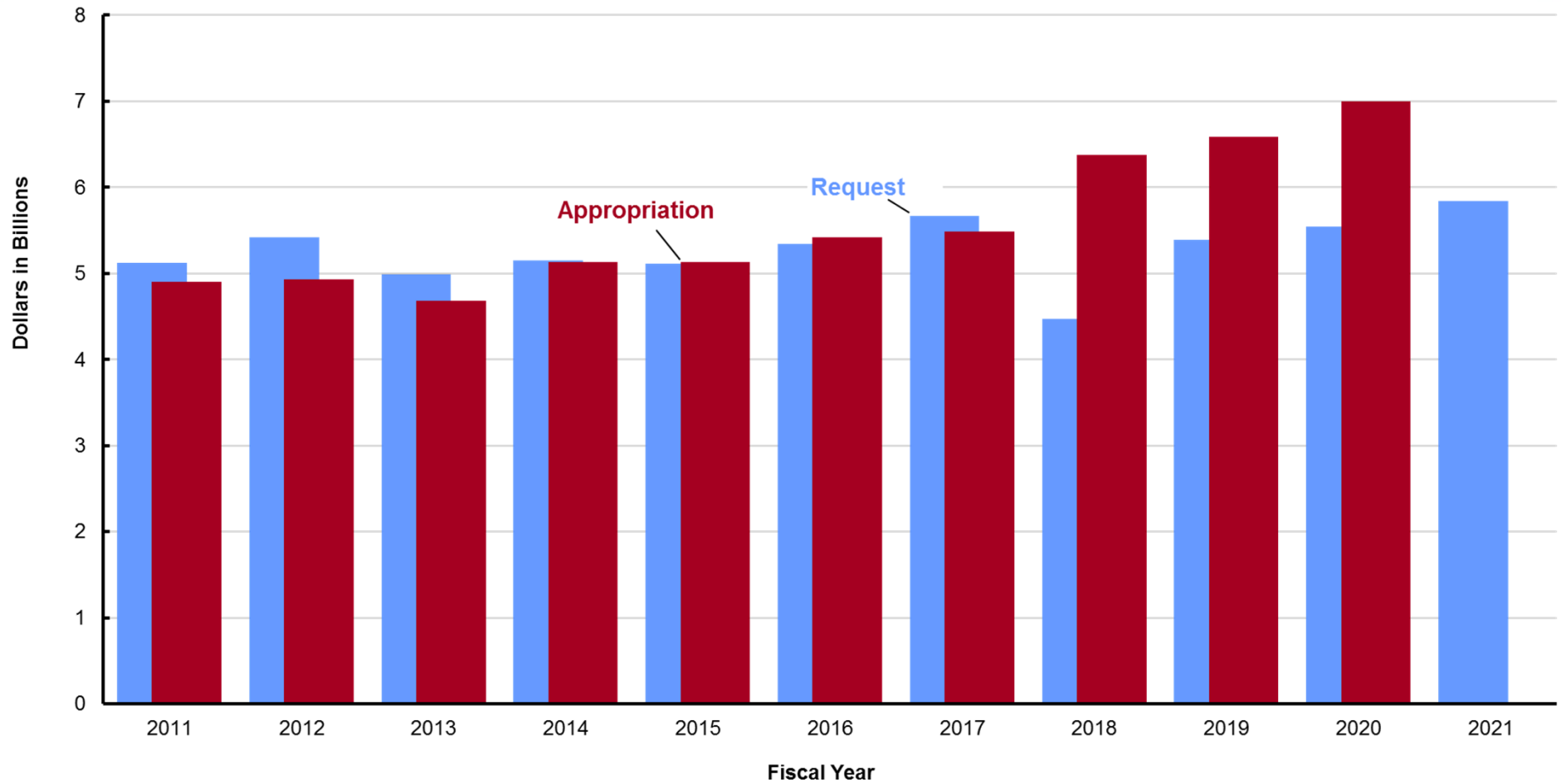
New Research Initiatives

1. Integrated Computational and Data Infrastructure for Scientific Discovery
- 2. Next Generation Biology Initiative**
3. Rare Earth / Separation Science Initiative
- 4. Revolutionizing Polymer Upcycling**
5. Strategic Accelerator Technology Initiative
6. Data and Computational Collaboration with NIH

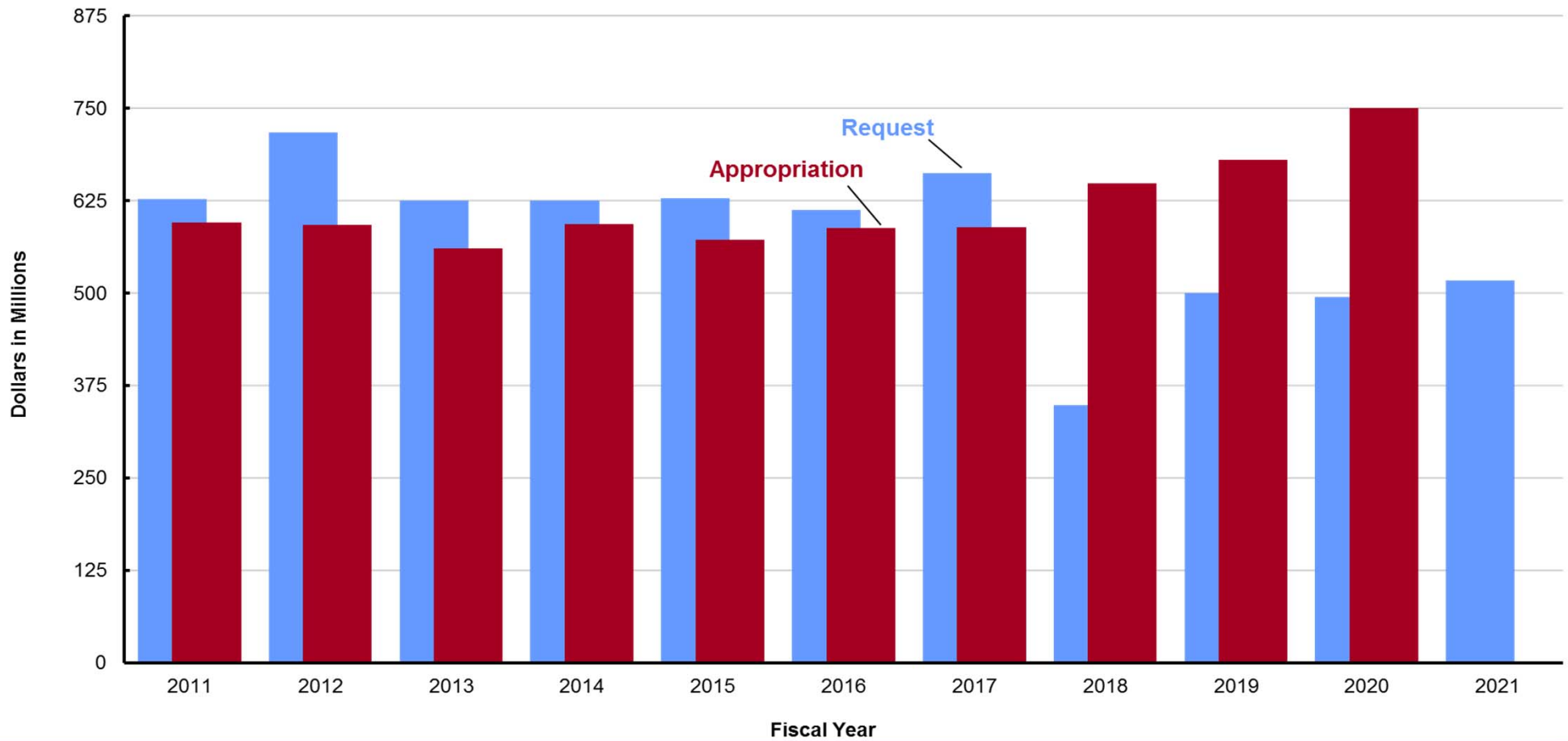
Ongoing Research Initiatives

- 1. Artificial Intelligence and Machine Learning**
- 2. Biosecurity**
3. DOE Isotope Initiative
- 4. Exascale Computing Initiative**
5. Microelectronics Innovation
- 6. Quantum Information Science**
7. U.S. Fusion Program Acceleration

Office of Science Request vs. Appropriation History*



Biological and Environmental Research Request vs. Appropriation History*



COVID-19 S&T Response



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**National Virtual Biotechnology
Laboratory (NVBL)**