



## InfoBrief

# R&D Spending at Federally Funded R&D Centers Increased by Largest Amount Since 2010

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The nation's 42 federally funded research and development centers (FFRDCs) spent nearly \$23 billion on research and development in FY 2019, an annual increase of 7.4% in current dollars ([table 1](#)). The federal government's share of support reached \$22.3 billion in FY 2019 and represented a 7.6% increase in federal R&D support to FFRDCs—the sixth consecutive year of nominal growth after performance declines in FYs 2011–13. In constant dollars, total FFRDC R&D expenditures rose an average of 3.4% from 2014 to 2019, including a 5.5% increase from FY 2018 to FY 2019 ([figure 1](#)). These increases are the largest since FY 2009 to FY 2010, when FFRDCs expended an additional \$1 billion on R&D funded by the American Recovery and Reinvestment Act of 2009.<sup>1</sup> These and the other statistics in this report come from the FY 2019 FFRDC Research and Development Survey, conducted by the National Center for Science and Engineering Statistics (NCSES) within the National Science Foundation (NSF).

**Table 1**

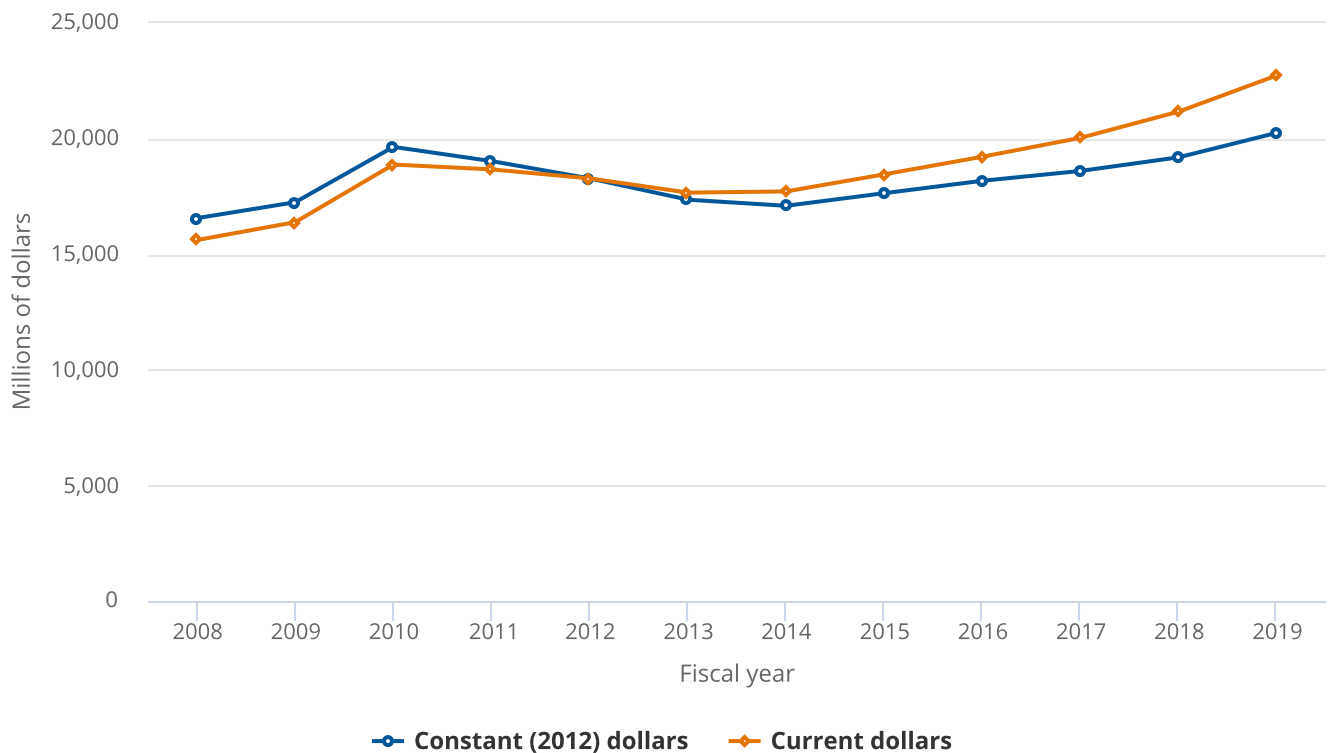
**R&D expenditures at federally funded research and development centers, by source of funds: FYs 2010–19**

(Thousands of current dollars)

Fiscal year	All R&D expenditures	Federal government	State and local government	Business	Nonprofit organizations	All other sources
2010	18,880,609	18,453,552	52,871	168,561	23,665	181,960
2011	18,671,245	18,276,088	26,744	190,111	38,878	139,424
2012	18,280,943	17,875,012	39,428	184,434	45,926	136,143
2013	17,667,184	17,284,513	50,449	186,911	39,390	105,921
2014	17,718,556	17,331,396	28,337	220,735	37,182	100,906
2015	18,458,257	18,097,189	18,427	208,780	27,984	105,877
2016	19,219,702	18,855,593	21,556	192,239	40,195	110,119
2017	20,038,307	19,667,804	29,029	192,107	46,526	102,841
2018	21,171,529	20,770,388	43,458	197,975	43,630	116,078
2019	22,737,500	22,338,855	51,167	180,583	48,238	118,657

**Source(s):**

National Center for Science and Engineering Statistics, FFRDC Research and Development Survey.

**Figure 1****Total R&D expenditures at federally funded research and development centers: FYs 2008–19****Source(s):**

National Center for Science and Engineering Statistics, FFRDC Research and Development Survey.

## R&D by Funding Source

FFRDCs are privately operated R&D organizations that are exclusively or substantially financed by the federal government. Over 98% (\$22.3 billion) of FFRDC R&D expenditures were funded by the federal government in FY 2019 ([table 1](#)). Nonfederal sources funded the remaining R&D, totaling about \$398.6 million, including businesses (\$180.6 million), nonprofit organizations (\$48.2 million), state and local governments (\$51.2 million), and all other sources (\$118.7 million), such as funds from foreign governments and foreign or U.S. universities.

## Federal Agency Sources of R&D Funding

Over 91% of the federally funded R&D expenditures at FFRDCs came from four agencies ([table 2](#)). The Department of Energy (\$11.4 billion) accounted for 51.1% of federally funded R&D spending. The Department of Defense (\$5.0 billion, 22.6%), National Aeronautics and Space Administration (\$2.9 billion, 12.9%), and the Department of Health and Human Services (\$1.0 billion, 4.7%), which includes the National Institutes of Health, were the only other agencies funding greater than \$1 billion. Almost \$2 billion of federally funded R&D came from agencies other than the largest four. FFRDCs identified 28 agencies as sources of federal funding.

**Table 2****Federally financed R&D expenditures at federally funded research and development centers, by federal agency: FY 2019**

(Thousands of current dollars)

FFRDC	All federal R&D expenditures
All FFRDCs	22,338,855
Agency for International Development	5,854
Central Intelligence Agency	1,401
Consumer Financial Protection Bureau	197
Department of Agriculture	4,454
Department of Commerce	91,371
Department of Defense	5,039,345
Department of Energy	11,417,801
Department of Health and Human Services	1,041,189
Department of Homeland Security	511,475
Department of Justice	25,380
Department of State	68,158
Department of the Interior	9,301
Department of the Treasury	99,091
Department of Transportation	200,993
Department of Veterans Affairs	88,437
Environmental Protection Agency	4,848
Federal Deposit Insurance Corporation	99
General Services Administration	1,896
Library of Congress	117
National Aeronautics and Space Administration	2,889,883
National Credit Union Administration	464
National Science Foundation	288,256
National Transportation Safety Board	2
Nuclear Regulatory Commission	44,044
Office of the Director of National Intelligence	18,353
Smithsonian Institution	29
U.S. Postal Service	2,152
United States Courts	7,331
Other agencies not listed	476,934

FFRDC = federally funded research and development center.

**Source(s):**

National Center for Science and Engineering Statistics, FFRDC Research and Development Survey, FY 2019.

**Expenditure Trends at Specific FFRDCs**

The majority of FFRDCs (36 centers) increased R&D spending in FY 2019, with 15 centers reporting an increase greater than 10% ([table 3](#)). Nine FFRDCs reported more than \$1 billion each (a combined \$15.8 billion) in R&D expenditures for FY 2019—the National Aeronautics and Space Administration–sponsored Jet Propulsion Laboratory; five Department of Energy–sponsored National Laboratories specializing in energy and the environment, national security, and nuclear science: Lawrence Livermore, Los Alamos, Oak Ridge, Pacific Northwest, and Sandia; three Department of Defense (DOD)–sponsored FFRDCs: Aerospace FFRDC, Lincoln Laboratory, and National Security Engineering Center. Sandia National Laboratories was the largest performer with almost \$3.4 billion in total R&D. Sandia National Laboratory and Los Alamos National Laboratory reported the largest dollar increases in R&D of any centers, increasing by \$364 million and \$316 million respectively in FY 2019. Six FFRDCs reported lower expenditures in FY 2019, although only two declined by more than 2%. Of the 41 FFRDCs listed continuously since 2016, 34 centers reported larger expenditures in FY 2019 compared to FY 2016.

**Table 3****R&D expenditures at federally funded research and development centers, by FFRDC: FYs 2016–19**

(Thousands of current dollars)

FFRDC	2016	2017	2018	2019	% change 2018–19
All FFRDCs	19,219,702	20,038,307	21,171,529	22,737,500	7.4
University-administered FFRDCs	5,669,908	6,155,252	6,715,338	6,946,262	3.4
Ames Laboratory	46,886	53,527	36,858	33,612	-8.8
Argonne National Laboratory	733,377	723,824	777,246	810,693	4.3
Fermi National Accelerator Laboratory	323,507	320,516	328,419	334,258	1.8
Jet Propulsion Laboratory	1,852,369	2,324,826	2,733,908	2,709,063	-0.9
Lawrence Berkeley National Laboratory	797,831	813,267	832,457	872,237	4.8
Lincoln Laboratory	949,138	969,090	1,013,320	1,103,870	8.9
National Center for Atmospheric Research	177,422	171,551	158,260	199,476	26.0
National Radio Astronomy Observatory	90,411	91,720	100,691	101,901	1.2
National Solar Observatory	12,783	11,841	14,733	15,931	8.1
NSF's National Optical-Infrared Astronomy Research Laboratory (NSF's NOIRLab)	24,917	25,906	33,874	38,262	13.0
Princeton Plasma Physics Laboratory	82,246	81,444	82,435	91,271	10.7
SLAC National Accelerator Laboratory	313,031	327,453	341,615	368,938	8.0
Software Engineering Institute	145,981	132,967	142,891	140,954	-1.4
Thomas Jefferson National Accelerator Facility	120,009	107,320	118,631	125,796	6.0
Nonprofit-administered FFRDCs	6,128,058	6,413,612	6,617,274	7,033,162	6.3
Aerospace Federally Funded Research and Development Center	909,868	942,704	1,020,827	1,065,989	4.4
Arroyo Center	44,616	42,723	39,738	37,956	-4.5
Brookhaven National Laboratory	579,087	556,875	552,640	590,470	6.8
Center for Advanced Aviation System Development	156,644	168,169	177,530	174,123	-1.9
Center for Communications and Computing	61,625	66,692	68,237	68,371	0.2
Center for Enterprise Modernization	146,436	154,933	162,690	174,712	7.4
Center for Naval Analyses	84,232	90,401	95,198	96,697	1.6
Center for Nuclear Waste Regulatory Analyses	8,600	6,312	5,054	6,987	38.2
CMS Alliance to Modernize Healthcare	141,860	169,013	175,030	213,369	21.9
Homeland Security Operational Analysis Center	na	8622	46,321	54,751	18.2
Homeland Security Studies and Analysis Institute	22,038	na	na	na	na
Homeland Security Systems Engineering and Development Institute	101,628	104,414	104,689	115,813	10.6
Judiciary Engineering and Modernization Center	9,289	8,030	6,697	7,331	9.5
National Biodefense Analysis and Countermeasures Center	32,902	34,991	37,598	39,003	3.7
National Cybersecurity Center of Excellence	13,076	13,436	19,556	22,205	13.5
National Defense Research Institute	62,848	69,013	57,743	67,647	17.2
National Renewable Energy Laboratory	362,087	357,916	388,500	455,016	17.1
National Security Engineering Center	966,542	1,012,155	1,078,610	1,124,861	4.3
Oak Ridge National Laboratory	1,283,729	1,403,204	1,399,445	1,470,372	5.1
Pacific Northwest National Laboratory	914,747	983,962	956,193	1,012,136	5.9
Project Air Force	49,165	48,521	48,858	48,325	-1.1
Science and Technology Policy Institute	7,459	8,401	8,086	9,080	12.3
Systems and Analyses Center	169,580	163,125	168,034	177,948	5.9
Industry-administered FFRDCs	7,421,736	7,469,443	7,838,917	8,758,076	11.7
Frederick National Laboratory for Cancer Research	642,165	704,223	748,500	751,452	0.4
Idaho National Laboratory	521,618	482,840	395,112	478,324	21.1
Lawrence Livermore National Laboratory	1,363,525	1,290,134	1,386,687	1,517,429	9.4
Los Alamos National Laboratory	1,987,000	1,972,769	2,145,232	2,461,275	14.7
Sandia National Laboratories	2,781,547	2,878,000	3,009,105	3,373,217	12.1
Savannah River National Laboratory	125,881	141,477	154,281	176,379	14.3

na = not applicable.

FFRDC = federally funded research and development center; NSF = National Science Foundation.

**Source(s):**

National Center for Science and Engineering Statistics, FFRDC Research and Development Survey.

## Expenditures, by Type of R&D

In FY 2019, basic research activities accounted for nearly 20% of total FFRDC R&D expenditures, more than 2 percentage points lower than in FY 2015 (table 4). The remaining R&D expenditures were divided fairly evenly between applied research and experimental development (at about 40 percent each). Overall, total basic research expenditures at FFRDCs increased by \$442 million in current dollars from FY 2015 to FY 2019. Applied research expenditures and experimental development each increased by \$1.9 billion during the same period.

**Table 4****Total and federally financed R&D expenditures at federally funded research and development centers, by type of R&D: FYs 2015–19**

(Millions of current dollars)

Fiscal year	All R&D expenditures	Basic research		Applied research		Experimental development	
		Amount	Percent	Amount	Percent	Amount	Percent
2015	18,458	4,094	22.2	7,292	39.5	7,072	38.3
2016	19,220	4,224	22.0	7,527	39.2	7,468	38.9
2017	20,038	4,111	20.5	7,931	39.6	7,996	39.9
2018	21,172	4,180	19.7	8,391	39.6	8,600	40.6
2019	22,738	4,536	19.9	9,200	40.5	9,002	39.6

**Note(s):**

Detail may not add to total because of rounding.

**Source(s):**

National Center for Science and Engineering Statistics, FFRDC Research and Development Survey.

## Data Sources, Limitations, and Availability

The statistics on FFRDC R&D expenditures presented in this report come from the FY 2019 FFRDC Research and Development Survey. This annual survey is completed by FFRDC administrators and collects data from FFRDCs on R&D expenditures by source of funds (federal government, state and local governments, businesses, nonprofit organizations, or other), type of R&D (basic research, applied research, or experimental development), and type of cost (salaries, software, equipment, subcontracts, or indirect costs). This survey has been a census of the full population of FFRDCs since FY 2001. For a list of criteria used to define the set of FFRDCs, see the general guidelines of the Master Government List of FFRDCs at <https://www.nsf.gov/statistics/ffrdclist/#guide&gennotes>.

The full set of data tables from this survey and more information on the survey methodology are available at <https://nces.nsf.gov/pubs/nsf21307/>.

## Note

1 Britt R; National Center for Science and Engineering Statistics (NCSES). 2012. *ARRA Funding Raises R&D Expenditures within Federally Funded R&D Centers 11% to 16.8 Billion in FY 2010*. NSF 12-315. Alexandria, VA: National Science Foundation. Available at <https://www.nsf.gov/statistics/infbrief/nsf12315/>. Yearly totals have been updated since this report was published. See the FY 2019 data tables for the most current estimates.

## Suggested Citation

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