



R&D Spending at Federally Funded R&D Centers Surpassed \$21 Billion in FY 2018

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The nation's 42 federally funded research and development centers (FFRDCs) spent more than \$21 billion on research and development in FY 2018, an annual increase of 5.7% in current dollars (table 1). The federal government's share of support approached \$20.8 billion in FY 2018 and represented a 5.6% increase in federal R&D support to FFRDCs—the fifth consecutive year of nominal growth after funding declines in FYs 2011–13. In constant dollars, total FFRDC R&D expenditures rose 3.1% from FY 2017 to FY 2018 (figure 1). Since FY 2008, total R&D spending at FFRDCs has increased at an average annual rate of 1.5% in constant dollars and 3.1% in current dollars. These and

the other statistics in this report come from the FY 2018 FFRDC Research and Development Survey, conducted by the National Center for Science and Engineering Statistics (NCSES) within the National Science Foundation (NSF).

R&D by Funding Source

FFRDCs are privately operated R&D organizations that are exclusively or substantially financed by the federal government. Over 98% (\$20.8 billion) of FFRDC R&D expenditures were funded by the federal government in FY 2018 (table 1). The remaining \$401.1 million was funded by nonfederal sources, including businesses (\$198.0 million), nonprofit organizations (\$43.6 million), state and local

governments (\$43.5 million), and all other sources (\$116.1 million), such as funds from foreign governments and foreign or U.S. universities.

Federal Agency Sources of R&D Funding

Over 95% of the federally funded R&D expenditures at FFRDCs came from seven agencies (table 2). The Department of Energy (DOE) accounted for 50.1% of this federally funded R&D spending. The Department of Defense (DOD) (\$4.5 billion) and the National Aeronautics and Space Administration (NASA) (\$2.9 billion) were the only other agencies funding greater than \$1 billion, although the Department of Health and Human Services, which includes the National Institutes of Health, funded R&D expenditures worth \$989.5 million, primarily to support the Frederick National Laboratory for Cancer Research. Around \$1 billion of federally funded R&D came from agencies other than the largest seven, or the federal sources were unidentified in the survey for security reasons. Sandia National Laboratories is notable due to the diversity of the large R&D totals funded by several federal agencies, in support of various national security related programs. Sandia conducted close to \$2 billion in R&D funded by DOE, \$833.2 million funded by DOD, \$49.8 million funded

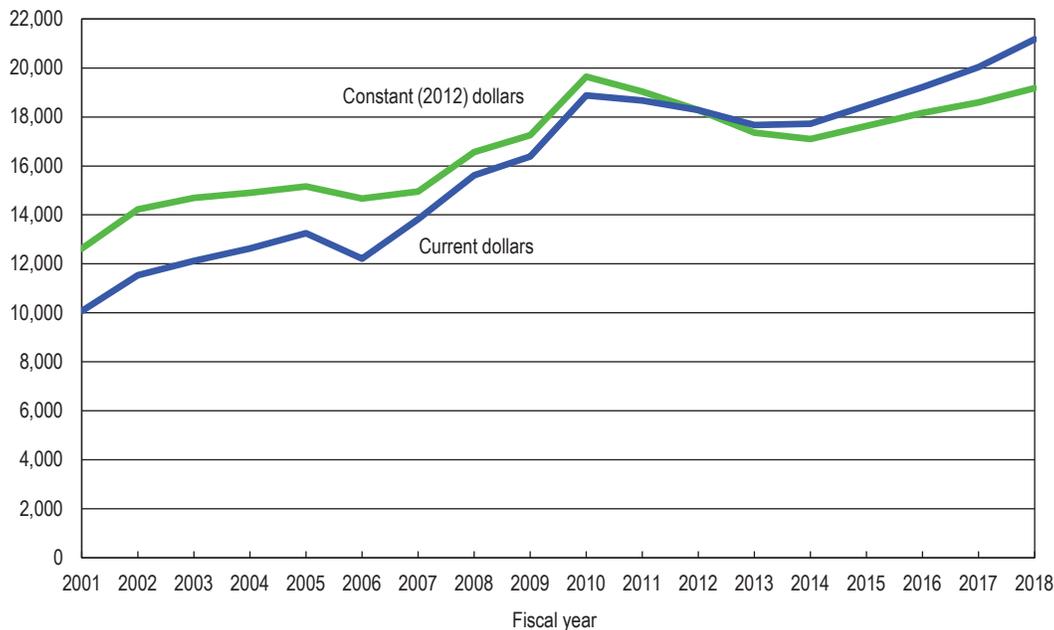
TABLE 1. R&D expenditures at federally funded research and development centers, by source of funds: FYs 2010–18

(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

SOURCE: 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 2001–18
(Millions of dollars)



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

by the Department of Homeland Security, and over \$100 million funded by other federal agencies.

Expenditure Trends at Specific FFRDCs

The majority of FFRDCs (31 centers) increased R&D spending in FY 2018, with 17 centers reporting an increase greater than the overall average of 5.7% (table 3). Eight FFRDCs reported more than \$1 billion each (a combined \$13.8 billion) in R&D expenditures for FY 2018—the NASA-sponsored Jet Propulsion Laboratory; four DOE-sponsored National Laboratories specializing in energy and the environment, national security, and nuclear science: Lawrence Livermore, Los Alamos, Oak Ridge, and Sandia; the DOD-sponsored National Security Engineering Center; Lincoln Laboratory (jointly sponsored by the DOD and the Office of the Secretary of Defense); and the

Aerospace FFRDC, which is jointly sponsored by DOD and the Air Force. Sandia National Laboratories was the largest performer with \$3 billion in total R&D. The Jet Propulsion Laboratory reported the largest dollar increase in R&D of any center, increasing by \$409 million in FY 2018, following a \$472.5 million increase in FY 2017. Eleven FFRDCs reported lower expenditures in FY 2018, although two of those declined by less than 1%. Of the 41 FFRDCs listed continuously since 2015, 33 centers reported greater expenditures in FY 2018 compared to FY 2015.

Data Sources, Limitations, and Availability

The statistics on FFRDC R&D expenditures presented in this report come from the FY 2018 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://ncesdata.nsf.gov/datatables/ffrdcrd/2018/>.

TABLE 2. Federally financed R&D expenditures at federally funded research and development centers, by federal agency and FFRDC: FY 2018
(Thousands of current dollars)

FFRDC	All federal R&D expenditures	DOD	DOE	HHS	DHS	DOT	NASA	NSF	Other
All FFRDCs	20,770,388	4,474,684	10,398,348	989,479	542,355	175,460	2,938,629	247,629	1,003,804
University-administered FFRDCs	6,560,094	987,981	2,281,061	33,818	104,514	8,822	2,782,169	237,460	124,269
Ames Laboratory	35,696	0	35,449	0	0	0	0	0	247
Argonne National Laboratory	747,349	19,215	667,285	4,672	28,064	3,099	479	2,586	21,949
Fermi National Accelerator Laboratory	327,630	938	326,552	0	64	0	17	59	0
Jet Propulsion Laboratory	2,733,908	0	0	0	0	0	2,733,908	0	0
Lawrence Berkeley National Laboratory	769,839	11,582	723,203	24,643	3,012	0	3,833	0	3,566
Lincoln Laboratory	1,001,849	862,555	2,078	0	30,851	0	31,887	0	74,478
National Center for Atmospheric Research	139,532	5,625	4,027	100	0	5,346	9,361	101,293	13,780
National Optical Astronomy Observatory	24,172	46	2,498	0	0	0	328	21,300	0
National Radio Astronomy Observatory	98,642	529	0	0	0	0	603	97,510	0
National Solar Observatory	14,027	0	0	0	0	0	664	13,321	42
Princeton Plasma Physics Laboratory	82,057	223	81,052	0	0	0	752	21	9
SLAC National Accelerator Laboratory	326,587	1,601	319,922	3,515	0	0	181	1,368	0
Software Engineering Institute	142,877	85,624	3,155	888	42,523	377	112	0	10,198
Thomas Jefferson National Accelerator Facility	115,929	43	115,840	0	0	0	44	2	0
Nonprofit-administered FFRDCs	6,490,564	2,358,905	2,698,015	197,815	287,593	164,357	97,193	10,169	676,517
Aerospace Federally Funded Research and Development Center	1,018,425	906,077	9,571	0	5,567	659	58,514	1,474	36,563
Arroyo Center	39,738	39,738	0	0	0	0	0	0	0
Brookhaven National Laboratory	525,170	138	499,070	3,865	1,294	0	7,836	0	12,967
Center for Advanced Aviation System Development	156,437	0	0	0	0	156,437	0	0	0
Center for Communications and Computing	68,237	68,237	0	0	0	0	0	0	0
Center for Enterprise Modernization	161,448	0	0	0	0	0	391	0	161,057
Center for Naval Analyses	95,198	95,198	0	0	0	0	0	0	0
Center for Nuclear Waste Regulatory Analyses	4,647	1	2	0	0	91	0	0	4,553
CMS Alliance to Modernize Healthcare	175,030	0	0	175,030	0	0	0	0	0
Homeland Security Operational Analysis Center	46,321	0	0	0	46,321	0	0	0	0
Homeland Security Systems Engineering and Development Institute	104,689	0	0	0	104,689	0	0	0	0
Judiciary Engineering and Modernization Center	6,697	0	0	0	0	0	0	0	6,697
National Biodefense Analysis and Countermeasures Center	37,598	0	0	0	37,598	0	0	0	0
National Cybersecurity Center of Excellence	19,556	0	0	0	0	0	0	0	19,556
National Defense Research Institute	57,743	56,349	0	0	563	0	0	0	831
National Renewable Energy Laboratory	349,410	8,636	324,591	0	185	969	177	0	14,852
National Security Engineering Center	1,077,697	862,330	293	0	49	0	108	0	214,917
Oak Ridge National Laboratory	1,378,398	27,034	1,179,439	6,257	16,330	6,117	28,733	0	114,488
Pacific Northwest National Laboratory	943,147	78,275	685,049	12,663	74,997	84	1,434	609	90,036
Project Air Force	48,858	48,858	0	0	0	0	0	0	0
Science and Technology Policy Institute	8,086	0	0	0	0	0	0	8,086	0
Systems and Analyses Center	168,034	168,034	0	0	0	0	0	0	0
Industry-administered FFRDCs	7,719,730	1,127,798	5,419,272	757,846	150,248	2,281	59,267	0	203,018
Frederick National Laboratory for Cancer Research	748,500	1,208	0	747,291	0	0	0	0	1
Idaho National Laboratory	376,053	47,526	260,233	1	47,621	0	583	0	20,089
Lawrence Livermore National Laboratory	1,353,502	190,789	1,118,727	3,507	32,185	0	1,819	0	6,475
Los Alamos National Laboratory	2,120,857	40,950	1,933,691	6,393	14,466	0	53,975	0	71,382
Sandia National Laboratories	2,967,822	833,246	1,974,503	654	49,769	2,281	2,890	0	104,479
Savannah River National Laboratory	152,996	14,079	132,118	0	6,207	0	0	0	592

DHS = Department of Homeland Security; DOD = Department of Defense; DOE = Department of Energy; DOT = Department of Transportation; FFRDC = federally funded research and development center; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation.

SOURCE: National Center for Science and Engineering Statistics, FFRDC Research and Development Survey, FY 2018.

TABLE 3. R&D expenditures at federally funded research and development centers, by FFRDC: FYs 2015–18
(Thousands of current dollars)

FFRDC	2015	2016	2017	2018	% change 2017–18
All FFRDCs	18,458,257	19,219,702	20,038,307	21,171,529	5.7
University-administered FFRDCs	5,483,466	5,669,908	6,155,252	6,715,338	9.1
Ames Laboratory	45,845	46,886	53,527	36,858	-31.1
Argonne National Laboratory	719,521	733,377	723,824	777,246	7.4
Fermi National Accelerator Laboratory	319,700	323,507	320,516	328,419	2.5
Jet Propulsion Laboratory	1,749,689	1,852,369	2,324,826	2,733,908	17.6
Lawrence Berkeley National Laboratory	792,457	797,831	813,267	832,457	2.4
Lincoln Laboratory	914,071	949,138	969,090	1,013,320	4.6
National Center for Atmospheric Research	166,385	177,422	171,551	158,260	-7.7
National Optical Astronomy Observatory	23,660	24,917	25,906	33,874	30.8
National Radio Astronomy Observatory	89,689	90,411	91,720	100,691	9.8
National Solar Observatory	11,752	12,783	11,841	14,733	24.4
Princeton Plasma Physics Laboratory	81,348	82,246	81,444	82,435	1.2
SLAC National Accelerator Laboratory	310,167	313,031	327,453	341,615	4.3
Software Engineering Institute	131,146	145,981	132,967	142,891	7.5
Thomas Jefferson National Accelerator Facility	128,036	120,009	107,320	118,631	10.5
Nonprofit-administered FFRDCs	6,121,483	6,128,058	6,413,612	6,617,274	3.2
Aerospace Federally Funded Research and Development Center	888,119	909,868	942,704	1,020,827	8.3
Arroyo Center	40,594	44,616	42,723	39,738	-7.0
Brookhaven National Laboratory	587,194	579,087	556,875	552,640	-0.8
Center for Advanced Aviation System Development	155,696	156,644	168,169	177,530	5.6
Center for Communications and Computing	56,478	61,625	66,692	68,237	2.3
Center for Enterprise Modernization	145,442	146,436	154,933	162,690	5.0
Center for Naval Analyses	80,358	84,232	90,401	95,198	5.3
Center for Nuclear Waste Regulatory Analyses	12,636	8,600	6,312	5,054	-19.9
CMS Alliance to Modernize Healthcare	168,142	141,860	169,013	175,030	3.6
Homeland Security Operational Analysis Center	na	na	8,622	46,321	437.2
Homeland Security Studies and Analysis Institute	16,965	22,038	na	na	na
Homeland Security Systems Engineering and Development Institute	77,176	101,628	104,414	104,689	0.3
Judiciary Engineering and Modernization Center	4,318	9,289	8,030	6,697	-16.6
National Biodefense Analysis and Countermeasures Center	30,716	32,902	34,991	37,598	7.5
National Cybersecurity Center of Excellence	7,843	13,076	13,436	19,556	45.5
National Defense Research Institute	56,736	62,848	69,013	57,743	-16.3
National Renewable Energy Laboratory	378,436	362,087	357,916	388,500	8.5
National Security Engineering Center	919,441	966,542	1,012,155	1,078,610	6.6
Oak Ridge National Laboratory	1,333,332	1,283,729	1,403,204	1,399,445	-0.3
Pacific Northwest National Laboratory	951,099	914,747	983,962	956,193	-2.8
Project Air Force	44,393	49,165	48,521	48,858	0.7
Science and Technology Policy Institute	8,724	7,459	8,401	8,086	-3.7
Systems and Analyses Center	157,645	169,580	163,125	168,034	3.0
Industry-administered FFRDCs	6,853,308	7,421,736	7,469,443	7,838,917	4.9
Frederick National Laboratory for Cancer Research	495,300	642,165	704,223	748,500	6.3
Idaho National Laboratory	476,376	521,618	482,840	395,112	-18.2
Lawrence Livermore National Laboratory	1,273,066	1,363,525	1,290,134	1,386,687	7.5
Los Alamos National Laboratory	1,865,000	1,987,000	1,972,769	2,145,232	8.7
Sandia National Laboratories	2,621,891	2,781,547	2,878,000	3,009,105	4.6
Savannah River National Laboratory	121,675	125,881	141,477	154,281	9.1

na = not applicable.

FFRDC = federally funded research and development center.

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

Note

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