



InfoBrief

Federally Funded R&D Centers Spent \$26.5 Billion on R&D in FY 2022

NSF 23-348 | September 2023

Michael T. Gibbons

The nation's 42 federally funded research and development centers (FFRDCs) spent \$26.5 billion on research and development (R&D) in FY 2022, an annual increase of 6.4% in current dollars ([table 1](#)). The federal government funded \$26.0 billion of the R&D total, which represented a 5.9% increase in federal R&D support to FFRDCs. FY 2022 was the ninth consecutive year of nominal growth after 2 years of performance declines in FYs 2011–13.¹ In constant dollars, total FFRDC R&D expenditures rose an average of 1.3% annually from FY 2012 to FY 2022 although the annual rate slowed to 0.4% from FY 2020 to FY 2022 ([figure 1](#)). These and the other statistics in this report come from the FY 2022 FFRDC Research and Development Survey, conducted by the National Center for Science and Engineering Statistics within the National Science Foundation.

Table 1

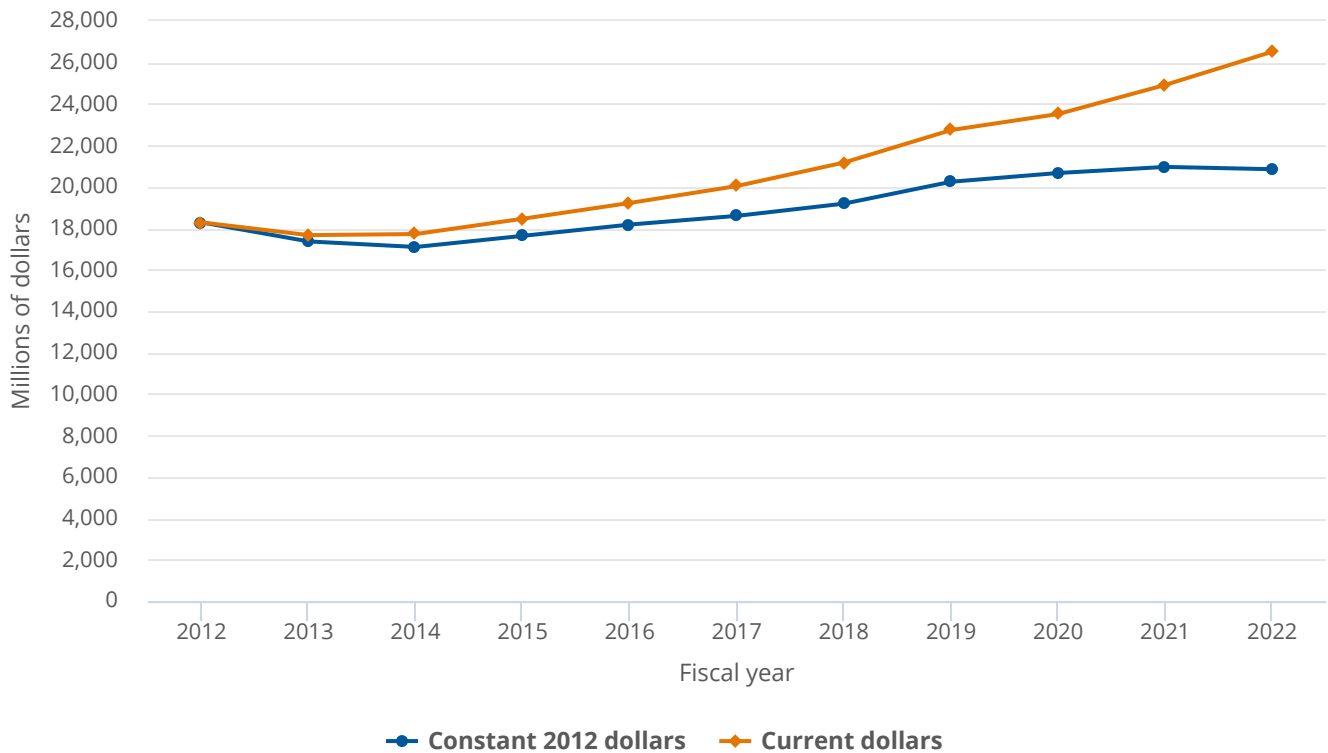
R&D expenditures at federally funded research and development centers, by source of funds: FYs 2012–22

(Thousands of current dollars)

| Fiscal year | All R&D expenditures | Federal government | State and local government | Business | Nonprofit organizations | All other sources |
|-------------|----------------------|--------------------|----------------------------|----------|-------------------------|-------------------|
| 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 |
| 2020 | 23,514,241 | 23,133,501 | 43,995 | 172,866 | 47,056 | 116,823 |
| 2021 | 24,921,476 | 24,509,691 | 43,774 | 195,954 | 49,016 | 123,041 |
| 2022 | 26,524,014 | 25,962,005 | 38,591 | 367,712 | 49,120 | 106,586 |

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 2012–22****Source(s):**

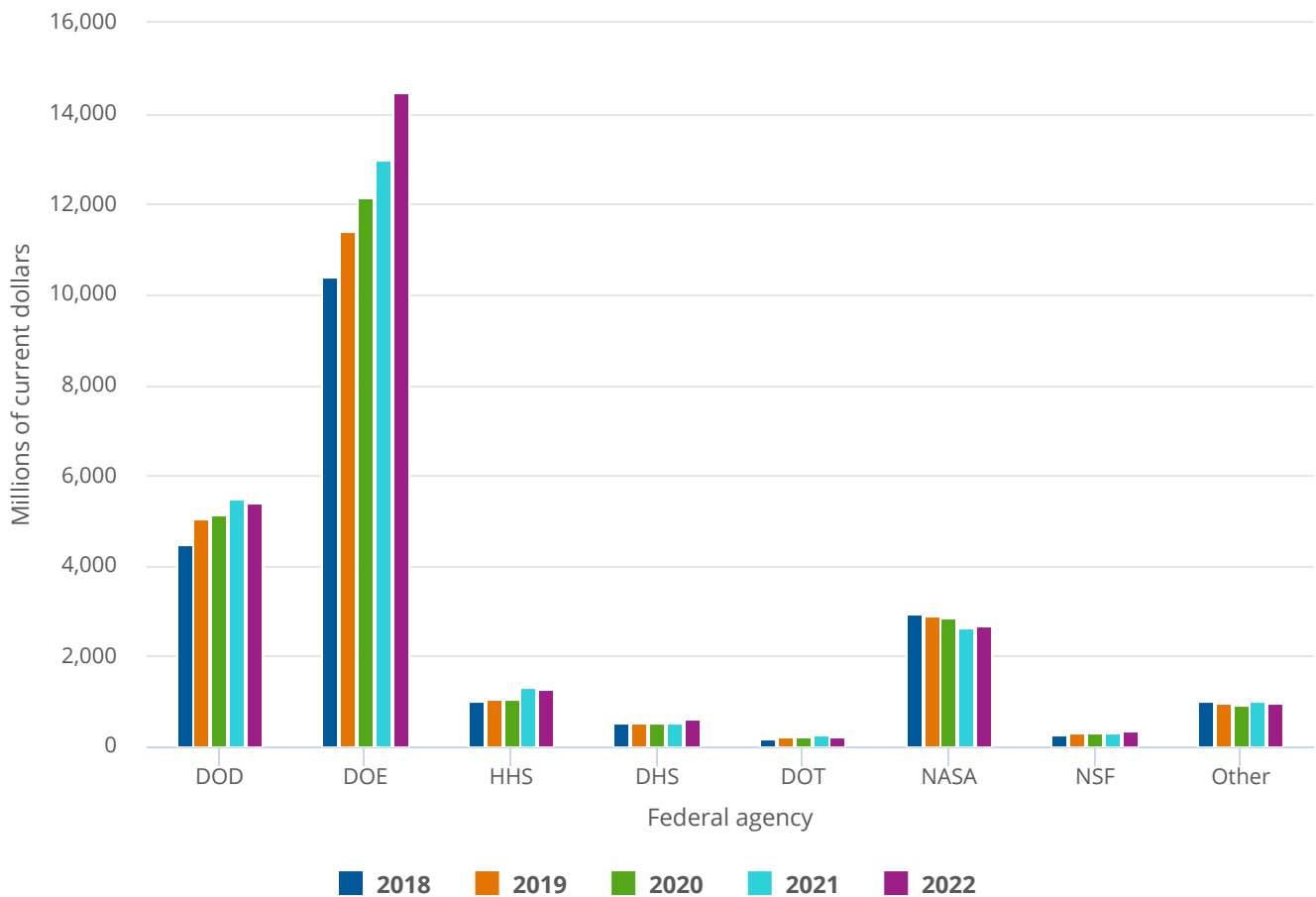
National Center for Science and Engineering Statistics, FFRDC Research and Development Survey.

R&D by Funding Source

Federal funding sources accounted for 97.9% (\$26.0 billion) of FFRDC R&D expenditures in FY 2022 ([table 1](#)). This level of support is typical for FFRDCs, which are privately operated R&D organizations that are exclusively or substantially financed by the federal government. Nonfederal sources funded the remaining R&D, totaling \$562.0 million, including businesses (\$367.7 million); nonprofit organizations (\$49.1 million); state and local governments (\$38.6 million); and all other sources (\$106.6 million), such as funds from foreign governments and foreign or U.S. universities. The most notable change in the nonfederal funding sectors since FY 2021 was the 87.7% increase in R&D expenditures funded by businesses, which was attributable primarily to the \$157.9 million increase at Los Alamos National Laboratory.²

Federal Agency Sources of R&D Funding

Four agencies accounted for 91.8% of federally funded R&D expenditures at FFRDCs: the Department of Energy (DOE), Department of Defense (DOD), National Aeronautics and Space Administration (NASA), and Department of Health and Human Services (HHS) ([figure 2](#)). DOE accounted for 55.8% (\$14.5 billion) of federally funded R&D spending. DOD (\$5.4 billion, or 20.8%); NASA (\$2.7 billion, or 10.3%); and HHS (\$1.3 billion, or 4.9%), which includes the National Institutes of Health, were the only other agencies funding expenditures greater than \$1 billion in FY 2022.

Figure 2**Federally financed R&D expenditures at federally funded research and development centers, by federal agency: FYs 2018–2022**

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

Source(s):

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

DOD funded R&D at more FFRDCs (31) than any other federal agency, followed by DOE (24) and NASA (23) (table 2). DOD-funded R&D surpassed \$1 billion at three FFRDCs in FY 2022. DOE-funded R&D surpassed \$1 billion at four FFRDCs, while five other FFRDCs surpassed \$500 million in R&D funded by DOE. Three FFRDCs accounted for at least 70% of their sponsoring agency's total funding to FFRDCs in FY 2022:

- Jet Propulsion Laboratory accounted for 91% (\$2.4 billion) of NASA-funded expenditures at FFRDCs,
- Center for Advanced Aviation System Development accounted for 79% (\$165 million) of the Department of Transportation's funding of FFRDC expenditures,
- Frederick National Laboratory for Cancer Research accounted for 71% (\$904 million) of HHS-funded FFRDC expenditures.

Table 2**Federally financed R&D expenditures at federally funded research and development centers, by federal agency and FFRDC: FY 2022**

(Thousands of current dollars)

| FFRDC | All federal R&D expenditures | DOD | DOE | HHS | DHS | DOT | NASA | NSF | Other |
|---|------------------------------|-----------|-----------|---------|--------|-------|--------|-------|---------|
| National Defense Research Institute | 61,097 | 59,151 | 0 | 0 | 0 | 212 | 0 | 0 | 1,734 |
| National Renewable Energy Laboratory | 536,683 | 11,882 | 505,161 | 145 | 4,652 | 780 | 953 | 0 | 13,110 |
| National Security Engineering Center | 1,282,762 | 1,091,302 | 0 | 0 | 0 | 0 | 0 | 0 | 191,460 |
| Oak Ridge National Laboratory | 1,789,100 | 54,508 | 1,574,496 | 6,379 | 11,040 | 2,762 | 27,561 | 244 | 112,110 |
| Pacific Northwest National Laboratory | 1,266,328 | 172,623 | 969,783 | 24,010 | 80,943 | 0 | 1,811 | 632 | 16,526 |
| Project Air Force | 46,517 | 46,517 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Savannah River National Laboratory | 179,848 | 23,503 | 151,107 | 0 | 2,108 | 0 | 0 | 0 | 3,130 |
| Science and Technology Policy Institute | 10,593 | 66 | 292 | 813 | 650 | 0 | 414 | 5,591 | 2,767 |
| Systems and Analyses Center | 200,679 | 178,958 | 2,741 | 0 | 11,774 | 0 | 192 | 0 | 7,014 |
| Industry-administered FFRDCs | 9,947,548 | 1,297,824 | 7,354,391 | 917,447 | 93,562 | 1,285 | 70,986 | 0 | 212,053 |
| Frederick National Laboratory for Cancer Research | 904,182 | 154 | 0 | 904,027 | 0 | 0 | 0 | 0 | 1 |
| Lawrence Livermore National Laboratory | 1,633,185 | 307,749 | 1,278,991 | 6,652 | 26,985 | 0 | 5,227 | 0 | 7,581 |
| Los Alamos National Laboratory | 3,629,955 | 73,607 | 3,395,021 | 5,056 | 3,843 | 0 | 64,508 | 0 | 87,920 |
| Sandia National Laboratories | 3,780,226 | 916,314 | 2,680,379 | 1,712 | 62,734 | 1,285 | 1,251 | 0 | 116,551 |

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(s):

National Center for Science and Engineering Statistics, FFRDC Research and Development Survey, FY 2021.

Expenditure Trends at Specific FFRDCs

FFRDCs spent \$5.4 billion more on R&D in FY 2022 than in FY 2018, with all but six reporting higher totals over this period ([table 3](#)). The majority of FFRDCs (31 centers) increased R&D spending in FY 2022 compared with FY 2021; 11 FFRDCs reported lower R&D totals in FY 2022 than in FY 2021. Ten FFRDCs reported more than \$1 billion each (a combined \$19.4 billion) in R&D expenditures for FY 2022—the NASA-sponsored Jet Propulsion Laboratory; six DOE-sponsored national laboratories specializing in energy and the environment, national security, and nuclear science (Lawrence Berkeley, Lawrence Livermore, Los Alamos, Oak Ridge, Pacific Northwest, and Sandia National Laboratories); the DOD-sponsored National Security Engineering Center and Lincoln Laboratory; and the Aerospace FFRDC, which is jointly sponsored by DOD and the Air Force.³ Los Alamos National Laboratory and Sandia National Laboratories were the two largest performers, each with more than \$3.8 billion in total R&D. From FY 2021, Los Alamos increased its R&D performance by \$837 million and Sandia increased by \$269 million. Three other FFRDCs reported R&D expenditure increases greater than \$100 million: Pacific Northwest National Laboratory (\$126 million), Idaho National Laboratory (\$121 million), and Argonne National Laboratory (\$106 million).

Table 3**R&D expenditures at federally funded research and development centers, by FFRDC: FYs 2018–22**

(Thousands of current dollars)

| FFRDC | 2018 | 2019 | 2020 | 2021 | 2022 | % change 2021–22 |
|---|------------|------------|------------|------------|------------|------------------|
| All FFRDCs | 21,171,529 | 22,737,500 | 23,514,241 | 24,921,476 | 26,524,014 | 6.4 |
| University-administered FFRDCs | 6,715,338 | 6,946,262 | 7,003,132 | 6,850,276 | 7,165,067 | 4.6 |
| Ames Laboratory | 36,858 | 33,612 | 32,844 | 34,214 | 38,520 | 12.6 |
| Argonne National Laboratory | 777,246 | 810,693 | 859,658 | 856,568 | 962,973 | 12.4 |
| Fermi National Accelerator Laboratory | 328,419 | 334,258 | 300,002 | 319,051 | 330,294 | 3.5 |
| Green Bank Observatory ^a | NA | NA | NA | 8,629 | 10,752 | 24.6 |
| Jet Propulsion Laboratory | 2,733,908 | 2,709,063 | 2,638,412 | 2,388,355 | 2,417,556 | 1.2 |
| Lawrence Berkeley National Laboratory | 832,457 | 872,237 | 916,082 | 966,972 | 1,031,716 | 6.7 |
| Lincoln Laboratory | 1,013,320 | 1,103,870 | 1,115,927 | 1,136,133 | 1,142,615 | 0.6 |
| National Center for Atmospheric Research | 158,260 | 199,476 | 188,484 | 181,010 | 188,238 | 4.0 |
| National Radio Astronomy Observatory | 100,691 | 101,901 | 100,078 | 94,202 | 92,476 | -1.8 |
| National Solar Observatory | 14,733 | 15,931 | 16,892 | 17,684 | 33,849 | 91.4 |
| NSF's National Optical-Infrared Astronomy Research Laboratory (NSF's NOIRLab) | 33,874 | 38,262 | 72,686 | 75,251 | 81,505 | 8.3 |
| Princeton Plasma Physics Laboratory | 82,435 | 91,271 | 107,662 | 115,505 | 120,347 | 4.2 |
| SLAC National Accelerator Laboratory | 341,615 | 368,938 | 382,264 | 396,780 | 432,078 | 8.9 |
| Software Engineering Institute | 142,891 | 140,954 | 141,291 | 120,443 | 129,316 | 7.4 |
| Thomas Jefferson National Accelerator Facility | 118,631 | 125,796 | 130,850 | 139,479 | 152,832 | 9.6 |
| Nonprofit-administered FFRDCs | 6,617,274 | 7,511,486 | 7,913,603 | 9,079,002 | 9,171,826 | 1.0 |
| Aerospace Federally Funded Research and Development Center | 1,020,827 | 1,065,989 | 1,114,741 | 1,128,241 | 1,152,833 | 2.2 |
| Arroyo Center | 39,738 | 37,956 | 35,248 | 38,304 | 40,856 | 6.7 |
| Brookhaven National Laboratory | 552,640 | 590,470 | 595,466 | 637,658 | 655,988 | 2.9 |
| Center for Advanced Aviation System Development | 177,530 | 174,123 | 180,634 | 230,484 | 189,490 | -17.8 |
| Center for Communications and Computing | 68,237 | 68,371 | 67,072 | 65,255 | 74,759 | 14.6 |
| Center for Enterprise Modernization | 162,690 | 174,712 | 190,408 | 263,661 | 235,436 | -10.7 |
| Center for Naval Analyses | 95,198 | 96,697 | 95,874 | 96,391 | 93,567 | -2.9 |
| Center for Nuclear Waste Regulatory Analyses | 5,054 | 6,987 | 6,762 | 5,630 | 4,323 | -23.2 |
| CMS Alliance to Modernize Healthcare | 175,030 | 213,369 | 228,162 | 348,269 | 286,693 | -17.7 |
| Homeland Security Operational Analysis Center | 46,321 | 54,751 | 44,736 | 34,888 | 52,984 | 51.9 |
| Homeland Security Systems Engineering and Development Institute | 104,689 | 115,813 | 136,874 | 183,588 | 183,261 | -0.2 |
| Idaho National Laboratory | 395,112 | 478,324 | 494,094 | 516,691 | 637,579 | 23.4 |
| Judiciary Engineering Modernization Center ^b | 6,697 | 7,331 | 6,765 | 5,493 | na | na |
| National Biodefense Analysis and Countermeasures Center | 37,598 | 39,003 | 42,330 | 44,968 | 45,870 | 2.0 |
| National Cybersecurity Center of Excellence | 19,556 | 22,205 | 23,557 | 33,671 | 27,955 | -17.0 |
| National Defense Research Institute | 57,743 | 67,647 | 64,134 | 66,170 | 61,097 | -7.7 |
| National Renewable Energy Laboratory | 388,500 | 455,016 | 511,585 | 559,151 | 603,356 | 7.9 |
| National Security Engineering Center | 1,078,610 | 1,124,861 | 1,143,701 | 1,468,298 | 1,286,520 | -12.4 |
| Oak Ridge National Laboratory | 1,399,445 | 1,470,372 | 1,632,684 | 1,760,578 | 1,803,543 | 2.4 |
| Pacific Northwest National Laboratory | 956,193 | 1,012,136 | 1,071,249 | 1,168,268 | 1,294,614 | 10.8 |
| Project Air Force | 48,858 | 48,325 | 46,936 | 47,966 | 46,517 | -3.0 |
| Savannah River National Laboratory ^c | na | na | na | 191,803 | 182,654 | -4.8 |
| Science and Technology Policy Institute | 8,086 | 9,080 | 9,256 | 9,784 | 10,593 | 8.3 |
| Systems and Analyses Center | 168,034 | 177,948 | 171,335 | 173,792 | 201,338 | 15.8 |
| Industry-administered FFRDCs | 7,838,917 | 8,279,752 | 8,597,506 | 8,992,198 | 10,187,121 | 13.3 |
| Frederick National Laboratory for Cancer Research | 748,500 | 751,452 | 745,726 | 861,605 | 904,182 | 4.9 |
| Lawrence Livermore National Laboratory | 1,386,687 | 1,517,429 | 1,558,071 | 1,613,673 | 1,659,808 | 2.9 |

Table 3**R&D expenditures at federally funded research and development centers, by FFRDC: FYs 2018–22**

(Thousands of current dollars)

| FFRDC | 2018 | 2019 | 2020 | 2021 | 2022 | % change 2021–22 |
|---|-----------|-----------|-----------|-----------|-----------|------------------|
| Los Alamos National Laboratory | 2,145,232 | 2,461,275 | 2,722,375 | 2,974,164 | 3,811,602 | 28.2 |
| Sandia National Laboratories | 3,009,105 | 3,373,217 | 3,395,241 | 3,542,756 | 3,811,529 | 7.6 |
| Savannah River National Laboratory ^c | 154,281 | 176,379 | 176,093 | na | na | na |

NA = not available; na = not applicable.

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

^a Prior to the FY 2021 collection, the National Center for Science and Engineering Statistics discovered that the Green Bank Observatory had split from the National Radio Astronomy Observatory on 1 October 2016; both retained FFRDC status. For FYs 2017–20, R&D expenditures reported for the National Radio Astronomy Observatory included the expenditures for the Green Bank Observatory. The Green Bank Observatory began reporting separately on the FY 2021 survey.

^b The Judiciary Modernization Engineering Center was decertified as an FFRDC on 31 January 2021.

^c In FY 2021, Savannah River National Laboratory acquired a new nonprofit administrator: Battelle Savannah River Alliance, LLC. Prior to the FY 2021 collection, Savannah River National Laboratory was administered by an industrial firm administrator: Savannah River Nuclear Solutions, LLC.

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 2022 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); federal agency source; type of R&D (basic research, applied research, or experimental development); type of cost (salaries, software, equipment, subcontracts, other direct costs, and indirect costs); R&D personnel headcounts and full-time equivalents; and total operating budget. 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/surveys/ffrdc-research-development/2022>.

Notes

- 1 See table 1 in the [full set of data tables](#) for annual totals from FY 2001 to FY 2022.
- 2 See detailed R&D reporting for each FFRDC in the microdata files at https://www.nsf.gov/statistics/ffrdc/pub_data.cfm for publicly reported data for FFRDCs from FY 1979 to FY 2022.
- 3 See table 6 in the [full set of data tables](#) for FFRDC sponsoring agencies and locations. [The Master Government List of FFRDCs](#) also provides details on sponsoring agencies, administrator types, locations, general and historical notes.

Suggested Citation

Gibbons MT; National Center for Science and Engineering Statistics (NCSES). 2023. *Federally Funded R&D Centers Spent \$26.5 Billion on R&D in FY 2022*. NSF 23-348. Alexandria, VA: National Science Foundation. Available at <https://nces.nsf.gov/pubs/nsf23348/>.

Contact Us

Report Author

Michael T. Gibbons
Survey Manager
NCSES
Tel: (703) 292-4590
E-mail: mgibbons@nsf.gov

NCSES

National Center for Science and Engineering Statistics
Directorate for Social, Behavioral and Economic Sciences
National Science Foundation
2415 Eisenhower Avenue, Suite W14200
Alexandria, VA 22314
Tel: (703) 292-8780
FIRS: (800) 877-8339
TDD: (800) 281-8749
E-mail: ncsesweb@nsf.gov