National Center for Science and Engineering Statistics

InfoBrief

Universities Report 8.1% Growth in R&D Expenditures in FY 2024, Reaching Over $117 Billion

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Total higher education research and development (R&D) expenditures reached $117.7 billion in FY 2024, an increase of $8.9 billion from FY 2023 (table 1). This total was 8.1% greater than R&D spending by academic institutions in FY 2023. Since FY 2014, higher education R&D has grown at an average compound annual rate of 5.7% in current dollars and 3.0% in constant dollars (figure 1).[1] R&D expenditures funded by federal sources accounted for $5.0 billion of the total increase from FY 2023. Universities' internally funded R&D expenditures (institution funds) were $2.5 billion greater than in FY 2023, while R&D funded by state and local governments also increased in FY 2024 by $633 million. R&D expenditures funded by businesses increased by $131 million and those funded by nonprofit organizations increased by $16 million. R&D funded by all other sources increased by $530 million in FY 2024.

Table 1. Higher education R&D expenditures, by source of funds: FYs 2014–24

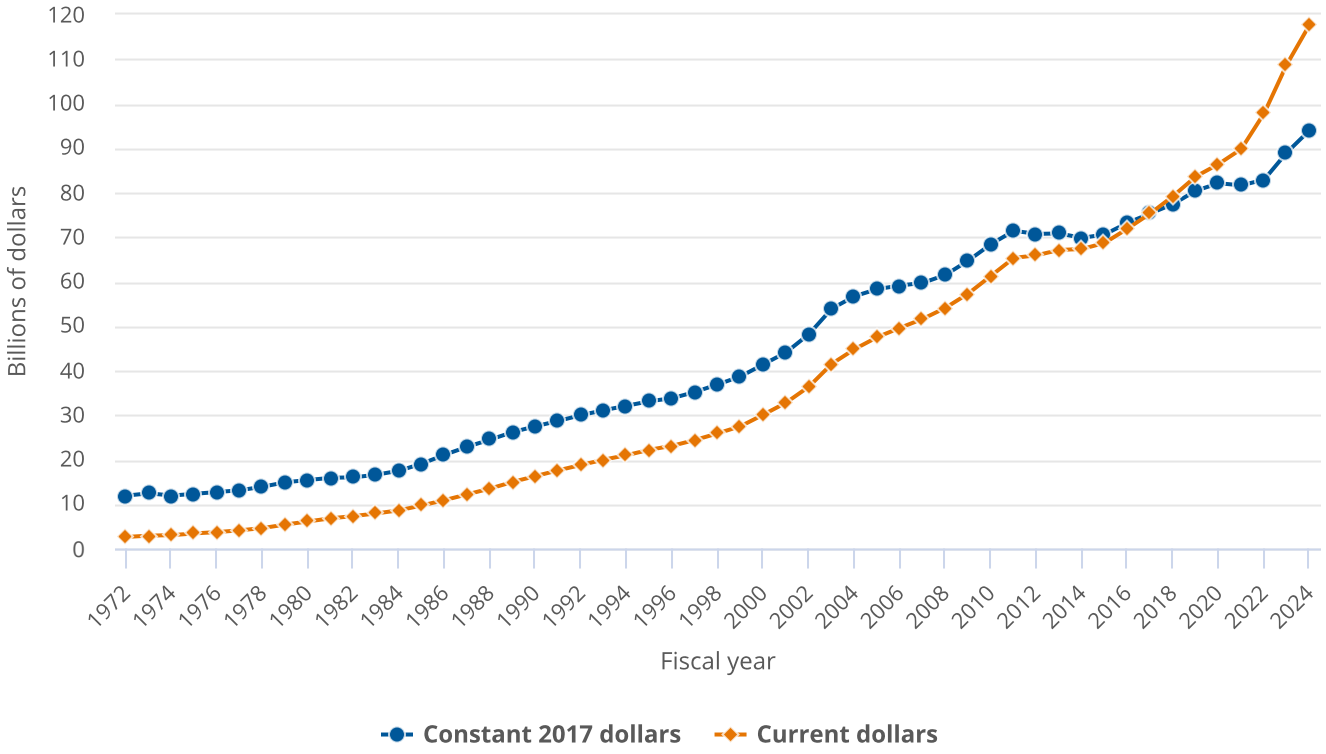
(Millions of current dollars)

Fiscal year	All R&D expenditures	Source of funds					
		Federal government	State and local government	Institution funds	Business	Nonprofit organizations	All other sources
2014	67,315	38,031	3,916	15,745	3,734	3,978	1,911
2015	68,665	37,911	3,864	16,609	4,009	4,235	2,037
2016	71,881	38,856	4,053	17,912	4,220	4,635	2,204
2017	75,294	40,319	4,186	18,887	4,440	5,159	2,303
2018	79,177	41,934	4,326	20,222	4,726	5,459	2,511
2019	83,647	44,538	4,520	21,115	5,066	5,705	2,702
2020	86,448	46,184	4,603	22,024	5,189	5,758	2,688
2021	89,846	49,196	4,752	22,480	5,123	5,607	2,689
2022	97,844	54,056	4,918	24,539	5,706	5,978	2,646
2023	108,858	59,683	5,451	27,685	6,230	6,683	3,125
2024	117,719	64,718	6,084	30,202	6,361	6,699	3,655

Note(s):
Because of rounding, detail may not add to total. This table includes all institutions surveyed in the fiscal years shown.

Source(s):
National Center for Science and Engineering Statistics, Higher Education Research and Development Survey.

Figure 1. Higher education R&D expenditures: FYs 1972–2024



Note(s):
Dollars adjusted for inflation (i.e., constant dollars) are based on the gross domestic product (GDP) implicit price deflator, currently in 2017 dollars, as published by the Bureau of Economic Analysis (BEA) under Section 1 Domestic Product and Income at https://apps.bea.gov/iTable/?isuri=1&reqid=19&step=4&categories=flatfiles&nipa_table_list=1, accessed on 4 August 2025. Note that GDP deflators are calculated on an economy-wide scale and do not explicitly focus on R&D.

Source(s):
National Center for Science and Engineering Statistics, Higher Education Research and Development Survey.

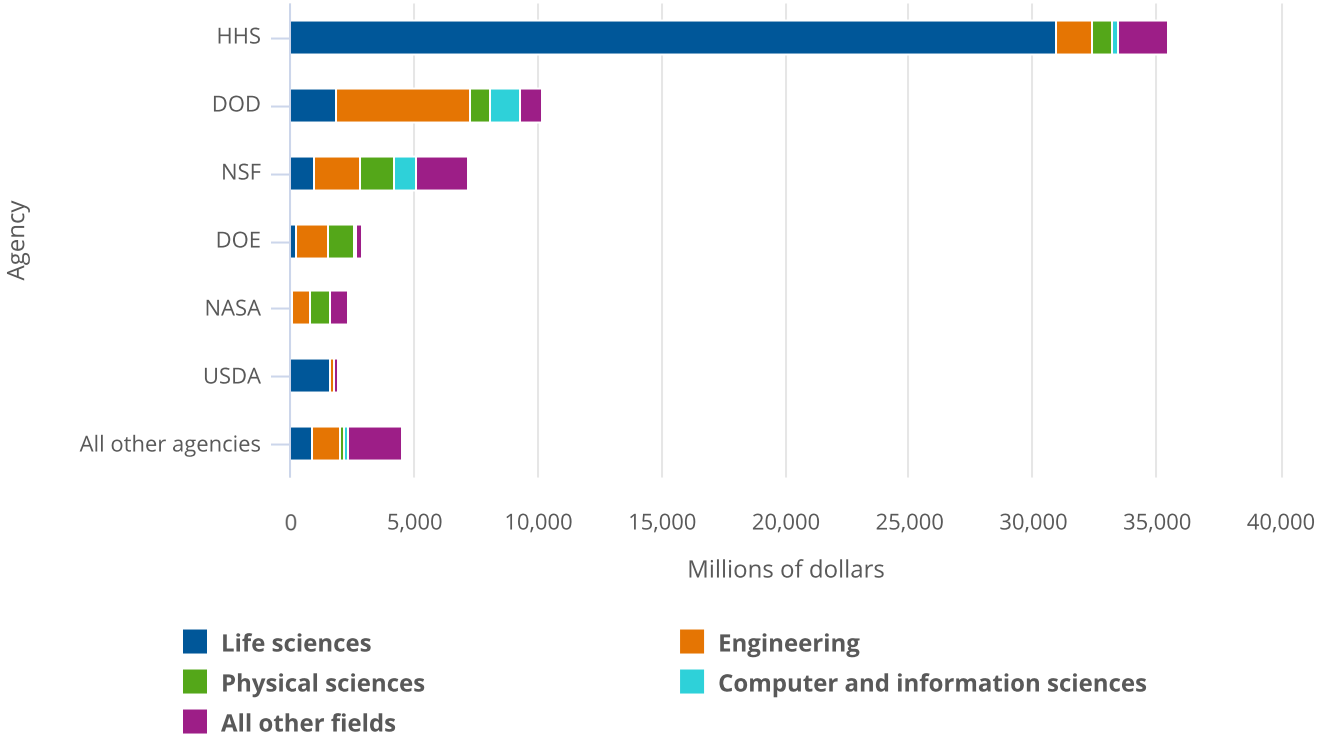
The data discussed in this report are from the Higher Education Research and Development (HERD) Survey, sponsored by the National Center for Science and Engineering Statistics (NCSES) within the U.S. National Science Foundation. For more information on the survey, see "Data Sources, Limitations, and Availability."

R&D Expenditures, by Federal Funding Sources

Federally funded R&D at universities surpassed $64 billion in FY 2024, which accounted for 55% of total R&D (table 2). The largest federal source of R&D expenditures for higher education institutions was the Department of Health and Human Services (HHS)—which includes the National Institutes of Health—at $35.5 billion, up $2.4 billion from FY 2023. HHS accounted for 55% of FY 2024 federally funded R&D and 48% of the overall FY 2024 increase in federally funded R&D. HHS funds supported $30.9 billion in life sciences R&D, which notably includes biological and biomedical sciences and health sciences (figure 2).[2] HHS funds also supported $1.5 billion in engineering R&D expenditures. The Department of Defense (DOD) was the only agency other than HHS that supported at least $1 billion more in higher education R&D in FY 2024 than in FY 2023, reaching $10.2 billion in FY 2024. The largest share of DOD funds (54%) supported engineering R&D ($5.5 billion)

followed by life sciences ($1.9 billion, 18% of total), and computer and information sciences R&D ($1.2 billion, 11% of total). The National Science Foundation (NSF) funded $7.2 billion in higher education R&D in FY 2024 with $1.9 billion supporting engineering R&D and $1.3 billion supporting physical sciences R&D. Total higher education R&D funded by NSF was $474 million greater than in FY 2023.

Figure 2. Federally financed higher education R&D expenditures, by agency and field: FY 2024



DOD = Department of Defense; DOE = Department of Energy; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; USDA = Department of Agriculture.

Note(s):
All other agencies includes all other agencies reported. All other fields includes social sciences; psychology; mathematics and statistics; geosciences, atmospheric sciences, and ocean sciences; sciences not elsewhere classified; and non-science and engineering fields.

Source(s):
National Center for Science and Engineering Statistics, Higher Education Research and Development Survey, FY 2024.

Department of Energy (DOE) ($2.9 billion total, $270 million increase) funds primarily supported R&D in engineering ($1.3 billion, 44% of total) and physical sciences ($1.1 billion, 36% of total). The National Aeronautics and Space Administration (NASA) ($2.4 billion total, $73 million increase) and the Department of Agriculture (USDA) ($2.0 billion total, $275 million increase) were the only other agencies where funded higher education R&D expenditures reached or exceeded $2 billion in FY 2024. NASA funds primarily supported physical sciences ($795 million, 34% of total) and engineering ($742 million, 31% of total) R&D, while USDA funds in FY 2024 mainly supported life sciences ($1.6 billion, 82% of total). R&D expenditures funded by all other federal sources totaled $4.5 billion in FY 2024, an increase of 10% from FY 2023 (table 2).

Table 2. Federally financed higher education R&D expenditures, by federal agency: FYs 2014–24

(Millions of current dollars)

Source of funds	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	% change 2023–24
All higher education R&D expenditures	67,161	68,521	71,737	75,150	79,027	83,490	86,309	89,706	97,677	108,697	117,554	8.1
All federally financed higher education R&D expenditures	37,961	37,846	38,788	40,248	41,860	44,460	46,109	49,121	53,975	59,610	64,640	8.4
DOD	4,927	5,090	5,313	5,634	5,892	6,652	7,078	7,363	7,979	9,046	10,174	12.5
DOE	1,805	1,710	1,772	1,821	1,819	1,940	2,038	2,218	2,488	2,671	2,941	10.1
HHS	20,298	19,994	20,663	21,627	22,837	24,407	25,365	27,521	30,273	33,104	35,500	7.2
NASA	1,329	1,418	1,491	1,406	1,516	1,644	1,758	1,768	2,045	2,296	2,369	3.2
NSF	5,127	5,119	5,114	5,206	5,271	5,333	5,414	5,408	6,037	6,700	7,174	7.1
USDA	1,062	1,119	1,209	1,223	1,186	1,224	1,250	1,304	1,513	1,701	1,976	16.2
Other	3,414	3,397	3,226	3,330	3,339	3,260	3,206	3,538	3,641	4,093	4,506	10.1

DOD = Department of Defense; DOE = Department of Energy; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; USDA = Department of Agriculture.

Note(s):
Because of rounding, detail may not add to total. Institutions reporting less than $1 million in total R&D expenditures completed a shorter version of the survey questionnaire and those totals are not reflected here. R&D expenditures from institutions reporting less than $1 million in R&D in FY 2024 were $164 million. Total federally funded R&D for these institutions in FY 2024 was $78 million.

Source(s):
National Center for Science and Engineering Statistics, Higher Education Research and Development Survey.

R&D Expenditures, by Field

In FY 2024, R&D expenditures in science fields increased by 7.6% ($6.4 billion), reaching $90.7 billion, and engineering fields increased by 10% ($1.8 billion), reaching $19.3 billion (table 3). R&D expenditures in non-science and engineering (non-S&E) fields ($7.6 billion) increased by 9.7% ($671 million). R&D expenditures in two life sciences subfields, health sciences ($38.5 billion, a $2.8 billion increase) and biological and biomedical sciences ($20.8 billion, a $1.3 billion increase), showed the largest dollar increases from FY 2023, accounting for 46% of the total university R&D growth in FY 2024. Combined, these two fields also accounted for 50% of total higher education R&D.

Table 3. Higher education R&D expenditures, by FY 2023 total, source of funds, and R&D field: FY 2024

(Millions of dollars)

Field	Total 2023 R&D expenditures	Total 2024 R&D expenditures	% change FYs 2023–24	Source of funds, 2024					
				Federal government	State and local government	Institution funds	Business	Nonprofit organizations	All other sources
All R&D fields	108,697	117,554	8.1	64,640	6,076	30,151	6,356	6,686	3,646
Science	84,322	90,714	7.6	50,524	4,485	22,474	4,905	5,495	2,831
Computer and information sciences	3,615	3,956	9.4	2,597	96	857	188	110	108
Geosciences, atmospheric sciences, and ocean sciences	4,036	4,407	9.2	2,904	297	842	98	170	97
Atmospheric science and meteorology	724	737	1.9	587	26	94	8	12	10

Table 3. Higher education R&D expenditures, by FY 2023 total, source of funds, and R&D field: FY 2024

(Millions of dollars)

Field	Total 2023 R&D expenditures	Total 2024 R&D expenditures	% change FYs 2023–24	Source of funds, 2024					
				Federal government	State and local government	Institution funds	Business	Nonprofit organizations	All other sources
Geological and earth sciences	1,489	1,688	13.3	1,028	96	400	53	62	49
Ocean sciences and marine sciences	1,367	1,497	9.5	955	145	267	25	75	30
Geosciences, atmospheric sciences, and ocean sciences nec	456	485	6.3	334	30	81	12	21	7
Life sciences	62,198	66,821	7.4	36,574	3,495	16,149	4,277	4,129	2,197
Agricultural sciences	4,286	4,803	12.1	1,708	1,144	1,474	159	160	157
Biological and biomedical sciences	19,519	20,770	6.4	12,589	639	4,817	893	1,321	511
Health sciences	35,724	38,513	7.8	20,969	1,421	9,041	3,145	2,508	1,429
Natural resources and conservation	1,079	1,127	4.4	503	190	324	18	54	37
Life sciences nec	1,589	1,609	1.2	804	102	493	61	86	62
Mathematics and statistics	1,061	1,165	9.8	727	34	326	12	55	9
Physical sciences	6,947	7,456	7.3	4,900	153	1,713	229	293	170
Astronomy and astrophysics	967	1,079	11.6	723	11	201	3	59	83
Chemistry	2,301	2,518	9.4	1,525	67	673	96	114	44
Materials science	321	349	8.8	229	5	87	17	6	5
Physics	2,968	3,107	4.7	2,208	48	654	68	100	29
Physical sciences nec	391	403	3.2	215	22	97	45	15	9
Psychology	1,642	1,731	5.4	1,027	69	490	11	108	26
Social sciences	3,623	3,910	7.9	1,295	257	1,544	55	579	180
Anthropology	152	178	17.0	56	5	97	1	12	7
Economics	724	780	7.8	213	67	298	14	146	43
Political science and government	557	601	7.9	124	24	286	5	119	44
Sociology, demography, and population studies	735	769	4.6	337	46	254	16	99	16
Social sciences nec	1,455	1,581	8.6	565	115	609	19	203	70
Sciences nec	1,200	1,268	5.7	499	84	554	35	51	46
Engineering	17,477	19,271	10.3	12,185	1,040	3,764	1,265	500	516
Aerospace, aeronautical, and astronautical engineering	1,914	2,054	7.3	1,580	51	188	206	6	23
Bioengineering and biomedical engineering	1,894	2,082	9.9	1,325	74	438	71	139	34
Chemical engineering	1,247	1,409	13.0	829	55	317	116	58	34
Civil engineering	1,901	2,097	10.3	1,023	363	523	85	57	46

Table 3. Higher education R&D expenditures, by FY 2023 total, source of funds, and R&D field: FY 2024

(Millions of dollars)

Field	Total 2023 R&D expenditures	Total 2024 R&D expenditures	% change FYs 2023–24	Source of funds, 2024					
				Federal government	State and local government	Institution funds	Business	Nonprofit organizations	All other sources
Electrical, electronic, and communications engineering	3,838	4,416	15.1	3,231	100	689	186	100	109
Industrial and manufacturing engineering	707	748	5.7	524	42	133	29	11	9
Mechanical engineering	2,325	2,573	10.6	1,754	92	456	188	38	45
Metallurgical and materials engineering	1,039	1,141	9.8	748	42	205	82	28	37
Engineering nec	2,611	2,752	5.4	1,171	220	815	304	64	178
Non-S&E	6,898	7,569	9.7	1,931	551	3,913	185	690	299
Business management and business administration	1,219	1,349	10.7	121	62	986	40	54	85
Communication and communications technologies	253	263	4.0	65	13	133	6	34	11
Education	2,043	2,218	8.6	975	222	669	57	255	40
Humanities	845	926	9.6	70	24	654	20	117	41
Law	431	444	2.9	43	42	247	6	72	32
Social work	417	461	10.5	224	59	129	5	38	6
Visual and performing arts	284	303	6.6	26	16	234	3	16	9
Non-S&E nec	1,405	1,605	14.2	406	112	861	47	103	75

nec = not elsewhere classified; S&E = science and engineering.

Note(s):
This table includes only institutions reporting $1 million or more in total R&D expenditures in FY 2023. Institutions reporting less than $1 million in total R&D expenditures in FY 2023 completed a shorter version of the survey form in FY 2024, and that form did not collect R&D expenditures by source and detailed field. Total expenditures from institutions reporting less than $1 million in R&D in FY 2024 was $164 million.

Source(s):
National Center for Science and Engineering Statistics, Higher Education Research and Development Survey.

While the federal government funded 55% of all FY 2024 higher education R&D expenditures, federally funded expenditures in several fields accounted for more than 70% of their respective totals: atmospheric science and meteorology (80%); aerospace, aeronautical, and astronautical engineering (77%); electrical, electronic, and communications engineering (73%); physics (71%); and industrial and manufacturing engineering (70%). State and local governments funded 5.2% of total academic R&D, but these sources supported higher percentages of the respective total in five fields: agricultural sciences (24%), civil engineering (17%), natural resources and conservation (17%), social work (13%), and education (10%). The fields with the highest shares of institutionally funded R&D were anthropology (54%), political science and government (48%), and the non-S&E fields as a whole (52%). Within the non-S&E fields, only two were supported by less than 50% of institutional funds: education (30%) and social work (28%). Nonprofit organizations and businesses provided similar levels of R&D

support in FY 2024 at 5.7% and 5.4%, respectively. However, nonprofits funded at least 16% of R&D in three fields: political science and government (20%), economics (19%), and law (16%), while businesses funded 10% or more in three fields: engineering, not elsewhere classified (11%); physical sciences, not elsewhere classified (11%); and aerospace, aeronautical, and astronautical engineering (10%).[3]

Top University Research Performers

The top 30 institutions in terms of R&D expenditures accounted for 42% of the total spent on R&D within the higher education sector in FY 2024, which is consistent with fiscal years 2022 and 2023 (table 4). Thirty-seven institutions reported at least $1 billion in R&D expenditures in FY 2024, compared with 33 institutions in FY 2023 and 29 in FY 2022.[4] Sixteen of the top 30 institutions were public, accounting for $26.1 billion in total R&D expenditures; 14 were private, accounting for $23.4 billion.[5] Almost all of the institutions (28 of the 30) had medical schools.[6] The same institutions were ranked in the top 30 in FY 2023 and FY 2024, although several institutions changed positions on the list.

Table 4. Thirty institutions reporting the largest R&D expenditures, ranked by FY 2024 expenditures: FYs 2022–24

(Millions of current dollars)

Institution	Rank	2022	2023	2024	% change 2023–24
All institutions	-	97,677	108,697	117,554	8.1
Leading 30 institutions	-	41,235	45,963	49,573	7.9
Johns Hopkins U.[a]	1	3,420	3,802	4,129	8.6
U. Pennsylvania	2	1,791	1,954	2,168	10.9
U. California, San Francisco	3	1,806	2,047	2,128	4.0
U. Michigan, Ann Arbor	4	1,771	1,926	2,111	9.6
U. Wisconsin-Madison	5	1,524	1,732	1,933	11.6
U. California, Los Angeles	6	1,536	1,722	1,896	10.1
U. California, San Diego	7	1,533	1,705	1,881	10.3
U. Washington, Seattle	8	1,560	1,734	1,691	-2.5
Stanford U.	9	1,385	1,538	1,642	6.8
Cornell U.	10	1,300	1,452	1,614	11.1
U. North Carolina, Chapel Hill	11	1,361	1,550	1,599	3.2
Ohio State U.	12	1,363	1,449	1,582	9.1
Duke U.	13	1,391	1,508	1,581	4.8
U. Maryland	14	1,229	1,385	1,540	11.1
Georgia Institute of Technology	15	1,231	1,405	1,529	8.8
Yale U.	16	1,191	1,327	1,520	14.5
U. Pittsburgh, Pittsburgh	17	1,252	1,398	1,505	7.6
New York U.	18	1,276	1,457	1,501	3.0
Harvard U.	19	1,308	1,435	1,495	4.1
Columbia U. in the City of New York	20	1,231	1,342	1,450	8.0
U. Minnesota, Twin Cities	21	1,202	1,320	1,410	6.8
Texas A&M U., College Station and Health Science Center	22	1,153	1,278	1,394	9.1
U. Texas M. D. Anderson Cancer Center	23	1,183	1,255	1,363	8.6
Vanderbilt U. and Vanderbilt U. Medical Center	24	1,086	1,253	1,328	6.0
Pennsylvania State U., University Park and Hershey Medical Center	25	1,020	1,207	1,303	8.0
U. Florida	26	1,086	1,250	1,272	1.8
U. Southern California	27	1,040	1,155	1,264	9.5
Northwestern U.	28	1,001	1,114	1,258	12.9
Emory U.	29	958	1,094	1,247	13.9
Washington U., Saint Louis	30	1,047	1,169	1,243	6.4

[a] Johns Hopkins University includes the Applied Physics Laboratory, with $2,550 million in total R&D expenditures in FY 2024.

Note(s):
Because of rounding, detail may not add to total. Rankings are based on unrounded totals. This table reflects the leading 30 institutions for FY 2024; the institutions listed may not be in the top 30 of prior fiscal years.

Source(s):
National Center for Science and Engineering Statistics, Higher Education Research and Development Survey.

Data Sources, Limitations, and Availability

The FY 2024 higher education R&D expenditures data were collected from a census of 925 universities and colleges that grant a bachelor's degree or higher and expended at least $150,000 in R&D in FY 2023. To reduce respondent burden, the HERD Survey requests abbreviated data (short form) from institutions reporting less than $1 million in R&D expenditures during the previous fiscal year (FY 2023). Except for the totals reported in table 1 and figure 1, all other totals shown in this report exclude expenditures from the 244 institutions that completed the short form version of the survey. The institutions completing the short form survey accounted for $164 million (0.14%) of total higher education R&D expenditures in FY 2024.

The fiscal year referred to throughout this report is the academic fiscal year. For most academic institutions, FY 2024 represents 1 July 2023 through 30 June 2024.

The amounts reported include all funds expended for activities specifically organized to produce research outcomes and either sponsored by an outside organization or separately accounted-for using institution funds. R&D expenditures at university-administered federally funded research and development centers (FFRDCs) are collected in a separate NCSES survey, the FFRDC Research and Development Survey.

The full set of data tables and technical information from this survey are available at https://ncses.nsf.gov/surveys/higher-education-research-development/2024.

NCSES has reviewed this product for unauthorized disclosure of confidential information and approved its release (NCSES-DRN25-060).

Notes

1 Dollars adjusted for inflation (i.e., constant dollars) are based on the gross domestic product (GDP) implicit price deflator, currently in 2017 dollars, as published by the Bureau of Economic Analysis (BEA) under Section 1 Domestic Product and Income at https://apps.bea.gov/iTable/?isuri=1&reqid=19&step=4&categories=flatfiles&nipa_table_list=1, accessed on 4 August 2025. Note that GDP deflators are calculated on an economy-wide scale and do not explicitly focus on R&D.

2 See table 3 in this InfoBrief for the full breakdown of all R&D fields and subfields.

3 Engineering fields, not elsewhere classified could include agricultural engineering, engineering design, engineering mechanics, engineering physics, engineering science, forest engineering, nanotechnology, naval architecture and marine engineering, nuclear engineering, ocean engineering, petroleum engineering, and other engineering fields that cannot be classified using the fields provided on the HERD questionnaire. Physical science fields, not elsewhere classified includes other physical science fields that cannot be classified using the fields provided on the HERD questionnaire.

4 For more details on institutions ranked by total R&D expenditures, see tables 4, 6, and 13–15 in the survey's FY 2024 detailed data tables.

5 Additional detailed data on institutional control of colleges and universities is available in the NCSES Table Builder tool, using the dimension "Institution Characteristics/Public or Private." See the article How to Build a Table for instructions on creating custom tables within this tool.

6 Additional detailed data on medical school R&D expenditures are available in the NCSES Table Builder tool, using the measure "For Medical School R&D." See the article How to Build a Table for instructions on creating custom tables within this tool.

Suggested Citation

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