

# 2013 ACADEMIC SPENDING TRENDS

National Science Foundation data show flat **SPENDING FOR HIGHER EDUCATION RESEARCH** institutions in recent years

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**WORRIES ABOUT** academic research funding fuel angst in university scientists all over the U.S. Data released annually by the National Science Foundation on academic spending trends give researchers a chance to explore how their departments

compare with the larger R&D community. In addition, these numbers can influence recruitment of faculty and graduate students.

According to NSF's most recent report, academic spending was fairly stable from

2012 to 2013. Overall, academic spending in 2013 was \$63.4 billion, up 58% from \$40.1 billion a decade earlier. That increase is smaller when adjusted for inflation—the 2013 figures amount to \$51.5 billion in 2003 dollars, up just 28% in the past decade—but it still represents an upward trend. (The accompanying tables and graphs show spending in current dollars, except where noted.)

The life sciences remained the prevailing force in academic science and technology spending. That discipline consumed 59% of the overall R&D budget in both 2003 and 2013, the NSF data show. Engineering overall had the biggest increase as a share of spending, up 79% over the past decade. Chemistry saw a small de-

U.S. academic science and engineering R&D spending:

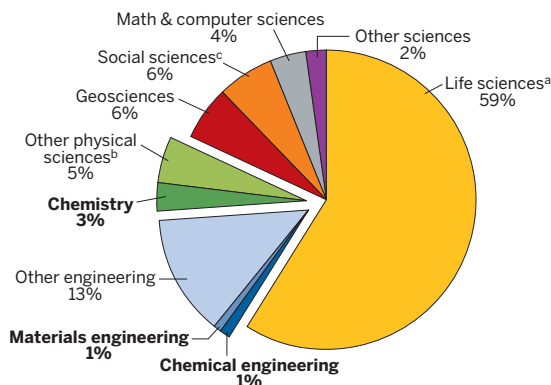
**\$63.4 billion**

Chemistry R&D spending:

**\$1.7 billion**

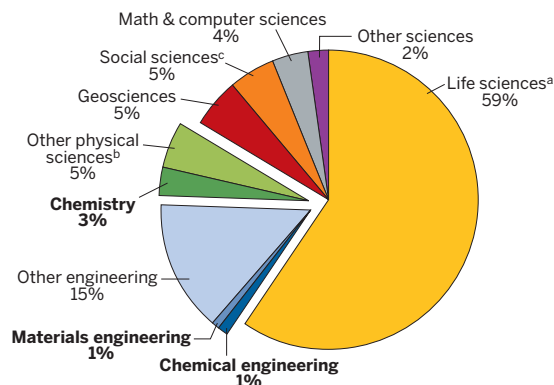
**& INTERACTIVE ONLINE**

Compare the top chemistry departments head-to-head in our interactive graphic of the top 100 chemistry spenders, and view a table of the top 25 chemical engineering spenders at <http://cenm.ag/13rd>.



Academic R&D spending, FY 2003 = \$40.1 billion

**SPENDING BY FIELD**  
The share of total funding for various disciplines remained relatively stable over the past decade.



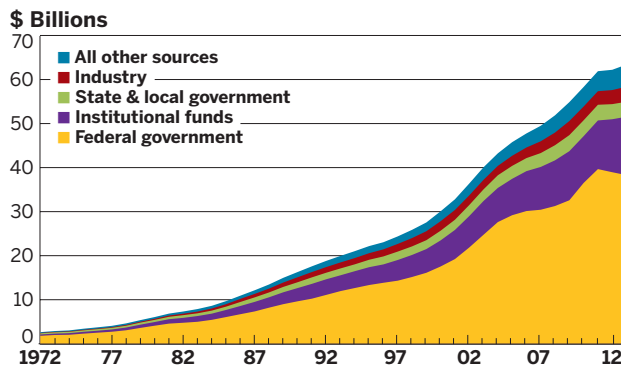
Academic R&D spending, FY 2013 = \$63.4 billion

**NOTE:** Institutional fiscal years. Spending figures do not account for inflation. **a** Includes agricultural, biological, medical, and other life sciences. **b** Includes astronomy, physics, and other physical sciences. **c** Includes psychology. **SOURCE:** National Science Foundation, WebCASPAR database, 2013 data

## FUNDING SOURCES

Federal funding has declined, and institutions have contributed more to academic R&D.

**NOTE:** Institutional fiscal years beginning with 1972, the first year for which data are available. **SOURCE:** National Science Foundation, WebCASPAR database, 2013 data



## BIG MOVERS

Emory University moved up **24** places in chemistry spending rankings

U at Buffalo, SUNY, moved up **43** places in chemical engineering spending rankings

## SCHOOL SPENDING ON CHEMICAL R&D

This table ranks top chemistry spenders and breaks down funding sources

RANK		SPENDING, \$ THOUSANDS			SHARE OF TOTAL EXPENDITURES IN 2013, % <sup>a</sup>				ANNUAL CHANGE		
2013	2012	INSTITUTION	2003	2012	2013	FEDERAL GOVT.	STATE/ LOCAL GOVT.	INDUSTRY	INSTITUTION	2012-13	2003-13
1	1	California Inst. of Technology	\$18,099	\$56,563	\$46,430	87.4%	0.1%	4.3%	1.2%	-17.9%	156.5%
2	3	Georgia Tech	9,652	34,971	37,960	69.7	0.5	6.9	21.6	8.5	293.3
3	5	Harvard U	19,456	28,990	35,641	66.8	0.0	2.4	21.9	22.9	83.2
4	4	Northwestern U	16,108	33,822	35,547	66.4	0.0	0.0	21.3	5.1	120.7
5	8	U of California, San Diego	17,530	27,399	31,353	85.2	1.5	1.5	2.2	14.4	78.9
6	6	U of Illinois, Urbana-Champaign	20,949	28,730	29,131	73.3	0.0	3.5	17.5	1.4	39.1
7	13	U of California, Berkeley	24,907	22,243	25,954	69.1	0.5	9.5	7.3	16.7	4.2
8	2	Rutgers U	15,552	36,452	25,758	85.3	0.9	4.0	7.7	-29.3	65.6
9	24	Johns Hopkins U <sup>b</sup>	11,330	19,393	24,947	96.1	0.0	0.1	3.3	28.6	120.2
10	7	U of Texas, Austin	23,382	27,629	24,649	52.3	5.8	3.5	24.6	-10.8	5.4
11	19	U of North Carolina, Chapel Hill	16,045	20,378	23,595	79.2	0.0	1.8	15.5	15.8	47.1
12	11	U of Michigan	15,191	23,076	23,168	67.0	0.0	2.3	27.7	0.4	52.5
13	27	U of Wisconsin, Madison	15,546	18,944	22,968	51.5	5.7	7.6	29.1	21.2	47.7
14	26	U of California, Irvine	10,856	19,216	22,450	69.7	0.0	3.0	22.3	16.8	106.8
15	12	Texas A&M U	19,703	22,588	22,378	37.1	0.5	2.0	30.4	-0.9	13.6
16	14	U of Notre Dame	10,657	22,056	21,896	64.2	0.3	1.7	28.2	-0.7	105.5
17	31	Indiana U	14,701	17,327	21,762	49.6	0.0	9.1	36.0	25.6	48.0
18	20	Cornell U	20,804	20,328	20,950	70.5	0.0	0.9	22.3	3.1	0.7
19	18	U of Colorado	15,164	20,523	20,668	72.2	0.0	1.6	13.3	0.7	36.3
20	16	Stanford U	18,097	21,045	20,633	80.7	0.0	7.4	9.8	-2.0	14.0
21	15	U of Akron	11,260	21,380	20,276	15.0	0.8	8.1	45.2	-5.2	80.1
22	9	Massachusetts Inst. of Technology	20,184	24,698	19,297	70.0	0.1	14.9	10.8	-21.9	-4.4
23	23	U of Massachusetts, Amherst	15,688	19,993	19,234	70.9	0.0	7.6	20.8	-3.8	22.6
24	48	Emory U	10,667	12,850	18,685	53.4	0.0	1.2	45.2	45.4	75.2
25	25	U of California, Los Angeles	19,607	19,286	18,486	66.7	0.5	13.5	8.7	-4.1	-5.7
26	17	Pennsylvania State U	18,214	21,032	18,290	57.6	0.0	5.0	31.7	-13.0	0.4
27	10	U of Washington, Seattle	16,947	23,412	17,404	89.9	1.7	0.4	4.6	-25.7	2.7
28	38	U of Minnesota	9,569	14,315	17,378	72.8	0.2	10.2	15.8	21.4	81.6
29	22	Purdue U	13,268	20,059	17,286	66.3	0.2	10.3	18.2	-13.8	30.3
30	37	Stony Brook U, SUNY	9,007	14,892	17,273	48.4	1.2	3.4	44.9	16.0	91.8
31	21	U of Arizona	10,874	20,321	17,255	66.7	2.2	1.0	23.4	-15.1	58.7
32	29	U of Chicago	8,802	18,310	17,180	78.8	0.0	2.8	10.7	-6.2	95.2
33	35	U of Pittsburgh	9,630	15,929	17,116	55.3	0.0	0.8	42.6	7.5	77.7
34	30	Princeton U	11,278	17,811	16,829	52.2	0.0	7.8	36.4	-5.5	49.2
35	42	Rice U	9,294	13,824	16,661	54.5	10.3	9.0	15.9	20.5	79.3
36	32	Arizona State U, Tempe	10,162	16,316	16,048	64.0	3.9	1.4	26.8	-1.6	57.9
37	47	Yale U	8,062	12,973	16,020	63.4	0.0	1.9	26.3	23.5	98.7
38	39	U of California, Davis	7,526	14,220	13,923	65.8	0.0	3.0	17.8	-2.1	85.0
39	45	Florida State U	13,321	13,248	13,871	70.3	0.0	0.8	28.1	4.7	4.1
40	33	U of Southern California	8,890	16,012	13,707	50.4	0.0	14.6	19.6	-14.4	54.2
41	49	U of Kansas	3,856	12,013	13,444	79.2	1.0	3.6	11.7	11.9	248.7
42	61	Michigan State U	13,230	9,763	13,213	71.0	0.0	3.4	24.3	35.3	-0.1
43	43	Ohio State U	15,512	13,739	12,816	73.7	0.1	0.4	21.5	-6.7	-17.4
44	34	Vanderbilt U	4,546	15,959	12,308	86.4	0.0	1.0	11.4	-22.9	170.7
45	52	U of Florida	11,594	11,966	11,987	58.6	0.4	3.0	32.0	0.2	3.4
46	40	U of California, San Francisco	28,798	14,192	11,858	75.0	0.0	3.2	12.9	-16.4	-58.8
47	44	U of Pennsylvania	11,165	13,615	11,780	92.2	0.0	0.9	4.5	-13.5	5.5
48	51	Columbia U	7,746	11,970	11,681	76.8	0.0	1.1	9.3	-2.4	50.8
49	55	Boston U	3,827	10,599	11,600	68.9	0.0	0.7	22.8	9.4	203.1
50	28	U of Utah	12,247	18,863	11,570	83.8	0.4	0.1	14.5	-38.7	-5.5
<b>Total, listed institutions</b>			<b>\$688,500</b>	<b>\$1,005,233</b>	<b>\$1,002,314</b>	<b>68.2%</b>	<b>0.8%</b>	<b>4.2%</b>	<b>19.8%</b>	<b>-0.3%</b>	<b>45.6%</b>
<b>TOTAL, ALL INSTITUTIONS</b>			<b>\$1,225,546</b>	<b>\$1,750,134</b>	<b>\$1,706,470</b>	<b>66.6%</b>	<b>2.0%</b>	<b>4.0%</b>	<b>21.6%</b>	<b>-2.5%</b>	<b>39.2%</b>

**NOTE:** Institutional fiscal years. **a** Figures might not sum to 100% because other funding sources, such as nonprofit organizations, are not listed. **b** Includes funding for the Applied Physics Laboratory.

**SOURCE:** National Science Foundation, WebCASPAr database

## TOP 25 UNIVERSITIES IN 2013 R&amp;D SPENDING

Many top-spending universities don't pour a lot of money into chemistry

RANK		SPENDING, \$ MILLIONS								
OVERALL	CHEMISTRY	INSTITUTION	CHEMISTRY	LIFE SCIENCES <sup>a</sup>	ENGINEERING	PHYSICAL SCIENCES <sup>b</sup> (INCL. CHEM.)	GEOSCIENCES	MATH & COMPUTER SCIENCES	OTHER SCIENCES	OVERALL
1	9	Johns Hopkins U <sup>c</sup>	\$25	\$871	\$879	\$180	\$39	\$149	\$33	\$2,150
2	12	U of Michigan	23	788	250	50	18	22	183	1,310
3	27	U of Washington, Seattle	17	785	122	45	114	22	23	1,112
4	5	U of California, San Diego	31	610	126	67	165	43	56	1,067
5	46	U of California, San Francisco	12	1031	0	12	0	0	0	1,043
6	13	U of Wisconsin, Madison	23	641	139	81	49	29	58	998
7	75	Duke U	7	811	72	20	20	17	46	987
8	11	U of North Carolina, Chapel Hill	24	701	4	34	35	29	140	942
9	25	U of California, Los Angeles	18	668	76	66	22	29	73	934
10	3	Harvard U	36	538	58	77	32	12	194	911
11	20	Stanford U	21	570	131	101	29	35	33	901
12	28	U of Minnesota	17	587	102	47	31	29	59	855
13	33	U of Pittsburgh	17	730	37	30	10	11	29	847
14	48	Columbia U	12	590	63	42	115	21	14	846
15	18	Cornell U	21	536	105	105	22	27	46	841
16	22	Massachusetts Inst. of Technology	19	119	420	107	51	77	59	834
17	26	Pennsylvania State U	18	273	321	57	53	69	58	830
18	15	Texas A&M U	22	299	279	46	128	22	22	796
19	47	U of Pennsylvania	12	647	48	28	4	22	42	790
20	37	Yale U	16	670	33	41	6	17	21	788
21	19	U of Colorado	21	426	101	93	95	15	44	774
22	43	Ohio State U	13	455	156	32	11	39	52	743
23	2	Georgia Tech	38	21	503	57	16	107	22	726
24	6	U of Illinois, Urbana-Champaign	29	217	165	60	8	229	41	722
25	470	U of Texas MD Anderson Cancer Center	0	659	0	15	0	16	28	718
<b>Total, listed institutions</b>			<b>\$493</b>	<b>\$14,240</b>	<b>\$4,191</b>	<b>\$1,493</b>	<b>\$1,074</b>	<b>\$1,090</b>	<b>\$1,377</b>	<b>\$23,465</b>
<b>TOTAL, ALL INSTITUTIONS</b>			<b>\$1,706</b>	<b>\$37,585</b>	<b>\$10,729</b>	<b>\$4,646</b>	<b>\$3,199</b>	<b>\$2,739</b>	<b>\$4,496</b>	<b>\$67,891</b>

**NOTE:** Institutional fiscal years. Total may not sum because of rounding. **a** Includes agricultural, biological, medical, and other life sciences. **b** Includes astronomy, chemistry, physics, and other physical sciences. **c** Includes funding for the Applied Physics Laboratory.

**SOURCE:** National Science Foundation, WebCASPASR database, 2013 data

cline as a share of the overall budget, from 3.1% to 2.7%.

For universities, the federal government remained by far the dominant player in research support. But the amount of federal spending peaked at \$39.7 billion in 2011 and then began a slow decline. Industry support has risen slowly, but institutions themselves also picked up some of the slack. Their spending on research climbed to \$13.3 billion in 2013, almost double the amount they provided a decade earlier.

The trends in chemistry department spending were also generally upward

from 2012 to 2013. California Institute of Technology, the top-funded chemistry department, spent \$46.4 million in 2013, with 87% of those funds from the federal government. That was down from Caltech's 2012 spending numbers, but it received more than double the overall money it spent in 2003.

The top-spending chemical engineering department, the University of Texas, Austin, shelled out almost the same as Caltech's largest-spending chemistry department, \$46.2 million in 2013. However, only 33% of that chemical engineering program's spending was supported by federal

dollars. An almost equal amount—37%—came from industry.

Only a handful of the highest-spending chemistry departments were in the country's top-spending research institutions for science and technology overall. The top research spender in 2013, Johns Hopkins University, had the ninth-ranked chemistry department in terms of spending. Other top 10 highest-spending chemistry departments in the top 25 for overall spending were the University of California, San Diego; Harvard University; Georgia Institute of Technology; and the University of Illinois, Urbana-Champaign. ■

## SCHOOL SPENDING ON CHEMICAL ENGINEERING R&D

This table ranks top chemical engineering spenders and breaks down funding sources

RANK		INSTITUTION	SPENDING, \$ THOUSANDS			SHARE OF TOTAL EXPENDITURES IN 2013, %				ANNUAL CHANGE	
2013	2012		2003	2012	2013	FEDERAL GOVT.	STATE/LOCAL GOVT.	INDUSTRY	INSTITUTION	2012-2013	2003-2013
1	3	U of Texas, Austin	\$9,351	\$36,078	\$46,191	33.1%	8.3%	36.5%	14.1%	28.0%	394.0%
2	5	Colleges of Nanoscale Science & Engineering, SUNY	na	28,000	39,440	4.6	26.2	55.0	13.4	40.9	nm
3	1	Georgia Tech	9,519	45,678	35,827	62.1	1.2	22.6	13.1	-21.6	276.4
4	2	Massachusetts Inst. of Technology	17,340	36,287	34,531	42.6	0.0	40.8	10.3	-4.8	99.1
5	6	North Carolina State U, Raleigh	16,839	25,359	26,078	39.4	25.4	10.1	25.1	2.8	54.9
6	49	U at Buffalo, SUNY	1,885	6,643	23,679	86.3	0.0	7.1	3.9	256.5	1156.2
7	7	Johns Hopkins U	8,300	18,522	19,724	94.7	0.1	0.5	3.4	6.5	137.6
8	8	U of Delaware	8,333	17,567	18,332	83.0	0.2	4.9	11.4	4.4	120.0
9	9	Texas A&M U	9,528	17,437	18,008	19.4	2.8	34.5	39.8	3.3	89.0
10	16	U of Minnesota	7,555	13,692	17,864	39.5	0.0	16.0	37.4	30.5	136.5
11	13	Stanford U	8,844	14,825	15,895	47.5	0.4	34.7	9.6	7.2	79.7
12	12	Purdue U	5,345	15,015	15,010	54.9	2.4	9.4	27.9	0.0	180.8
13	10	U of Massachusetts, Amherst	3,012	15,679	14,503	54.3	0.0	13.0	31.7	-7.5	381.5
14	18	U of Wisconsin, Madison	6,850	12,330	13,972	61.2	1.2	5.2	28.3	13.3	104.0
15	23	U of Notre Dame	2,328	10,617	13,898	50.3	0.0	0.5	44.7	30.9	497.0
16	11	U of Colorado	3,672	15,432	13,854	63.4	0.0	15.9	17.7	-10.2	277.3
17	17	U of Michigan	7,772	12,885	13,557	68.2	0.1	9.1	20.5	5.2	74.4
18	15	Pennsylvania State U	15,060	14,131	13,544	56.0	0.0	11.5	27.9	-4.2	-10.1
19	14	Northwestern U	4,932	14,154	13,472	67.7	0.0	0.0	13.8	-4.8	173.2
20	21	U of Akron	5,090	10,972	12,861	24.8	10.7	4.2	49.5	17.2	152.7
21	24	U of Tulsa	5,102	10,548	11,953	6.3	0.0	90.2	2.6	13.3	134.3
22	26	Ohio State U	6,962	9,720	11,918	49.1	10.7	10.8	28.3	22.6	71.2
23	20	U of California, Davis	5,310	11,521	11,673	66.1	0.2	6.1	16.1	1.3	119.8
24	37	U of California, Santa Barbara	5,843	7,741	11,121	61.9	0.0	24.2	2.4	43.7	90.3
25	19	Michigan State U	7,712	11,790	10,653	62.4	1.6	6.6	28.5	-9.6	38.1
<b>Total, listed institutions</b>			<b>\$182,484</b>	<b>\$432,623</b>	<b>\$477,558</b>	<b>49.0%</b>	<b>5.3%</b>	<b>22.3%</b>	<b>19.0%</b>	<b>10.4%</b>	<b>161.7%</b>
<b>TOTAL, ALL INSTITUTIONS</b>			<b>\$453,203</b>	<b>\$908,094</b>	<b>\$909,377</b>	<b>52.6%</b>	<b>5.1%</b>	<b>17.3%</b>	<b>19.7%</b>	<b>0.1%</b>	<b>100.7%</b>

**NOTE:** Institutional fiscal years. Figures may not sum to 100% because other funding sources, such as nonprofit organizations, are not listed. **na**=not available. **nm**=not meaningful.  
**SOURCE:** National Science Foundation, WebCASPAR database