

TABLE 55

## Higher education R&amp;D expenditures in engineering subfields, ranked by all FY 2019 engineering R&amp;D: FYs 2017–19 and by subfield for FY 2019

(Dollars in thousands)

Institution	Rank	2017	2018	2019									
				All engineering	Aerospace, aeronautical, and astronautical engineering	Bioengineering and biomedical engineering	Chemical engineering	Civil engineering	Electrical, electronic, and communications engineering	Industrial and manufacturing engineering	Mechanical engineering	Metallurgical and materials engineering	Engineering nec
All institutions	-	11,913,699	12,366,530	13,214,359	1,169,928	1,450,156	977,867	1,432,381	2,938,953	557,350	1,705,397	791,260	2,191,067
Johns Hopkins U. <sup>a</sup>	1	1,080,021	1,087,478	1,147,335	121,043	52,304	20,532	19,363	536,637	96,682	208,582	24,664	67,528
Georgia Institute of Technology	2	578,662	613,650	664,695	163,533	41,287	23,824	24,645	250,427	77,530	47,275	24,726	11,448
Massachusetts Institute of Technology	3	432,453	431,927	450,915	27,688	118,310	46,670	18,280	52,774	214	55,277	41,282	90,420
SUNY, Polytechnic Institute	4	305,576	255,033	350,793	0	0	0	33	0	0	59	0	350,701
Pennsylvania State U., University Park and Hershey Medical Center	5	312,341	325,002	350,391	28,351	19,077	22,879	15,740	100,673	30,168	90,336	43,167	0
Texas A&M U., College Station and Health Science Center	6	287,620	300,956	321,373	18,379	21,261	24,299	89,564	32,688	6,859	32,308	16,983	79,032
U. Michigan, Ann Arbor	7	286,094	299,072	291,887	17,083	20,938	12,829	25,780	81,768	6,285	41,651	11,904	73,649
Purdue U., West Lafayette	8	231,103	229,967	270,525	23,034	25,957	16,970	26,193	49,874	15,674	45,887	17,348	49,588
Virginia Polytechnic Institute and State U.	9	226,810	245,755	258,213	14,890	28,445	5,688	28,401	60,818	37,892	32,422	13,812	35,845
U. Texas, Austin	10	239,499	242,963	249,788	12,550	12,519	38,107	35,530	57,368	302	44,742	23,789	24,881
Utah State U.	11	111,780	140,407	202,345	179,979	1,100	0	11,307	4,927	0	3,555	0	1,477
U. Illinois, Urbana-Champaign	12	192,878	195,413	201,028	11,047	11,831	17,270	20,615	59,121	0	31,786	19,185	30,173
U. California, Berkeley	13	189,550	200,668	200,122	0	98	7,704	29,596	120,093	1	41	0	42,589

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Ohio State U.	14	178,028	183,646	177,518	417	4,871	13,300	7,052	28,694	8,117	72,671	25,495	16,901
North Carolina State U.	15	158,389	166,680	174,590	319	15,608	33,103	18,152	39,140	6,662	10,819	27,471	23,316
U. California, San Diego	16	125,033	150,596	172,919	0	53,954	0	0	80,480	0	15,857	0	22,628
U. Maryland <sup>b</sup>	17	na	na	158,814	18,843	19,607	6,387	33,608	16,227	0	19,790	14,854	29,498
U. Dayton	18	122,338	139,036	157,016	10,309	0	9,189	4,614	8,064	29,985	4,653	77,302	12,900
U. Washington, Seattle	19	136,318	149,931	155,076	8,713	27,716	8,269	25,888	37,477	1,904	15,127	6,037	23,945
Arizona State U.	20	135,169	142,175	152,395	0	13,536	6,688	24,164	49,531	2,445	12,032	4,694	39,305
U. Colorado Boulder	21	176,988	171,965	152,391	89,596	10,615	9,858	14,035	12,803	0	10,195	950	4,339
Stanford U.	22	125,627	146,504	134,585	13,315	30,806	18,597	14,868	17,840	0	26,845	8,078	4,236
U. Wisconsin-Madison	23	148,949	118,576	126,587	0	14,141	11,045	11,430	17,001	4,678	10,510	10,701	47,081
U. Minnesota, Twin Cities	24	123,835	124,637	120,976	11,937	23,895	25,172	15,692	20,047	1,887	17,233	5,113	0
U. Tennessee, Knoxville	25	113,852	128,675	116,528	19,305	2,584	6,116	13,773	22,394	27,748	0	11,752	12,856
Cornell U.	26	85,162	92,590	110,545	3,016	15,464	12,347	8,204	22,739	4,427	18,812	17,173	8,363
Wichita State U.	27	62,444	63,328	109,248	105,949	0	0	0	481	228	589	0	2,001
U. Florida	28	97,826	93,580	107,598	5,863	25,506	5,549	2,214	23,844	1,873	10,885	9,588	22,276
Iowa State U.	29	95,306	99,214	104,798	6,271	0	10,114	27,609	22,091	5,580	8,787	0	24,346
Duke U.	30	80,554	92,715	100,379	0	39,559	0	13,331	32,513	0	8,684	4,114	2,178
New York U.	31	79,801	85,767	99,711	0	123	2,148	1,364	14,385	0	2,651	0	79,040
U. California, Los Angeles	32	80,153	91,799	95,797	0	9,045	13,308	6,201	34,672	0	15,668	7,467	9,436
Harvard U.	33	105,231	96,786	95,651	0	65,491	335	4,660	11,751	0	567	11,652	1,195
Carnegie Mellon U.	34	98,781	99,201	95,496	1,398	8,568	11,314	5,844	25,735	0	17,247	8,957	16,433
SUNY, U. Buffalo	35	93,965	95,234	95,040	11,817	14,478	13,211	11,149	3,946	13,373	14,834	276	11,956

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## Higher education R&amp;D expenditures in engineering subfields, ranked by all FY 2019 engineering R&amp;D: FYs 2017–19 and by subfield for FY 2019

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Institution	Rank	2017	2018	2019									
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Vanderbilt U. and Vanderbilt U. Medical Center	36	83,560	87,250	94,340	0	17,235	11,476	16,623	37,686	0	8,855	0	2,465
Rutgers, State U. New Jersey, New Brunswick	37	75,760	104,371	92,937	0	5,055	5,587	3,945	5,595	997	6,372	4,526	60,860
U. California, Davis	38	85,557	89,128	92,277	0	23,576	3,545	39,055	13,445	0	8,940	0	3,716
U. Notre Dame	39	75,064	77,243	89,702	35,548	0	12,652	14,986	23,508	0	0	783	2,225
Woods Hole Oceanographic Institution	40	61,402	61,221	83,974	0	0	0	0	0	0	0	0	83,974
U. Virginia, Charlottesville	41	48,285	70,000	83,072	0	16,718	4,269	5,685	14,882	0	9,388	18,918	13,212
Northwestern U.	42	84,520	81,662	80,413	0	11,844	15,264	4,211	12,630	3,530	6,845	16,820	9,269
Northeastern U.	43	53,443	65,147	79,836	0	6,216	4,277	10,177	27,767	12,998	14,415	0	3,986
Michigan State U.	44	61,918	77,165	79,638	0	21,181	14,839	6,522	18,523	0	11,497	0	7,076
New Jersey Institute of Technology	45	59,726	69,735	78,455	0	9,396	5,917	21,812	4,563	144	2,575	0	34,048
U. Pennsylvania	46	64,279	67,574	78,444	0	22,871	10,328	0	15,628	0	20,673	0	8,944
Boston U.	47	64,275	83,013	78,154	1,385	28,847	38	0	22,146	1,478	11,721	796	11,743
Rice U.	48	73,297	67,934	77,299	0	29,222	9,233	9,114	16,178	0	4,308	6,963	2,281
Clemson U.	49	65,885	73,506	76,739	0	11,723	5,035	16,480	9,839	3,791	14,944	13,021	1,906
U. Southern California	50	69,226	72,961	76,180	1,899	8,926	4,278	7,441	39,615	2,377	7,783	0	3,861
U. Arizona	51	62,925	70,100	75,555	1,880	6,922	4,347	3,558	41,402	3,572	3,836	6,139	3,899
Columbia U. in the City of New York	52	67,996	72,301	72,596	2,541	19,301	5,624	2,432	3,882	1,072	5,708	0	32,036
U. California, Santa Barbara	53	73,594	77,535	67,395	0	11,063	7,663	0	32,838	0	7,599	7,689	543
U. Delaware	54	40,177	52,932	66,447	0	4,621	36,874	8,746	7,874	0	7,241	0	1,091

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## Higher education R&amp;D expenditures in engineering subfields, ranked by all FY 2019 engineering R&amp;D: FYs 2017–19 and by subfield for FY 2019

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Institution	Rank	2017	2018	2019									
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Princeton U.	55	70,261	67,450	65,000	2,313	7,354	4,114	5,585	17,186	2,847	8,814	10,340	6,447
U. Central Florida	56	55,792	62,734	62,258	14,087	1,577	0	6,674	10,399	6,283	9,739	4,642	8,857
Mississippi State U.	57	49,856	48,399	60,183	10,008	1,042	4,314	6,165	7,006	5,085	15,909	1,895	8,759
Rensselaer Polytechnic Institute	58	59,446	57,190	59,831	0	5,780	10,295	6,768	10,945	987	16,802	4,154	4,100
Auburn U., Auburn	59	56,657	56,233	59,742	3,250	1,110	6,733	8,655	9,157	4,593	12,747	656	12,841
Florida State U.	60	50,234	56,281	56,352	3,106	3,900	3,153	5,538	14,713	2,254	20,643	2,566	479
U. California, Irvine	61	53,016	70,449	55,995	0	9,942	8,339	10,785	13,077	0	12,402	0	1,450
U. Utah	62	39,993	42,053	55,478	0	10,282	3,073	4,815	11,078	1	11,561	5,637	9,031
U. North Dakota	63	43,485	52,960	54,760	0	0	1,044	42,263	1,741	0	745	752	8,215
U. Texas, Arlington	64	41,258	48,513	54,121	4,365	5,848	0	8,349	6,943	11,163	4,365	0	13,088
U. Nebraska, Lincoln	65	48,890	49,434	53,932	0	9,912	3,459	18,353	8,608	185	5,600	6,334	1,481
U. Houston	66	54,497	50,047	51,806	2,443	9,693	11,307	6,788	7,465	385	5,169	1,231	7,325
U. Kentucky	67	45,416	47,821	50,743	2,449	909	4,707	10,129	1,746	295	2,565	5,275	22,668
U. Iowa	68	54,200	50,848	50,377	0	787	1,060	23,273	3,905	798	1,803	0	18,751
U. Massachusetts, Amherst	69	53,718	54,219	49,745	0	998	14,492	13,705	11,198	0	8,456	0	896
Oregon State U.	70	51,184	49,271	49,587	74	3,792	3,800	10,230	10,882	3,179	8,029	911	8,690
U. Texas, Dallas	71	45,588	43,363	48,666	0	14,653	0	0	7,989	215	4,835	6,066	14,908
U. Alabama, Birmingham	72	47,730	48,102	47,555	8,995	6,400	4,368	1,033	3,121	0	5,308	15,526	2,804
Michigan Technological U.	73	39,627	45,745	47,435	0	2,645	2,473	3,973	8,788	0	20,015	3,868	5,673

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California Institute of Technology	74	61,771	45,494	46,972	9,108	892	5,548	12,598	5,799	0	368	0	12,659
U. Cincinnati	75	33,618	44,588	46,889	6,019	1,201	4,367	8,620	9,499	0	14,569	0	2,614
U. Missouri, Columbia	76	40,865	42,403	46,142	0	2,926	952	3,692	4,323	378	2,543	128	31,200
U. Pittsburgh, Pittsburgh	77	43,801	44,995	46,075	0	12,918	9,303	3,073	7,437	1,982	8,385	0	2,977
Louisiana State U., Baton Rouge	78	41,065	44,604	45,803	0	0	7,978	12,298	2,651	452	4,758	5,613	12,053
U. South Florida, Tampa	79	46,796	45,487	45,508	0	2,113	3,408	27,848	4,907	1,123	3,956	0	2,153
Colorado School of Mines	80	32,824	35,504	44,195	161	1,375	5,114	5,041	664	0	6,130	17,834	7,876
Texas Tech U.	81	46,553	40,249	44,057	0	0	7,174	9,103	12,927	2,012	5,224	0	7,617
U. Connecticut	82	39,840	39,907	44,044	0	3,414	6,223	14,185	7,957	0	4,870	5,250	2,145
Colorado State U., Fort Collins	83	40,921	38,919	42,609	0	550	2,747	16,251	9,512	0	12,942	0	607
West Virginia U.	84	36,747	37,520	42,516	148	0	5,080	5,216	6,600	2,406	15,612	1,315	6,139
Washington State U.	85	50,463	48,384	42,273	254	4,408	4,966	6,879	7,211	1,339	5,247	7,382	4,587
Case Western Reserve U.	86	40,120	46,184	41,228	0	19,204	6,822	916	7,050	0	6,911	0	325
U. Alabama, Huntsville	87	32,555	34,105	40,733	22,743	218	941	2,182	6,394	3,627	3,967	374	287
Wright State U.	88	34,024	43,039	39,164	8,671	17,487	0	0	8,138	1,269	1,883	19	1,697
U. California, Santa Cruz	89	33,669	29,724	39,111	0	0	0	0	2,805	0	0	0	36,306
U. New Mexico	90	36,052	35,067	37,950	5,772	1,000	4,086	4,609	11,462	979	1,848	736	7,458
Yale U.	91	30,905	35,939	36,591	75	13,402	4,723	53	9,960	0	7,533	0	845
Montana State U., Bozeman	92	25,633	25,643	36,521	0	5,321	1,188	7,421	2,546	338	3,030	4	16,673

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George Mason U.	93	11,185	15,785	36,101	101	3,333	3	5,410	3,162	22,672	896	0	524
Florida International U.	94	29,106	31,410	35,138	0	6,237	0	11,603	9,215	71	1,671	1,688	4,653
U. Arkansas, Fayetteville	95	32,981	36,132	34,590	0	5,800	4,446	6,038	9,982	2,781	3,547	0	1,996
Missouri U. of Science and Technology	96	31,077	33,241	33,895	1,250	63	1,436	5,866	7,093	791	5,818	9,877	1,701
U. Massachusetts, Lowell	97	20,422	27,676	33,128	0	4,701	10,292	2,318	6,714	0	6,649	0	2,454
Oklahoma State U., Stillwater	98	39,179	37,003	32,947	11,298	4	5,310	5,077	2,876	1,404	25	578	6,375
Mercer U.	99	23,942	23,532	32,624	10,878	0	0	12	539	0	12,411	8,021	763
U. Maine	100	22,065	27,459	32,368	0	53	8,306	1,232	2,268	1,937	2,286	15,707	579
U. Alabama, Tuscaloosa	101	19,382	24,667	31,845	1,516	119	2,388	5,748	12,791	0	3,806	4,124	1,353
U. North Carolina, Chapel Hill	102	29,932	28,509	31,825	0	9,342	0	18,637	0	3,846	0	0	0
U. South Carolina, Columbia	103	30,893	31,294	31,748	0	0	6,061	2,234	5,209	0	18,244	0	0
Tufts U.	104	20,037	27,130	31,630	225	19,575	3,937	3,001	2,408	0	2,248	0	236
Drexel U.	105	32,240	31,625	31,330	0	5,705	5,572	3,693	3,214	0	3,674	7,679	1,793
Dartmouth C. and Dartmouth Hitchcock Medical Center	106	29,893	31,903	31,110	0	12,768	4,115	444	3,232	5	7,539	0	3,007
SUNY, Binghamton U.	107	26,681	35,406	30,434	0	3,865	0	0	5,171	11,577	7,792	0	2,029
U. California, Riverside	108	29,971	29,206	29,020	0	2,369	5,761	9,083	5,865	0	4,751	284	907

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SUNY, Stony Brook U.	109	32,483	28,015	28,632	0	7,047	0	1,854	5,365	0	3,778	6,614	3,974
U.S. Air Force Academy	110	33,831	28,645	28,489	2,830	0	0	50	140	0	25,090	0	379
U. Louisiana, Lafayette	111	9,569	13,188	28,397	0	0	4,974	4,395	2,806	0	6,712	1,277	8,233
CUNY, City C.	112	26,479	28,252	28,337	0	5,135	2,231	14,119	2,682	0	3,196	0	974
U. Illinois, Chicago	113	23,478	25,079	28,226	0	10,735	1,456	3,971	3,429	0	8,345	262	28
Kansas State U.	114	24,976	26,577	27,439	1,188	0	3,751	4,053	3,411	1,538	7,760	0	5,738
U. Texas, El Paso	115	27,643	27,260	26,586	1	977	0	4,721	7,331	1,776	8,595	1,139	2,046
U. Oklahoma, Norman and Health Science Center	116	24,840	23,293	26,569	3,988	1,353	1,458	4,923	8,215	964	0	0	5,668
Virginia Commonwealth U.	117	23,146	20,262	26,072	0	3,733	15,130	0	1,919	0	3,590	0	1,700
New Mexico State U.	118	26,947	23,067	25,892	7,650	5	2,171	3,735	2,279	47	1,133	165	8,707
Stevens Institute of Technology	119	24,180	22,396	25,832	126	1,496	1,268	388	1,303	0	1,324	87	19,840
Syracuse U.	120	23,081	22,145	25,412	517	5,032	0	3,119	8,816	0	5,458	0	2,470
U. New Hampshire	121	22,103	19,239	23,861	0	0	1,788	7,745	9,157	0	4,809	362	0
U. Chicago	122	12,066	16,388	23,773	0	0	0	0	0	0	0	0	23,773
U. Nevada, Reno	123	16,982	19,373	23,568	1,981	1,529	2,025	9,364	1,772	0	2,528	2,020	2,349
Brown U.	124	24,798	28,149	23,448	0	6,694	2,878	0	2,452	0	2,944	4,458	4,022
Lehigh U.	125	23,562	24,564	23,447	0	374	2,772	5,676	5,035	1,345	4,564	3,677	4
Washington U., Saint Louis	126	24,627	24,238	23,090	0	8,537	6,616	1,130	4,256	0	0	1,873	678

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## Higher education R&amp;D expenditures in engineering subfields, ranked by all FY 2019 engineering R&amp;D: FYs 2017–19 and by subfield for FY 2019

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Naval Postgraduate School	127	18,739	19,675	22,498	6,269	7	0	12	3,988	19	1,434	570	10,199
George Washington U.	128	16,438	17,136	21,712	2,296	5,119	0	3,024	5,385	1,905	2,093	29	1,861
Worcester Polytechnic Institute	129	21,355	20,617	21,029	0	3,058	2,017	494	2,024	0	11,327	1,599	510
U. Kansas	130	17,856	17,481	20,869	1,057	4,556	3,861	3,696	5,193	0	707	4	1,795
Air Force Institute of Technology	131	26,096	22,908	20,525	5,181	0	0	206	5,946	8,198	0	994	0
Rochester Institute of Technology	132	21,517	18,611	20,264	0	1,313	696	22	6,303	2,361	1,242	0	8,327
U. Texas, San Antonio	133	17,717	17,781	19,928	0	2,689	0	4,138	2,467	428	2,494	0	7,712
U. Wyoming	134	39,901	36,672	19,550	0 i	0 i	11,032 i	3,118 i	2,627 i	0 i	2,681 i	0 i	92 i
Ohio U.	135	23,201 i	21,226 i	19,502	3,327	0	8,242	1,359	471	102	749	399	4,853
Old Dominion U.	136	19,086	17,074	19,294	1,746	0	0	1,804	6,794	513	1,049	0	7,388
U. Georgia	137	15,071	21,346	18,444	6	2,115	5,126	5,809	3,629	0	0	0	1,759
U. Louisville	138	17,536	17,321	17,640	0	4,844	1,295	1,510	4,901	845	1,461	71	2,713
U. Idaho	139	16,894	17,190	17,497	1,304	779	375	3,385	2,452	1	598	612	7,991
Cleveland State U.	140	15,635	15,184	17,278	0	10,668	1,394	336	1,687	125	1,877	0	1,191
U. Hawaii, Manoa	141	21,992	21,367	17,089	0	611	0	3,969	6,889	0	1,723	0	3,897
U. Akron	142	24,042	18,878	16,650	0	1,211	5,103	5,322	1,906	0	2,977	0	131
U. Puerto Rico, Mayaguez	143	12,898	13,704	16,446	0	14	4,293	3,204	3,694	942	1,152	1,460	1,687
U. North Carolina, Charlotte	144	7,972	11,933	16,000	0	95	0	3,934	3,618	28	4,385	0	3,940
U. North Texas, Denton	145	12,485	13,114	15,773	0	833	0	0	1,293	0	1,070	11,603	974



TABLE 55

## Higher education R&amp;D expenditures in engineering subfields, ranked by all FY 2019 engineering R&amp;D: FYs 2017–19 and by subfield for FY 2019

(Dollars in thousands)

Institution	Rank	2017	2018	2019									
				All engineering	Aerospace, aeronautical, and astronautical engineering	Bioengineering and biomedical engineering	Chemical engineering	Civil engineering	Electrical, electronic, and communications engineering	Industrial and manufacturing engineering	Mechanical engineering	Metallurgical and materials engineering	Engineering nec
U. Nevada, Las Vegas	146	12,018	16,192	15,736	361	83	0	5,323	2,392	0	4,819	115	2,643
Illinois Institute of Technology	147	12,117	12,976	15,241	1,562	6,918	199	805	4,007	325	433	427	565
U. Alaska, Fairbanks	148	17,627	14,027	14,922	1,493	131	277	5,274	5,572	0	132	45	1,998
U. Rochester	149	10,596	13,418	14,872	0	6,212	1,008	0	4,631	0	1,954	0	1,067
Wayne State U.	150	16,668	17,235	14,634	0	3,611	3,119	2,673	1,979	856	1,968	0	428
New Mexico Institute of Mining and Technology	151	11,260	13,245	14,043	262	0	5,059	265	263	0	1,380	85	6,729
Brigham Young U., Provo	152	14,904	14,827	14,001	0	0	2,479	1,477	4,340	100	5,148	0	457
U. California, Merced	153	11,823	12,912	13,852	0	1,939	0	6,382	1,137	0	3,777	0	617
U. Tulsa	154	13,770	14,054	13,213	0	0	883	0	703	0	2,795	0	8,832
Oregon Health and Science U.	155	16,233	11,941	12,134	0	12,134	0	0	0	0	0	0	0
North Dakota State U.	156	13,053	11,555	12,030	0	0	0	2,384	2,545	673	2,726	0	3,702
North Carolina Agricultural and Technical State U.	157	12,648	13,123	11,766	0	169	0	1,506	1,934	1,395	2,654	0	4,108
Boise State U.	158	9,717	11,907	11,688	20	678	267	875	2,556	540	126	4,492	2,134
Louisiana Tech U.	159	9,552	10,333	11,513	0	2,837	1,126	1,604	1,070	56	1,880	949	1,991
Florida Atlantic U.	160	8,585	12,099	11,450	52	0	43	2,833	97	0	0	0	8,425
Indiana U., Bloomington	161	6,194	7,928	11,265	0	678	0	0	0	10,587	0	0	0
U. Toledo	162	10,161	10,410	11,256	0	1,259	1,980	1,475	523	0	4,475	0	1,544

TABLE 55

## Higher education R&amp;D expenditures in engineering subfields, ranked by all FY 2019 engineering R&amp;D: FYs 2017–19 and by subfield for FY 2019

(Dollars in thousands)

Institution	Rank	2017	2018	2019									
				All engineering	Aerospace, aeronautical, and astronautical engineering	Bioengineering and biomedical engineering	Chemical engineering	Civil engineering	Electrical, electronic, and communications engineering	Industrial and manufacturing engineering	Mechanical engineering	Metallurgical and materials engineering	Engineering nec
South Dakota School of Mines and Technology	163	13,572	13,111	11,226	0	0	3,377	1,401	569	82	349	1,939	3,509
Clarkson U.	164	10,487	12,058	10,889	0	0	2,739	3,030	3,046	0	2,037	36	1
U. Rhode Island	165	7,642	7,910	10,632	0	318	1,165	2,355	1,518	0	1,371	0	3,905
U. Wisconsin-Milwaukee	166	9,745	10,024	9,915	0	159	0	1,778	2,693	409	3,216	886	774
Emory U.	167	4,872	6,000	9,614	0	9,614	0	0	0	0	0	0	0
Villanova U.	168	7,988	9,293	9,612	0	0	1,182	3,361	1,456	0	1,721	0	1,892
U. Memphis	169	8,077	9,806	9,464	0	2,249	0	4,671	497	0	1,203	0	844
Southern Methodist U.	170	6,174	6,835	9,207	0	0	0	2,058	3,089	0	3,257	0	803
Portland State U.	171	7,488	9,010	9,160	193	89	0	4,479	2,038	0	1,307	639	415
Marquette U.	172	8,915	7,898	8,988	0	3,316	0	993	1,716	0	747	0	2,216
U. Mississippi	173	7,247	5,462	8,821	691	1	2,256	1,289	1,194	395	1,276	0	1,719
Rowan U.	174	4,062	5,541	8,447	0	1,799	1,597	2,724	417	0	243	0	1,667
U. Maryland, Baltimore County	175	14,075	8,715	8,429	46	3,303	1,089	426	1,541	46	1,297	0	681
Tulane U.	176	6,801	7,435	8,416	0	4,669	3,141	595	0	0	0	0	11
Howard U.	177	8,402	9,112	8,401	516	0	571	1,400	3,227	0	1,224	210	1,253
Embry-Riddle Aeronautical U.	178	11,223	12,926	8,374	6,322	0	0	150	682	0	579	0	641
San Diego State U.	179	8,935	8,534	8,197	640	331	0	2,428	2,169	0	2,157	0	472
Temple U.	180	6,558	7,719	8,042	0	2,254	0	1,667	1,792	0	1,628	0	701
U. Vermont	181	8,743	7,712	7,864	1,865	295	0	2,204	2,011	0	1,238	0	251
Medical C. Wisconsin	182	0	6,669	7,774	0	7,774	0	0	0	0	0	0	0
U. Massachusetts, Dartmouth	183	7,666	7,404	7,764	0	1,474	0	2,662	1,914	0	1,530	0	184

TABLE 55

## Higher education R&amp;D expenditures in engineering subfields, ranked by all FY 2019 engineering R&amp;D: FYs 2017–19 and by subfield for FY 2019

(Dollars in thousands)

Institution	Rank	2017	2018	2019									
				All engineering	Aerospace, aeronautical, and astronautical engineering	Bioengineering and biomedical engineering	Chemical engineering	Civil engineering	Electrical, electronic, and communications engineering	Industrial and manufacturing engineering	Mechanical engineering	Metallurgical and materials engineering	Engineering nec
California State U., Sacramento	184	7,527	7,196	7,507	0	0	0	7,164	117	0	226	0	0
U.S. Naval Academy	185	7,414	7,823	7,482	768	0	0	0	1,009	0	2,140	0	3,565
Tennessee Technological U.	186	5,927	7,301	7,267	0	0	198	2,278	1,746	383	2,491	0	171
Texas A&M U.-Corpus Christi	187	4,820	7,089	7,193	5,602	0	0	185	99	28	381	0	898
U. Missouri, Kansas City	188	3,314	4,385	7,087	0	0	0	797	5,944	0	346	0	0
U. Michigan, Dearborn	189	6,870	6,503	6,832	0	0	0	0	3,239	916	1,847	0	830
Indiana U.-Purdue U., Indianapolis	190	6,221	6,034	6,730	0	1,832	0	9	1,995	0	2,492	0	402
U. Tennessee, Knoxville, Institute of Agriculture	191	5,056	5,643	5,637	0	0	0	0	0	0	0	0	5,637
Western Michigan U. and Homer Stryker M.D. School of Medicine	192	5,921	5,810	5,595	385	519	1,073	1,995	576	135	370	319	223
South Dakota State U.	193	5,807	5,391	5,516	0	0	0	877	884	0	375	0	3,380
U. Miami	194	5,969	5,201	5,400	0	782	0	2,641	531	0	759	0	687
Tuskegee U.	195	6,532	5,297	5,372	52	551	0	0	683	0	634	3,452	0
Humboldt State U.	196	5,625	4,118	5,232	0	6	0	188	4,252	39	0	44	703
Prairie View A&M U.	197	3,359	3,835	5,121	61	0	123	338	3,581	0	212	0	806
Alfred U.	198	3,168	3,599	5,032	0	0	0	0	0	0	0	5,032	0

TABLE 55

## Higher education R&amp;D expenditures in engineering subfields, ranked by all FY 2019 engineering R&amp;D: FYs 2017–19 and by subfield for FY 2019

(Dollars in thousands)

Institution	Rank	2017	2018	2019									
				All engineering	Aerospace, aeronautical, and astronautical engineering	Bioengineering and biomedical engineering	Chemical engineering	Civil engineering	Electrical, electronic, and communications engineering	Industrial and manufacturing engineering	Mechanical engineering	Metallurgical and materials engineering	Engineering nec
U. Colorado Denver and Anschutz Medical Campus	199	5,331	4,610	5,003	0	1,818	153	1,023	1,488	0	398	0	123
Florida Institute of Technology	200	6,593	5,427	4,782	1,163	365	67	587	422	73	1,209	49	847
Texas State U.	201	4,248	3,504	4,611	0	2	0	8	55	0	0	2,764	1,782
Florida A&M U.	202	2,485	2,844	4,477	0	0	583	1,565	192	608	306	0	1,223
Montana Technological U.	203	4,887	4,464	4,428	0	0	71	264	259	0	106	3,701	27
California State U., Long Beach	204	2,269	5,150	4,223	440	382	329	1,224	769	81	415	0	583
California Polytechnic State U., San Luis Obispo	205	4,196	3,542	4,116	275	106	0	1,505	21	166	681	49	1,313
Idaho State U.	206	5,660	4,725	4,039	0	0	0	109	0	0	162	0	3,768
U. Denver	207	4,940	3,992	4,010	0	1,757	0	205	1,115	0	0	933	0
Youngstown State U.	208	3,712	4,044	3,993	0	0	0	186	261	351	3,110	85	0
Morgan State U.	209	3,795	3,002	3,990	0	0	0	1,698	875	326	0	0	1,091
Oakland U.	210	3,651	3,709	3,836	0	0	0	0	1,363	260	2,213	0	0
Milwaukee School of Engineering	211	2,792	2,936	3,825	0	175	0	1,912	0	0	1,287	0	451
U.S. Military Academy	212	3,668	3,020	3,799	988	0	578	1,000	143	0	1,090	0	0
Baylor U.	213	4,938	4,494	3,720	194	401	537	0	1,425	0	1,163	0	0
U. Texas Rio Grande Valley	214	4,534	4,226	3,573	21	134	0	327	502	374	987	0	1,228
U. Southern Mississippi	215	1,521	1,214	3,371	0	0	0	1	0	0	0	0	3,370

TABLE 55

## Higher education R&amp;D expenditures in engineering subfields, ranked by all FY 2019 engineering R&amp;D: FYs 2017–19 and by subfield for FY 2019

(Dollars in thousands)

Institution	Rank	2017	2018	2019									
				All engineering	Aerospace, aeronautical, and astronautical engineering	Bioengineering and biomedical engineering	Chemical engineering	Civil engineering	Electrical, electronic, and communications engineering	Industrial and manufacturing engineering	Mechanical engineering	Metallurgical and materials engineering	Engineering nec
Jackson State U.	216	4,298	3,385	3,354	0	0	0	1,594	1,699	0	0	0	61
U. South Dakota	217	3,443	3,198	3,243	0	3,243	0	0	0	0	0	0	0
Missouri State U.	218	1,198	2,200	3,234	0	0	0	0	0	0	0	3,234	0
SUNY, U. Albany	219	1,214	1,941	3,087	0	0	0	0	1,876	0	0	0	1,211
Miami U.	220	2,887	2,271	3,070	0	753	745	0	923	0	470	0	179
California State U., Maritime Academy	221	1,860	2,924	2,959	0	0	89	0	0	60	85	0	2,725
Southern Illinois U., Carbondale	222	3,427	3,381	2,905	0	0	36	80	758	0	423	87	1,521
New School	223	37	1,797	2,828	0	0	1,165	66	5	37	1,477	0	78
Northern Arizona U.	224	3,515	4,454	2,613	0	1,040	0	131	513	0	394	0	535
Catholic U. of America	225	1,937	1,973	2,587	0	614	0	351	903	0	719	0	0
U. Tennessee, Chattanooga	226	1,454	1,674	2,460	0	0	116	385	640	0	131	0	1,188
California State U., San Bernardino	227	4	1,133	2,434	0	0	0	2,434	0	0	0	0	0
U. South Alabama	228	2,852	1,956	2,411	0	0	822	550	560	0	363	0	116
U. Minnesota, Duluth	229	2,156	2,570	2,399	0	0	108	737	262	838	0	0	454
U. North Florida	230	2,320	2,832	2,392	0	0	0	1,106	86	81	742	0	377
U. New Orleans	231	3,422	2,447	2,376	0	0	0	226	766	0	742	0	642
Alabama A&M U.	232	3,888	3,122	2,354	0	0	0	629	1,094	0	631	0	0
Southern Illinois U., Edwardsville	233	4,334	2,666	2,348	21	635	0	255	712	282	145	0	298

TABLE 55

## Higher education R&amp;D expenditures in engineering subfields, ranked by all FY 2019 engineering R&amp;D: FYs 2017–19 and by subfield for FY 2019

(Dollars in thousands)

Institution	Rank	2017	2018	2019									
				All engineering	Aerospace, aeronautical, and astronautical engineering	Bioengineering and biomedical engineering	Chemical engineering	Civil engineering	Electrical, electronic, and communications engineering	Industrial and manufacturing engineering	Mechanical engineering	Metallurgical and materials engineering	Engineering nec
Saint Louis U.	234	1,027	1,346	2,344	610	1,065	0	666	3	0	0	0	0
Kent State U.	235	1,492	1,857	2,330	329	512	434	12	303	46	87	0	607
U. Ana G. Mendez, Gurabo	236	620	501	2,324	0	0	0	0	1,749	0	0	0	575
Delaware State U.	237	962	1,807	2,248	2,248	0	0	0	0	0	0	0	0
U. North Carolina, general administration	238	2,313	2,311	2,239	0	1,084	0	0	536	0	76	543	0
U. Arkansas, Little Rock	239	1,852	1,921	2,116	1,838	2	68	0	0	0	125	0	83
California State U., Bakersfield	240	729	1,271	2,050	0	0	0	0	219	0	0	0	1,831
Kennesaw State U.	241	834	549	2,044	0	0	0	456	337	107	869	0	275
East Carolina U.	242	546	1,276	2,015	0	0	0	1,032	382	0	0	0	601
Pittsburg State U.	243	1,933	1,978	1,990	12	486	1,492	0	0	0	0	0	0
Norfolk State U.	244	1,819	1,501	1,940	0	0	0	0	22	0	0	0	1,918
Southern U. and A&M C., Baton Rouge	245	852	1,523	1,905	0	0	0	69	87	0	1,749	0	0
San Jose State U.	246	1,076	1,451	1,864	1	0	430	3	753	231	118	0	328
Texas A&M U.-Kingsville	247	2,337	1,906	1,827	0	0	52	79	287	0	918	1	490
Florida Polytechnic U.	248	ne	ne	1,739	0	0	0	0	99	862	232	262	284
U. Nebraska, central administration	249	ne	2,800	1,687	0	148	0	218	976	0	345	0	0
Bucknell U.	250	1,628	1,733	1,632	0	96	329	321	94	0	350	0	442
Lamar U.	251	2,734	2,280	1,609	0	0	864	79	105	398	163	0	0

TABLE 55

## Higher education R&amp;D expenditures in engineering subfields, ranked by all FY 2019 engineering R&amp;D: FYs 2017–19 and by subfield for FY 2019

(Dollars in thousands)

Institution	Rank	2017	2018	2019										
				All engineering	Aerospace, aeronautical, and astronautical engineering	Bioengineering and biomedical engineering	Chemical engineering	Civil engineering	Electrical, electronic, and communications engineering	Industrial and manufacturing engineering	Mechanical engineering	Metallurgical and materials engineering	Engineering nec	
U. Texas Medical Branch	252	1,333	2,528	1,596	0	1,185	411	0	0	0	0	0	0	0
U. Oklahoma, Tulsa	253	938	1,432	1,549	0	0	0	0	1,549	0	0	0	0	0
U. South Carolina, Aiken	254	1,404	1,490	1,520	0	0	0	0	0	0	0	0	0	1,520
Pennsylvania State U., Behrend	255	1,151	1,112	1,508	0	271	0	135	271	213	346	272	0	0
California State U., Fresno	256	1,298	1,520	1,492	0	0	0	853	397	142	33	0	0	67
Minnesota State U., Mankato	257	616	1,204	1,472	0	0	0	0	538	0	186	0	0	748
Northern Illinois U.	258	1,215	1,072	1,418	0	0	0	0	11	1,072	198	0	0	137
U. Alaska, Anchorage	259	2,066	2,196	1,393	0	0	2	476	186	0	6	0	0	723
CUNY, Advanced Science Research Center	260	1,019	1,564	1,379	0	278	25	1,076	0	0	0	0	0	0
Kettering U.	261	2,271	1,516	1,354	0	0	150	0	200	7	997	0	0	0
Purdue U., Northwest	262	2,904	2,307	1,352	0	0	0	29	94	620	609	0	0	0
SUNY, C. of Environmental Science and Forestry	263	2,975	1,245	1,339	0	689	239	411	0	0	0	0	0	0
U. Hartford	264	1,304	440	1,300	0	0	0	0	0	0	1,300	0	0	0
San Francisco State U.	265	1,595	1,492	1,284	0	95	0	381	497	0	311	0	0	0
Georgia Southern U.	266	1,766	1,110	1,257	0	0	20	250	230	197	356	59	0	145

TABLE 55

## Higher education R&amp;D expenditures in engineering subfields, ranked by all FY 2019 engineering R&amp;D: FYs 2017–19 and by subfield for FY 2019

(Dollars in thousands)

Institution	Rank	2017	2018	2019										
				All engineering	Aerospace, aeronautical, and astronautical engineering	Bioengineering and biomedical engineering	Chemical engineering	Civil engineering	Electrical, electronic, and communications engineering	Industrial and manufacturing engineering	Mechanical engineering	Metallurgical and materials engineering	Engineering nec	
U. Massachusetts, Boston	267	1,549	1,220	1,255	0	0	0	0	0	1,027	0	0	0	228
U. North Carolina, Wilmington	268	778	1,659	1,226	741	0	0	0	0	485	0	0	0	0
North Carolina Central U.	269	0	0	1,212	0	0	0	0	0	0	0	0	0	1,212
Tennessee State U.	270	2,120	1,467	1,207	0	0	0	248	660	0	287	10	2	
West Texas A&M U.	271	957	1,058	1,178	0	0	352	183	34	23	0	0	586	
Marshall U.	272	1,341	1,011	1,158	0	1	0	1,153	0	0	0	4	0	
California State Polytechnic U., Pomona	273	915	1,248	1,085	164	0	91	760	0	0	70	0	0	
Hampton U.	274	1,730	1,296	1,049	60	0	154	0	835	0	0	0	0	
New York Institute of Technology	275	315	698	1,045	0	213	0	0	746	0	86	0	0	
Polytechnic U. Puerto Rico	276	ne	ne	1,021	0	0	0	489	0	0	0	0	532	
U. New Haven	277	890	906	1,013	49	28	13	139	15	452	81	0	236	
California State U., Los Angeles	278	787	762	1,009	0	0	0	425	461	0	108	0	15	
CUNY, system office	279	0	2,245	1,001	0	0	0	0	0	0	0	0	1,001	
U. Nebraska, Omaha	280	779	515	993	708	227	0	0	58	0	0	0	0	
Bradley U.	281	1,560	885	945	0	0	0	206	34	27	396	0	282	
Harvey Mudd C.	282	856	596	884	9	41	33	283	78	2	262	10	166	
Lawrence Technological U.	283	1,470	996	882	0	15	0	764	22	0	72	0	9	
Santa Clara U.	284	658	535	876	0	27	0	62	169	0	618	0	0	





TABLE 55

## Higher education R&amp;D expenditures in engineering subfields, ranked by all FY 2019 engineering R&amp;D: FYs 2017–19 and by subfield for FY 2019

(Dollars in thousands)

Institution	Rank	2017	2018	2019									
				All engineering	Aerospace, aeronautical, and astronautical engineering	Bioengineering and biomedical engineering	Chemical engineering	Civil engineering	Electrical, electronic, and communications engineering	Industrial and manufacturing engineering	Mechanical engineering	Metallurgical and materials engineering	Engineering nec
California State U., Chico	302	337	305	567	0	0	0	541	2	0	24	0	0
Central Michigan U.	303	650	657	559	394	0	6	0	159	0	0	0	0
Arkansas State U., Jonesboro	304	496	490	553	0	0	0	309	14	0	230	0	0
Smith C.	304	674	563	553	6	182	0	213	45	0	20	0	87
U. Oregon	306	0	0	541	0	541	0	0	0	0	0	0	0
Franklin W. Olin C. of Engineering	307	1,079	789	534	37	0	0	0	60	0	290	0	147
Savannah State U.	308	302	429	526	0	0	391	0	0	0	0	0	135
Duquesne U.	309	651	588	525	0	525	0	0	0	0	0	0	0
Hofstra U.	310	959	717	521	0	0	0	7	0	0	0	0	514
CUNY, New York City C. of Technology	311	ne	601	478	0	0	0	129	36	313	0	0	0
Pace U.	312	1,435	735	435	0	0	0	0	0	0	435	0	0
Western Illinois U.	313	639	711	409	0	0	0	0	0	0	409	0	0
U. of St. Thomas (MN)	314	203	617	407	0	0	0	11	32	0	78	0	286
Grand Valley State U.	315	246	40	400	0	390	0	0	3	0	6	0	1
U. Texas, Tyler	316	469	405	394	0	0	0	178	4	0	194	0	18
U. Portland	317	ne	ne	393	0	0	0	0	0	0	0	0	393
Wake Forest U.	318	0	49	385	0	0	0	0	0	0	0	0	385
Xavier U. Louisiana	319	152	241	376	0	0	0	0	0	0	0	0	376
Western Carolina U.	320	108	136	365	0	0	0	85	0	0	0	0	280
Maine Maritime Academy	321	1,763	1,093	358	0	3	39	0	0	0	0	0	316



TABLE 55

## Higher education R&amp;D expenditures in engineering subfields, ranked by all FY 2019 engineering R&amp;D: FYs 2017–19 and by subfield for FY 2019

(Dollars in thousands)

Institution	Rank	2017	2018	2019									
				All engineering	Aerospace, aeronautical, and astronautical engineering	Bioengineering and biomedical engineering	Chemical engineering	Civil engineering	Electrical, electronic, and communications engineering	Industrial and manufacturing engineering	Mechanical engineering	Metallurgical and materials engineering	Engineering nec
U. Washington, Bothell	343	0	86	161	0	0	0	0	146	0	0	0	15
Loyola Marymount U.	344	158	553	160	0	0	0	111	11	10	28	0	0
U. Michigan, Flint	345	199	140	152	0	0	0	0	0	0	0	0	152
Claflin U.	346	5	56	145	2	48	0	0	9	0	0	86	0
U. Wisconsin-Platteville	346	170	ne	145	0	0	0	12	27	10	53	3	40
Texas Southern U.	348	89	98	130	0	0	0	0	0	0	0	0	130
Hope C.	349	193	55	128	0	0	0	0	0	0	128	0	0
St. Cloud State U.	350	101	183	121	0	0	0	0	72	0	34	0	15
Central Connecticut State U.	351	130	ne	119	97	0	0	12	0	0	3	0	7
Union C., Schenectady	352	145	119	118	0	0	0	2	44	0	72	0	0
Calvin U.	353	95	159	111	0	24	0	0	21	0	0	0	66
Trinity U.	354	108	108	103	0	0	7	0	0	0	96	0	0
CUNY, York C.	355	ne	ne	91	0	90	0	0	0	0	0	0	1
U. Maryland Center for Environmental Science	356	393	160	90	0	0	0	89	1	0	0	0	0
Elon U.	357	82	83	87	0	21	0	0	0	0	0	0	66
Trinity C., Hartford	358	62	86	86	0	0	0	0	0	0	0	0	86
Texas Christian U.	359	199	175	73	0	0	0	0	0	73	0	0	0
Central Washington U.	360	6	13	70	0	0	0	0	0	66	0	0	4
Texas A&M U.-Central Texas	360	ne	378	70	0	0	0	0	45	0	0	0	25

TABLE 55

## Higher education R&amp;D expenditures in engineering subfields, ranked by all FY 2019 engineering R&amp;D: FYs 2017–19 and by subfield for FY 2019

(Dollars in thousands)

Institution	Rank	2017	2018	2019										
				All engineering	Aerospace, aeronautical, and astronautical engineering	Bioengineering and biomedical engineering	Chemical engineering	Civil engineering	Electrical, electronic, and communications engineering	Industrial and manufacturing engineering	Mechanical engineering	Metallurgical and materials engineering	Engineering nec	
U. of the Pacific	362	195	165	68	0	0	0	0	0	0	0	68	0	0
Tarleton State U.	363	0	0	61	0	0	0	0	0	0	0	0	0	61
U. of the Virgin Islands	363	0	87	61	0	0	0	0	0	0	0	0	0	61
Bowling Green State U.	365	20	10	60	0	0	0	41	0	0	0	0	0	19
Fairfield U.	365	267	375	60	0	0	0	0	0	0	0	0	0	60
Florida Gulf Coast U.	367	139	270	59	0	0	0	56	0	0	0	0	0	3
Middle Tennessee State U.	367	283	540	59	7	0	0	3	0	49	0	0	0	0
Azusa Pacific U.	369	179	38	50	0	0	0	0	0	0	0	50	0	0
Andrews U.	370	ne	ne	47	0	0	0	0	0	0	0	0	0	47
U. of the Incarnate Word	370	ne	0	47	0	0	0	0	0	0	0	0	0	47
U. Houston-Downtown	372	2	7	42	0	0	0	0	0	0	0	0	0	42
Providence C.	373	42	23	41	0	0	0	0	0	0	0	40	0	1
U. Maryland, Eastern Shore	374	30	43	40	0	0	0	0	40	0	0	0	0	0
U. Puerto Rico, Rio Piedras	375	3,334	326	37	0	37	0	0	0	0	0	0	0	0
Roger Williams U.	376	103	94	36	0	0	0	14	0	0	0	0	0	22
West Virginia State U.	377	188	328	34	0	34	0	0	0	0	0	0	0	0
Texas A&M International U.	378	166	91	30	0	10	0	0	5	0	1	0	0	14
Texas A&M U.-Commerce	379	3	5	28	0	0	0	0	0	0	0	0	0	28
U. Southern Maine	380	113	3	23	0	0	0	0	0	23	0	0	0	0



TABLE 55

## Higher education R&amp;D expenditures in engineering subfields, ranked by all FY 2019 engineering R&amp;D: FYs 2017–19 and by subfield for FY 2019

(Dollars in thousands)

Institution	Rank	2017	2018	2019										
				All engineering	Aerospace, aeronautical, and astronautical engineering	Bioengineering and biomedical engineering	Chemical engineering	Civil engineering	Electrical, electronic, and communications engineering	Industrial and manufacturing engineering	Mechanical engineering	Metallurgical and materials engineering	Engineering nec	
Southern Connecticut State U.	400	0	0	3	0	1	0	0	0	0	0	0	2	0
Wheaton C., Wheaton	400	0	0	3	3	0	0	0	0	0	0	0	0	0
East Tennessee State U.	402	0	0 i	2 i	0 i	0 i	0 i	0 i	0 i	0 i	0 i	0 i	0 i	2 i
CUNY, C. Staten Island	403	577	1 i	1	0	0	0	0	0	1	0	0	0	0
Indiana State U.	403	3	2	1	0	0	0	0	0	0	0	0	0	1
All other surveyed institutions	-	139,674	140,872	0	0	0	0	0	0	0	0	0	0	0

i = imputed. na = not applicable; institution did not exist or did not exist as a separate entity. ne = not eligible; institution did not meet the criteria for inclusion.

nec = not elsewhere classified.

<sup>a</sup> Johns Hopkins University includes the Applied Physics Laboratory (APL), with \$1,047,002 thousand imputed for total R&D expenditures in engineering in FY 2019. Total expenditures by field for Johns Hopkins University are flagged as imputed because APL was unable to distribute a portion of institutionally funded R&D by field.

<sup>b</sup> The University of Maryland includes expenditures from the University of Maryland, Baltimore and University of Maryland, College Park campuses. In FY 2019, the two campuses began reporting as one research unit to reflect their new strategic partnership. This relationship was codified through the University of Maryland Strategic Partnership Act passed by the Maryland General Assembly in 2016. Prior to FY 2019, both campuses reported to the survey as separate institutions.

**Note(s):**

Institutions reporting zero expenditures in ranked total for FY 2019 are not listed in this table. Tied institutions are ranked alphabetically. Ranked institutions are geographically separate campuses headed by a campus-level president or chancellor. Some campuses are part of large, multi-campus universities; some are part of state university systems. For a complete list of campuses that belong to a larger university or system and their aggregate R&D expenditures, see table 6.

**Source(s):**

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