



Federal Obligations for S&E Support to HBCUs in FY 2018 Increase 3.8% from Previous Year

by Christopher Pece¹

Science and engineering (S&E) support to historically black colleges and universities (HBCUs) was \$320 million in FY 2018, an increase of 3.8% from FY 2017. This was the first increase HBCUs saw in 4 years, following annual declines in 2015, 2016, and 2017. Support to HBCUs for research and experimental development (R&D), the largest S&E component, was \$247 million in FY 2018, an increase of 5.4% from 2017 (table 1).

More broadly, in FY 2018, federal agencies obligated \$35.3 billion to higher education institutions in

support of S&E, which includes R&D and other S&E activities, up 8.8% from the \$32.4 billion obligated in FY 2017. In comparison, there was an increase of 2.5% from FY 2016 to FY 2017 (table 2).

These and other estimates in this InfoBrief are from the FY 2018 Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions (Federal S&E Support Survey), conducted by the National Center for Science and Engineering Statistics (NCSES) within the National Science Foundation (NSF).

S&E Support to Higher Education Institutions

Federal S&E support includes six categories: R&D; R&D plant; facilities and equipment for instruction in S&E; fellowships, traineeships, and training grants (FTTGs); general support for S&E; and other S&E activities (see definitions in “Data Sources and Limitations”). Twenty higher education institutions receiving the largest amounts of federal S&E support accounted for 36.2% of all S&E support obligations by the federal government (table 3). Out of the \$13 billion obligated to these 20 academic institutions to support S&E, 93.3% was for R&D, 4.1% for FTTGs, 2.1% for other S&E activities, and less than 1.0% for each of the following types of activities: R&D plant, general support for S&E, and facilities for instruction in S&E. These shares differ slightly from the ones for all other academic institutions. Of the \$23 billion obligated to all other academic institutions, 90.5% was for R&D, 4.4% for FTTGs, 2.6% for other S&E support activities, 2.1% for R&D plant, and less than 1% for facilities for instruction in S&E and for general support for S&E.

TABLE 1. Federal science and engineering obligations to HBCUs, by type of activity: FYs 2013–18 (Thousands of dollars)

Fiscal year	All federal obligations	R&D	R&D plant	Facilities and equipment for instruction in S&E	Fellowships, traineeships, and training grants	General support for S&E	Other S&E activities
2013	379,639	217,600	3,062	0	25,018	14,563	119,395
2014	408,387	241,643	10,116	0	66,131	16,247	74,250
2015	397,237	256,660	1,150	0	72,562	15,464	51,401
2016	372,978	257,894	2,210	0	56,529	5,166	51,180
2017	307,892	234,460	903	0	58,895	40	13,594
2018	319,684	247,103	1,412	0	60,786	95	10,289

HBCUs = historically black colleges and universities; S&E = science and engineering.

NOTE: Detail may not add to total due to rounding.

SOURCE: National Center for Science and Engineering Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions.

TABLE 2. Federal science and engineering obligations to all higher education institutions, by type of activity: FYs 2013–18
(Millions of dollars)

Fiscal year	All federal obligations	R&D	R&D plant	Facilities and equipment for instruction in S&E	Fellowships, traineeships, and training grants	General support for S&E	Other S&E activities
2013	29,407	26,156	273	4	894	132	1,948
2014	31,157	27,652	400	11	1,341	138	1,615
2015	30,561	27,105	371	4	1,347	138	1,596
2016	31,647	28,532	370	3	1,374	128	1,239
2017	32,440	29,805	432	3	1,371	96	732
2018	35,301	32,310	506	6	1,515	121	844

S&E = science and engineering.

NOTE: Detail may not add to total due to rounding.

SOURCE: National Center for Science and Engineering Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions.

TABLE 3. Federal science and engineering obligations to the 20 universities and colleges receiving the largest amounts, by type of activity: FY 2018
(Millions of dollars)

Institution	All federal obligations	R&D	R&D plant	Facilities and equipment for instruction in S&E	Fellowships, traineeships, and training grants	General support for S&E	Other S&E activities
All institutions	35,301	32,310	506	6	1,515	121	844
Top 20 institutions	12,788	11,932	29	0	520	41	266
Johns Hopkins U. ^a	1,822	1,753	0	0	37	1	30
U. Michigan	755	704	0	0	31	1	20
U. Washington	755	666	3	0	59	0	28
U. California, San Diego	684	636	5	0	19	6	17
U. California, San Francisco	672	617	0	0	32	2	21
Columbia U. in the City of New York	647	602	1	0	28	3	13
Stanford U.	621	576	0	0	29	5	11
U. Pittsburgh	600	558	0	0	22	4	16
U. Pennsylvania	584	541	2	0	37	0	5
Duke U.	578	544	2	0	16	1	16
U. Colorado Boulder	564	517	3	0	31	2	10
U. California, Los Angeles	544	510	0	0	25	2	8
Washington U., Saint Louis	523	485	1	0	21	4	12
U. North Carolina, Chapel Hill	517	476	0	0	25	0	16
Georgia Institute of Technology	501	485	4	0	6	0	6
Harvard U.	500	464	2	0	26	2	6
Yale U.	498	467	1	0	21	3	6
Pennsylvania State U.	485	459	5	0	14	1	7
U. Wisconsin-Madison	482	451	1	0	22	3	4
Northwestern U., Evanston	455	422	1	0	18	1	13
All other academic institutions	22,513	20,378	477	6	995	80	578

S&E = science and engineering.

^a Includes funding for Applied Physics Laboratory (\$992.8 million for S&E obligations, all of which was for R&D).

NOTE: Detail may not add to total because of rounding.

SOURCE: National Center for Science and Engineering Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions, FY 2018.

Six federal agencies accounted for 97.6% of all S&E support to higher education institutions in FY 2018: the Department of Health and Human Services (HHS), which includes the National Institutes of Health (\$20.7 billion), NSF (\$5.6 billion), the Department of Defense (DOD) (\$4.6 billion), the Department of Energy (DOE) (\$1.4 billion), the National Aeronautics and Space Administration (NASA) (\$1.1 billion), and the Department of Agriculture (USDA) (\$1.0 billion) (figure 1). Because obligations for

R&D are the single largest share of total S&E support, these six agencies also accounted for 97.6% of all federal R&D obligations to the academic sector (details available in table 8 in the full set of data tables).

S&E Support to Minority-Serving Institutions

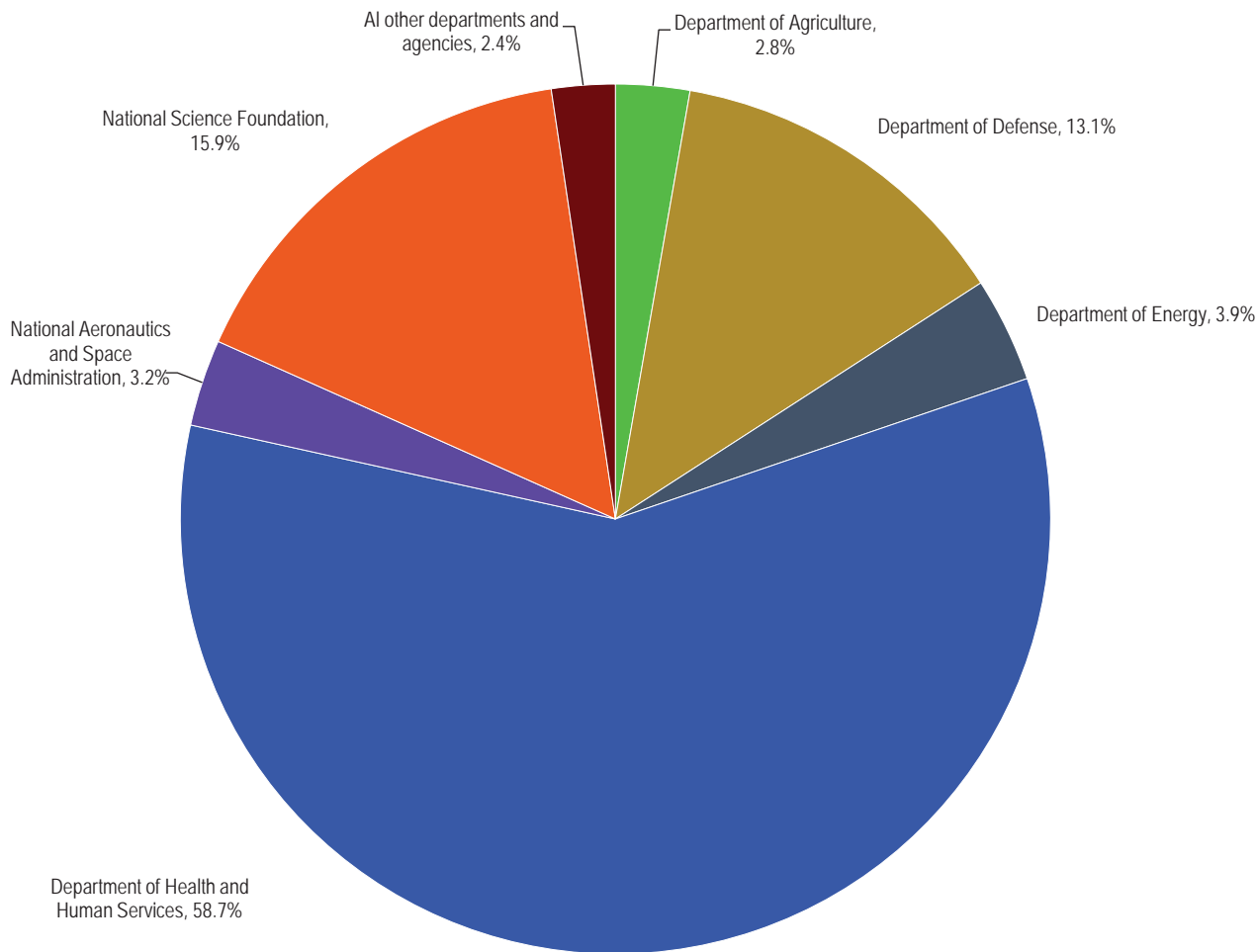
Historically Black Colleges and Universities

Fifty-seven of the 105 HBCUs² received federal obligations for S&E activities

in FY 2018, totaling \$320 million (table 4). FY 2018 marked the first increase in federal S&E obligations to HBCUs since FY 2014, when obligations rose 7.6% to \$408 million (table 1). In FY 2018, total R&D support to all HBCUs was \$247 million, a 5.4% increase from the \$234 million obligated in FY 2017.

The 20 HBCUs receiving the largest share of federal S&E support accounted for 74.9% of all S&E support obligations to HBCUs (table 4). These top 20 HBCUs also received 78.1% (\$193

FIGURE 1. Federal obligations for science and engineering to universities and colleges, by agency: FY 2018



SOURCE: National Center for Science and Engineering Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions, FY 2018.

TABLE 4. Federal science and engineering obligations to the 20 HBCUs receiving the largest amounts, by type of activity: FY 2018
(Thousands of dollars)

Institution	All federal obligations	R&D	R&D plant	Facilities and equipment for instruction in S&E	Fellowships, traineeships, and training grants	General support for S&E	Other S&E activities
All HBCUs	319,684	247,103	1,412	0	60,786	95	10,289
Top 20 HBCUs	239,488	192,937	1,412	0	38,881	95	6,163
North Carolina Agricultural and Technical State U.	24,231	20,872	0	0	3,170	0	189
Morehouse School of Medicine	19,587	18,408	0	0	327	0	852
Howard U.	18,839	13,772	299	0	4,549	0	219
Tuskegee U.	18,039	13,709	0	0	3,173	10	1,147
Meharry Medical C.	16,991	14,097	0	0	2,261	0	633
North Carolina Central U.	14,750	12,311	466	0	1,973	0	0
Tennessee State U.	12,393	8,915	0	0	3,243	0	235
Florida A&M U.	11,270	8,394	0	0	1,238	0	1,639
Xavier U., Louisiana	11,213	8,994	0	0	1,839	0	380
Delaware State U.	9,519	8,570	0	0	768	10	171
Jackson State U.	9,286	7,122	0	0	1,713	0	450
Prairie View A&M U.	9,197	7,861	0	0	1,087	0	249
Morgan State U.	9,062	6,845	0	0	2,217	0	*
Hampton U.	9,006	6,377	0	0	2,628	0	0
Alabama A&M U.	8,931	5,351	629	0	2,951	0	0
U. of the Virgin Islands	8,590	7,417	0	0	1,173	0	0
Norfolk State U.	8,584	7,543	18	0	1,023	0	0
Virginia State U.	7,543	6,541	0	0	927	75	0
Texas Southern U.	6,616	5,014	0	0	1,601	0	0
Clark Atlanta U.	5,844	4,824	0	0	1,020	0	0
All other HBCUs	80,196	54,166	0	0	21,905	0	4,126

* = amount > \$0 but < \$50.

HBCUs = historically black colleges and universities; S&E = science and engineering.

NOTE: Detail may not add to total because of rounding.

SOURCE: National Center for Science and Engineering Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions FY 2018.

million) of all federal obligations for R&D to HBCUs, 64.0% (\$39 million) of these obligations for FTTGs, and 100% of these obligations for both R&D plant and general support for S&E.

In FY 2018, five federal agencies—NSF, HHS, USDA, DOD, and DOE—accounted for 97.3% of all federal obligations for S&E support to HBCUs (table 5). NSF provided the most S&E support, accounting for \$102 million, or 32.1% of all federal S&E obligations to HBCUs. HHS obligated \$97 million in S&E support, or 30.3% of the total, and USDA followed with \$79 million, or 24.8% of all federal S&E support

to HBCUs. Obligations by DOD and by DOE accounted for 6.6% and 3.6%, respectively. In terms of R&D obligations to HBCUs, HHS leads all agencies with 34.0% of total R&D obligations to HBCUs (\$84 million), followed by USDA (\$68 million, or 27.5%), NSF (\$62 million, or 25.2%), DOD (\$19 million, or 7.7%), and DOE (\$11 million, or 4.6%) (details available in table 25 in the full set of data tables).

High-Hispanic-Enrollment Institutions

Among other minority-serving institutions, high-Hispanic-enrollment institutions (HHEs)³ received \$4.4 billion

in federal obligations for S&E support in FY 2018 (table 6). Federal support to HHEs for R&D amounted to \$4.0 billion, or 90.0% of total federal S&E support to HHEs. By comparison, R&D accounted for 77.3% of the S&E total obligations to HBCUs and for 91.5% of federal S&E support to all higher education institutions. The majority (59.9%) of the FY 2018 S&E support to HHEs came from HHS, with nearly \$2.7 billion in obligations. NSF was the second-leading federal agency to obligate funding to support S&E at HHEs, with nearly \$830 million (18.7%) (details available in table 26 in the full set of data tables).

TABLE 5. Federal science and engineering obligations to the 20 HBCUs receiving the largest amounts, by agency: FY 2018
(Thousands of dollars)

Institution	All agencies	DOD	DOE	ED	HHS	NASA	NSF	USDA	Other agencies ^a
All HBCUs	319,684	21,104	11,383	6,264	96,938	1,912	102,499	79,128	456
Top 20 HBCUs	239,488	16,289	11,383	2,399	87,905	1,877	76,234	43,006	395
North Carolina Agricultural and Technical State U.	24,231	2,168	2,960	0	1,817	0	9,273	8,012	0
Morehouse School of Medicine	19,587	852	0	0	18,735	0	0	0	0
Howard U.	18,839	964	0	0	7,682	56	10,012	0	125
Tuskegee U.	18,039	2,343	0	0	3,219	0	7,125	5,352	0
Meharry Medical C.	16,991	0	0	250	16,741	0	0	0	0
North Carolina Central U.	14,750	0	0	266	8,012	0	6,472	0	0
Tennessee State U.	12,393	228	0	235	1,468	0	3,115	7,077	270
Florida A&M U.	11,270	270	3,476	867	2,622	0	3,794	242	0
Xavier U., Louisiana	11,213	1,494	0	0	7,362	0	2,357	0	0
Delaware State U.	9,519	1,591	0	82	3,569	0	1,562	2,715	0
Jackson State U.	9,286	1,592	0	450	2,330	0	4,914	0	0
Prairie View A&M U.	9,197	0	0	249	112	211	1,800	6,825	0
Morgan State U.	9,062	150	0	0	5,240	689	2,983	0	0
Hampton U.	9,006	2,625	601	0	1,625	921	3,234	0	0
Alabama A&M U.	8,931	676	0	0	0	0	2,702	5,553	0
U. of the Virgin Islands	8,590	15	0	0	554	0	6,304	1,717	0
Norfolk State U.	8,584	721	4,345	0	0	0	3,518	0	0
Virginia State U.	7,543	0	0	0	0	0	2,029	5,514	0
Texas Southern U.	6,616	0	0	0	3,223	0	3,392	0	0
Clark Atlanta U.	5,844	600	0	0	3,595	0	1,649	0	0
All other HBCUs	80,196	4,815	0	3,865	9,033	35	26,265	36,122	62

DOD = Department of Defense; DOE = Department of Energy; ED = Department of Education; HBCUs = historically black colleges and universities; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; USDA = Department of Agriculture.

^a Includes data for the following agencies: the Departments of Commerce, Homeland Security, the Interior, and Transportation and the Social Security Administration.

NOTE: Detail may not add to total because of rounding.

SOURCE: National Center for Science and Engineering Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions, FY 2018.

R&D Support to Nonprofit Institutions

NCSES collects statistics on federal obligations to independent nonprofit institutions for two of the six S&E support categories, namely, R&D and R&D plant. During FY 2018, federal agencies obligated \$7.3 billion in R&D and R&D plant to 922 nonprofit institutions (table 7). The Patient-Centered Outcomes Research Institute received the most in federal funds for R&D and R&D plant (\$492 million).

Data Sources and Limitations

Data in this InfoBrief were not adjusted for inflation. Data were obtained from the 20 agencies (12

federal departments and 8 independent agencies) that made S&E obligations to academic and nonprofit institutions in FY 2018, as reported to the Federal S&E Support Survey. The survey collects federal S&E support data by funding agency, institution, type of activity, type of institution, and geographic location.

The six funding categories of federal S&E support are defined as follows:

- *Research and experimental development* includes all direct, indirect, incidental, or related costs resulting from or necessary to perform R&D by private individuals and organizations under grant, contract, or cooperative agreement.
- *R&D plant* includes all projects whose principal purpose is to provide support for construction, acquisition, renovation, modification, repair, or rental of facilities, land, works, or fixed equipment for use in scientific or engineering R&D.
- *Facilities and equipment for S&E instruction* includes all programs whose principal purpose is to provide support for construction, acquisition, renovation, modification, repair, or rental of facilities, land, works, or equipment for use in instruction in S&E.
- *Fellowships, traineeships, and training grants* includes all fellowship, traineeship, and training grant

TABLE 6. Federal obligations for science and engineering to high-Hispanic-enrollment institutions, ranked by total amount received, by type of activity: FY 2018
(Thousands of dollars)

Institution	All federal obligations	R&D	R&D plant	Facilities and equipment for instruction in S&E	Fellowships, traineeships, and training grants	General support for S&E	Other S&E activities
All HHEs	4,442,397	3,998,042	94,759	0	209,415	22,981	117,201
Top 20 HHEs	3,881,599	3,550,757	87,948	0	132,924	19,748	90,223
U. California, San Diego ^a	683,250	635,718	4,559	0	19,445	6,305	17,223
U. California, Los Angeles	544,389	509,919	9	0	24,556	1,736	8,170
U. Texas, Austin	360,615	284,126	62,266	0	10,132	0	4,090
U. California, Davis	353,263	331,185	560	0	10,139	1,639	9,741
U. Colorado Boulder ^a	246,152	224,313	0	0	11,485	501	9,853
U. Arizona	238,551	214,445	2,880	0	12,218	600	8,409
U. California, Irvine	228,918	221,670	400	0	5,691	0	1,157
U. Miami ^a	166,547	160,221	0	0	3,074	0	3,252
U. Illinois, Chicago	161,943	145,678	1,013	0	5,399	0	9,853
U. Texas M. D. Anderson Cancer Center	151,198	141,562	0	0	2,580	1,197	5,860
U. New Mexico	114,559	102,284	2,085	0	6,228	0	3,961
U. California, Santa Barbara	108,407	105,293	1,842	0	1,273	0	0
U. Texas Health Science Center, Houston ^a	91,463	88,944	0	0	2,498	0	21
U. Texas Health Science Center, San Antonio	87,621	77,225	0	0	3,843	0	6,553
U. California, Riverside	78,246	74,820	599	0	2,568	0	260
U. Central Florida	71,791	71,145	0	0	362	0	284
U. California, Santa Cruz	59,752	51,180	2,809	0	2,712	3,044	6
Florida International U.	59,558	48,432	1,042	0	4,619	4,292	1,174
New Mexico State U., Las Cruces	40,430	36,245	83	0	3,307	435	360
U. Puerto Rico, Medical Sciences Campus	34,949	26,354	7,800	0	795	0	0
All other HHE institutions	560,799	447,285	6,812	0	76,491	3,233	26,978

HHEs = high-Hispanic-enrollment institutions; S&E = science and engineering.

^a Excludes obligations for the university's foundation or auxiliary organization or some campuses or branches because those are not HHE institutions.

NOTES: Detail may not add to total because of rounding. Institution order is based on total actual dollars received before amounts are rounded. Only those agencies that had obligations in the variables represented by this table appear in the table. This list of HHE institutions includes those institutions of higher education whose full-time equivalent (FTE) enrollment of undergraduate students is at least 25% Hispanic, according to fall 2018 enrollment data self-reported by the institutions in the Integrated Postsecondary Education Data System survey conducted by the National Center for Education Statistics (NCES). NCES determined FTE enrollment by calculating that approximately three part-time students are equivalent to one full-time student.

SOURCE: National Center for Science and Engineering Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions FY 2018.

programs that are directed primarily toward the development and maintenance of the scientific workforce.

- *General support for S&E* includes funds used for scientific projects and support for activities within a specified discipline; explicit purpose is not specified.

- *Other S&E activities* includes all academic S&E obligations that cannot be assigned elsewhere and activities in support of technical conferences, teacher institutes, and programs aimed at increasing precollege and undergraduate students' scientific knowledge.

The full set of data tables on the FY 2018 Federal S&E Support Survey are available at <https://www.nsf.gov/statistics/srvyfedsupport/>. Data for the survey are available in NCSES's interactive data tool (<https://ncesdata.nsf.gov/ids/fss>). For more information, please contact the author.

TABLE 7. Federal research and development and R&D plant obligations to the 10 independent nonprofit institutions receiving the largest amounts, by agency: FY 2018
(Thousands of dollars)

Institution	All federal obligations	HHS	DOD	NSF	NASA	DOE	Other agencies ^a
All institutions	7,274,293	4,924,365	930,295	330,568	258,876	112,753	717,436
Top 10 nonprofit institutions	2,904,440	1,793,841	493,085	100,861	3,481	15,250	497,923
Patient-Centered Outcomes Research Institute	491,715	0	0	0	0	0	491,715
Massachusetts General Hospital	465,109	451,964	12,552	364	230	0	0
Brigham and Women's Hospital	370,959	368,718	1,358	406	477	0	0
Fred Hutchinson Cancer Research Center	305,891	304,817	927	147	0	0	0
Battelle Memorial Institute, all locations	298,469	25,057	177,978	80,958	169	14,034	274
Mayo Clinic	272,133	261,156	10,441	536	0	0	0
Henry M. Jackson Foundation for the Advancement of Military Medicine	223,301	17,995	205,306	0	0	0	0
Dana-Farber Cancer Institute	169,423	167,882	63	264	0	1,215	0
Children's Hospital Boston	155,956	155,801	0	155	0	0	0
SRI International	151,485	40,452	84,461	18,032	2,606	0	5,935
All other nonprofit institutions	4,369,852	3,130,525	437,210	229,707	255,395	97,503	219,513

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.

^a Includes data for the following agencies: the Departments of Commerce, Education, Homeland Security, Housing and Urban Development, the Interior, Justice, Labor, and Transportation; the Agency for International Development; the Environmental Protection Agency; the Appalachian Regional Commission; the Nuclear Regulatory Commission; Patient-Centered Outcomes Research Trust Fund; and the Social Security Administration.

NOTE: Detail may not add to total due to rounding.

SOURCE: National Center for Science and Engineering Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions, FY 2018.

Notes

1. Christopher Pece, Research and Development Statistics Program, National Center for Science and Engineering Statistics, National Science Foundation, 2415 Eisenhower Avenue, Suite W14200, Alexandria, VA 22314 (cpece@nsf.gov; 703-292-7788).

2. The Higher Education Act of 1965, as amended, defines an HBCU as “any historically black college or university that was established prior to 1964,

whose principal mission was, and is, the education of black Americans, and that is accredited by a nationally recognized accrediting agency or association determined by the Secretary (of Education) to be a reliable authority as to the quality of training offered or is, according to such an agency or association, making reasonable progress toward accreditation.”

3. HHEs are those institutions whose full-time equivalent (FTE) enrollment of undergraduate students is at least

25% Hispanic, according to fall 2018 enrollment data self-reported by the institutions in the Integrated Postsecondary Education Data System survey conducted by the National Center for Education Statistics (NCES). NCES determined FTE enrollment by calculating that approximately three part-time students are equivalent to one full-time student.