



Historically Black Colleges and Universities (HBCUs): Remains Underfunded

SIGMA XI National Institute of Standards and Technology

Annual Banquet

The Willow Tree End, Gaithersburg, MD
May 13, 2004

Robert Louis Shepard, Ph.D.
Executive Director
Science and Engineering Alliance, Inc. (SEA)



“In Search of a Resolution for Increasing the Participation of Underrepresented Groups in NSF Programs”

National Science Foundation

**Biological Sciences Directorate
Broadening Participation Workshop**

**Arlington, VA
June 23, 2005**

**Robert Louis Shepard, Ph.D.
Executive Director
Science and Engineering Alliance, Inc. (SEA)**

What will be Discussed



- ❑ Legacy of Traditional White Institutions (TWIs)
- ❑ Legacy of Historically Black Colleges and Universities (HBCUs)
- ❑ Definition of an HBCU
- ❑ Myths and Misunderstandings surrounding HBCUs
- ❑ Productivity of HBCUs
- ❑ HBCUs Remain Underfunded

What is an Historically Black College and University (HBCU)?



HBCUs are institutions founded before **1964** for the purpose of educating Black Americans.

SOURCE: U.S. Department of Education

What is an Historically Black College and University (HBCU)?



Conditions under which HBCUs were founded are unparalleled:

- ❑ Legal segregation
- ❑ Created to serve a population that was under legal, social, economic and political constraints

What is an Historically Black College and University (HBCU)?



Operate on small budgets, limited by:

- ❑ Students' ability to pay tuition and small charitable donations -- **Private HBCUs**
- ❑ State Appropriations (assistance) -- **Public HBCUs (includes 18 Federal 1890 Land Grant Institutions)**

What is an Historically Black College and University (HBCU)?



102 in 19 states, DC & U.S. Virgin Islands:

- ❑ **51 Public**, State Supported (**assisted**),
e.g., Prairie View A&M University
(**18 are Federal 1890 Land Grant Institutions**)
- ❑ **51 Private**, Religious Denomination
e.g., Xavier University (**Roman Catholic**)

What is an Historically Black College and University (HBCU)?



37 of the **Private Institutions** are members of the United Negro College Fund (UNCF)

What is an Historically Black College and University (HBCU)?



HBCUs:

- ❑ ~ 2.4% of America's 4,300 IHL
- ❑ ~ Enroll 1.5% of ALL college students in America (298,000)
- ❑ ~ 79% of the students are African American (235,000)

SOURCE: NCES, Digest of Education Statistics, 2017



Often Held Discussions:

“Why is there **limited response from HBCUs** to Federal and private opportunities described in Request for Proposals (RFPs), Statements of Work (SOW), Request for Quotations (RFQs) or Broad Agency Announcements (BAAs)?”



Speculation is wide-spread:

- ❑ Does not reach the right person
- ❑ May be lost in the mail
- ❑ Reaches right person, but is not understood
- ❑ Simply No Interest



Leads to These Results:

- ❑ **HBCUs** are not capable
- ❑ **HBCUs** are not interested
- ❑ **HBCUs** cannot participate
- ❑ Etc...Etc...Etc...
- ❑ Raises questions about the **Quality of HBCU Students**

HBCU Legacy: A Lifetime of Struggle for Survival With Limited HELP



Shepard's Speculation: “Historically Black Colleges and Universities (HBCUs) in America have NEVER been afforded enough help, especially financial resources and continue to operate with TOO LITTLE.”

FDR's Second Inaugural Address - One Third of a Nation:

“The test of our progress is not whether we add more to the abundance of those who have much, it is whether we provide enough for those who have little.”

-- Franklin D. Roosevelt

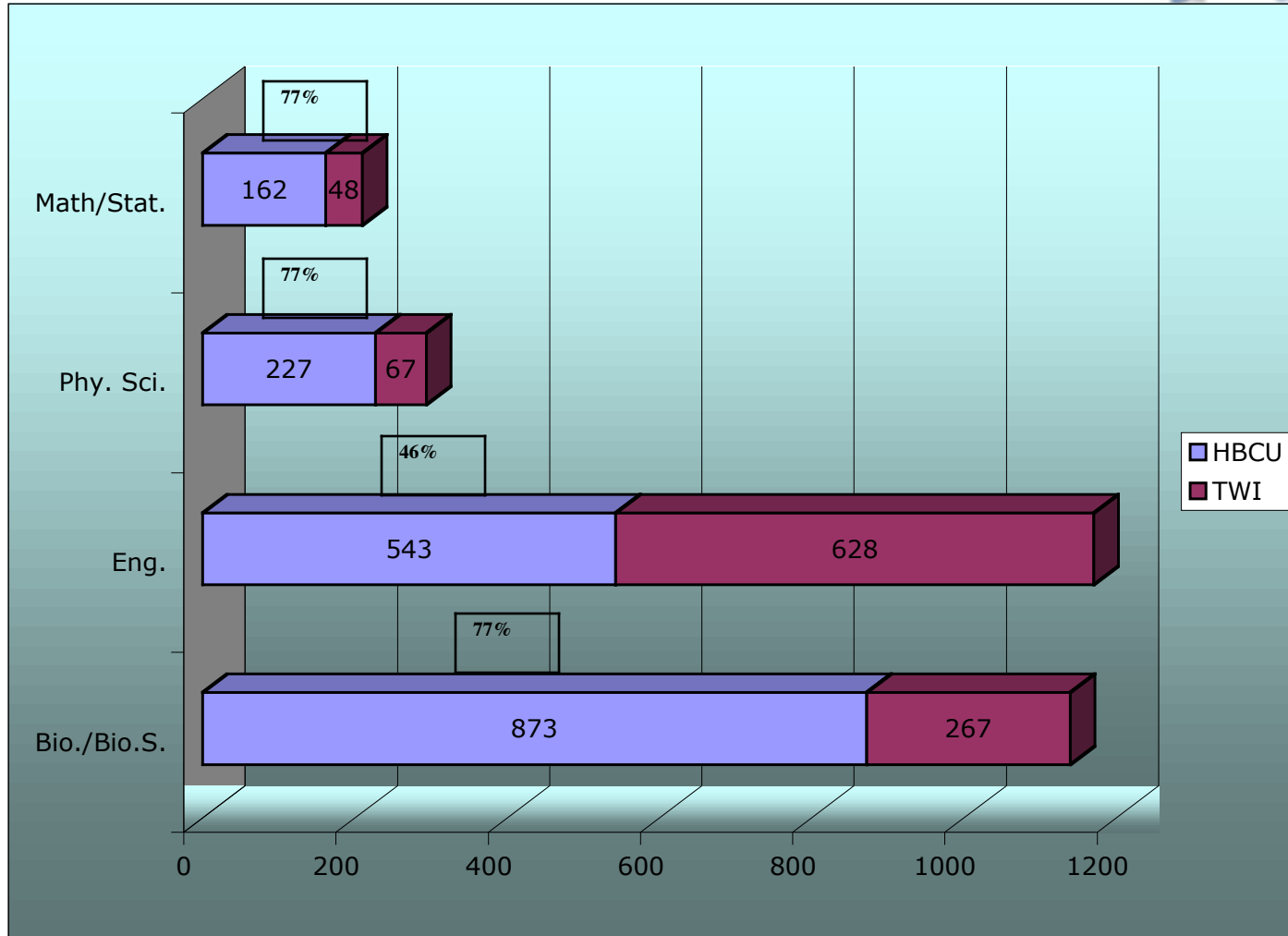
Source: Franklin D. Roosevelt, Inaugural Address, January 20, 1937

Productivity of HBCUs at the Undergraduate Level



What about the productivity of HBCUs at the Undergraduate Level?

Comparing the Top 50 Institutions Relative to Type, HBCUs Play a Vital Role in the Education of African Americans with BS Degrees in STEM (2003-2004)



SOURCE: <http://www.blackissues.com/Top100Home.asp>, June 2, 2005

Of the Top **20** Institutions Graduating African American Engineers,
46% of the BS Degrees Were Obtained **8** HBCUs (2003-2004)



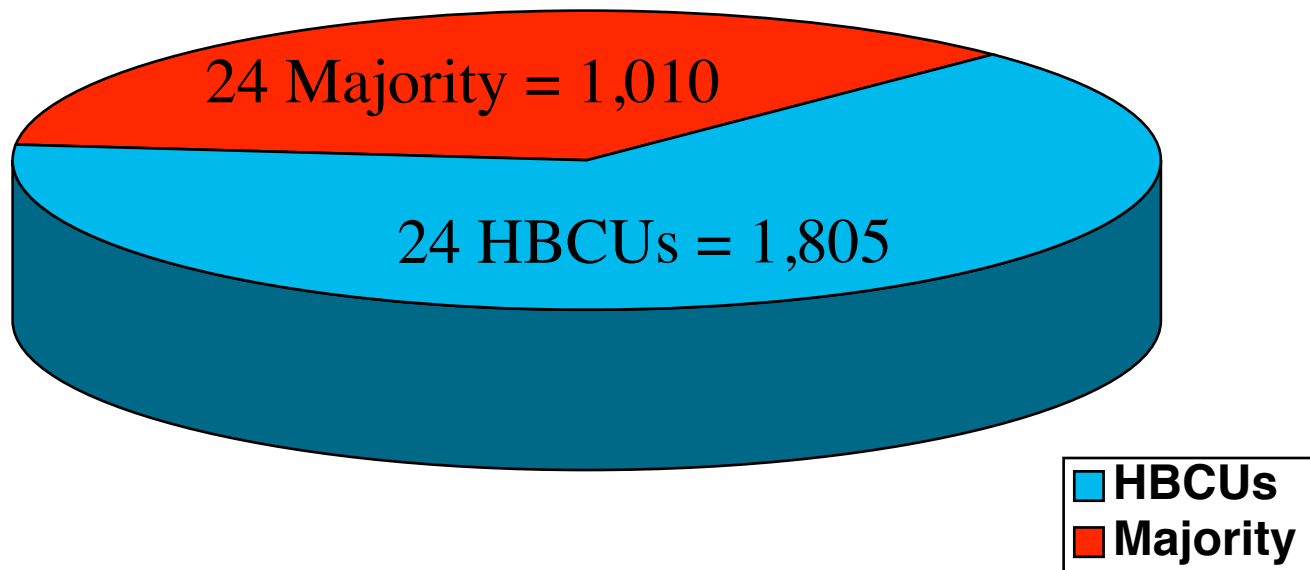
Total Degrees = 1171

Total Granted by HBCUs = 543

NCATSU	= 110
TSU	= 102
FAMU	= 81
MSU	= 64
TUSKU	= 62
SUBR	= 48
PVAMU	= 38
HU	= <u>38</u>
Total	= 543

SOURCE: <http://www.blackissues.com/Top100Home.asp>, June 2, 2005

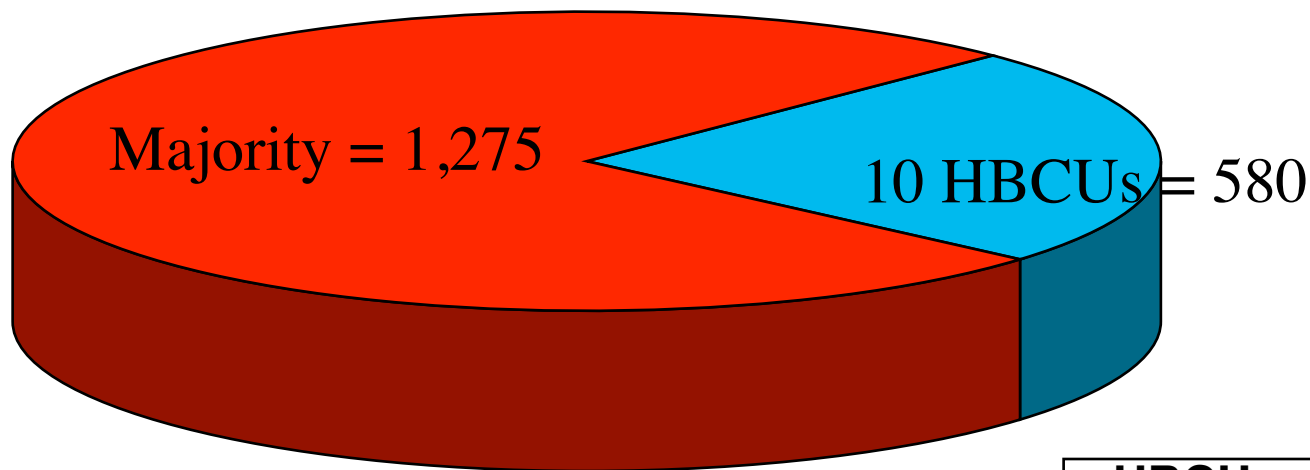
Of the Top 50 Institutions Graduating the Greatest Number of African American STEM Undergraduates, **24 HBCUs** Accounted for ~ 64% of the Graduates, 2003-2004



SOURCE: <http://www.blackissues.com/Top100Home.asp>, June 2, 2005

Of the Top 100 Institutions Graduating the Greatest Number of *Black American Undergraduates in Engineering in 2007*

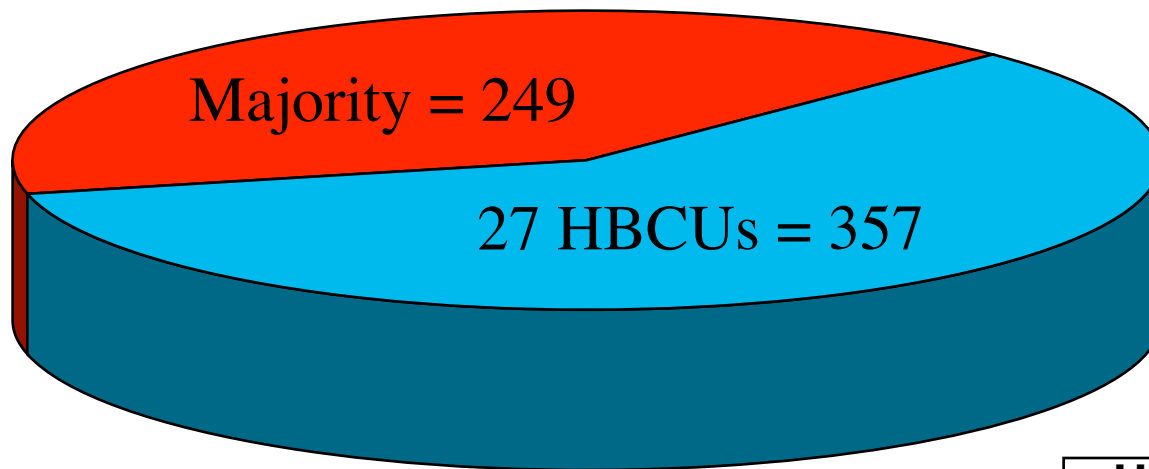
~~10 HBCUs Accounted for 31% of the Graduates~~



- | | |
|----------|--------|
| NCA&T | MSU |
| SUBR | How. U |
| FAMU | AAMU |
| PVAMU | TSU |
| Tusk. U. | CAU |

SOURCE: <http://www.diverseeducation.com/Top100DegreeProducers2007undergraduate.asp>, 2007

Of the Top 100 Institutions Graduating the Greatest Number of *Black American Undergraduates in Physical Science* in 2007, **27 HBCUs Accounted for 60% of the Graduates**

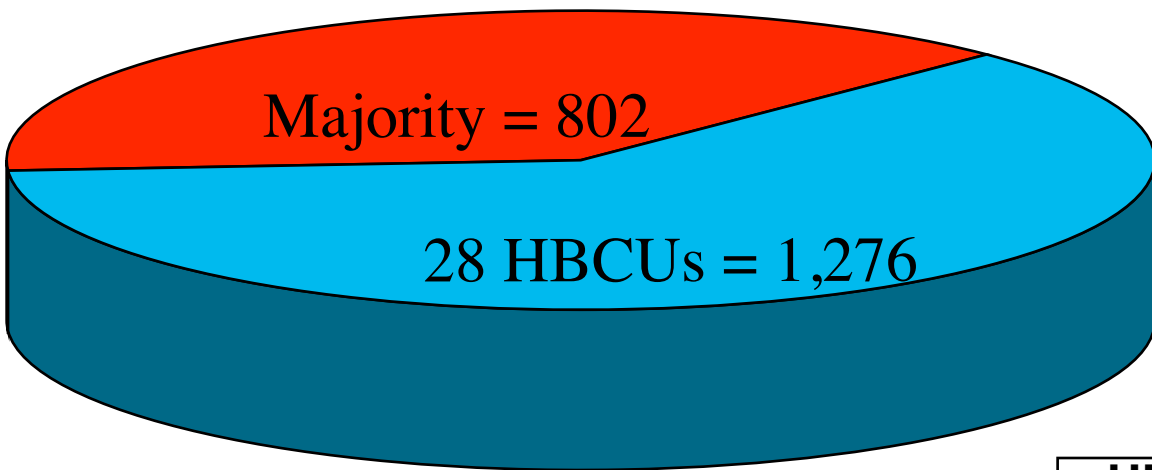


- | | | | |
|-------------|------------|----------|---------|
| Xav. U | LU Pen | Savn. SU | DU |
| FAMU | Bened. C. | Hamp. U | JCC |
| More. C | SCSU | MSU | VSU |
| TNSU | JSU | WSSU | CAU |
| SUBR | NSU | ASU | UAPB |
| How. U | Toug. C. | DSU | Tusk. U |
| Spel. C | TXSU | GSU | |



SOURCE: <http://www.diverseeducation.com/Top100DegreeProducers2007undergraduate.asp>, 2007

Of the Top 100 Institutions Graduating the Greatest Number of *Black American Undergraduates in Biological and Biomedical Sciences in 2007, 28 HBCUs Accounted for 61% of the Graduates*

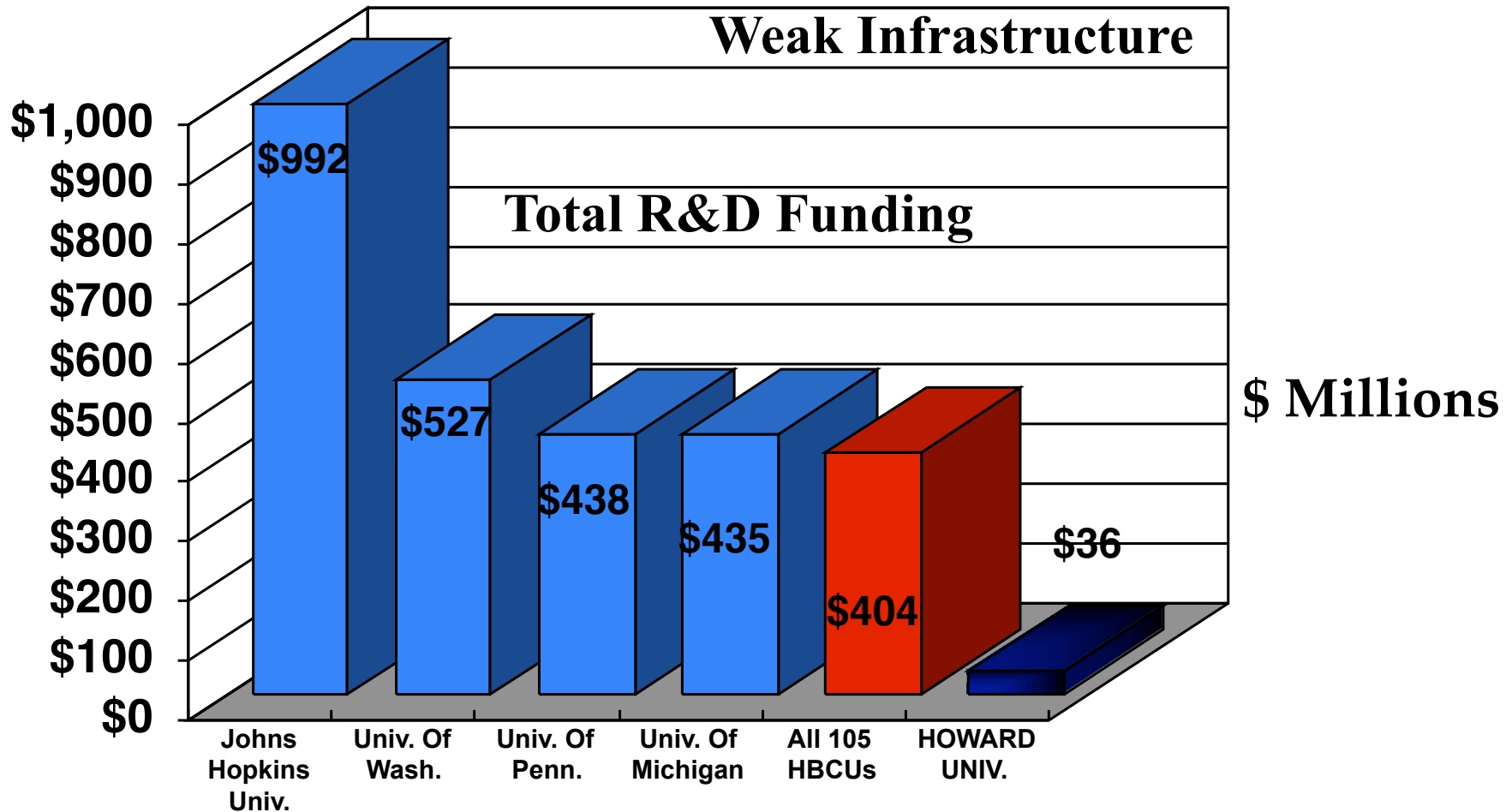


■ HBCUs
■ Majority

- | | | | |
|--------------|-------------|----------|-----------|
| Xav. U | TNSU | Tusk. U. | More. C. |
| How. U | TXSU | WSSU | MSU |
| JSU | AAMU | CAU | FVSU |
| Hamp. U | DU | UMES | Bened. C. |
| Spel. C. | SUBR | NCCU | AlaSU |
| PVAMU | ASU | Oak. C. | VSU |
| SCSU | FAMU | FSU | AlbSU |

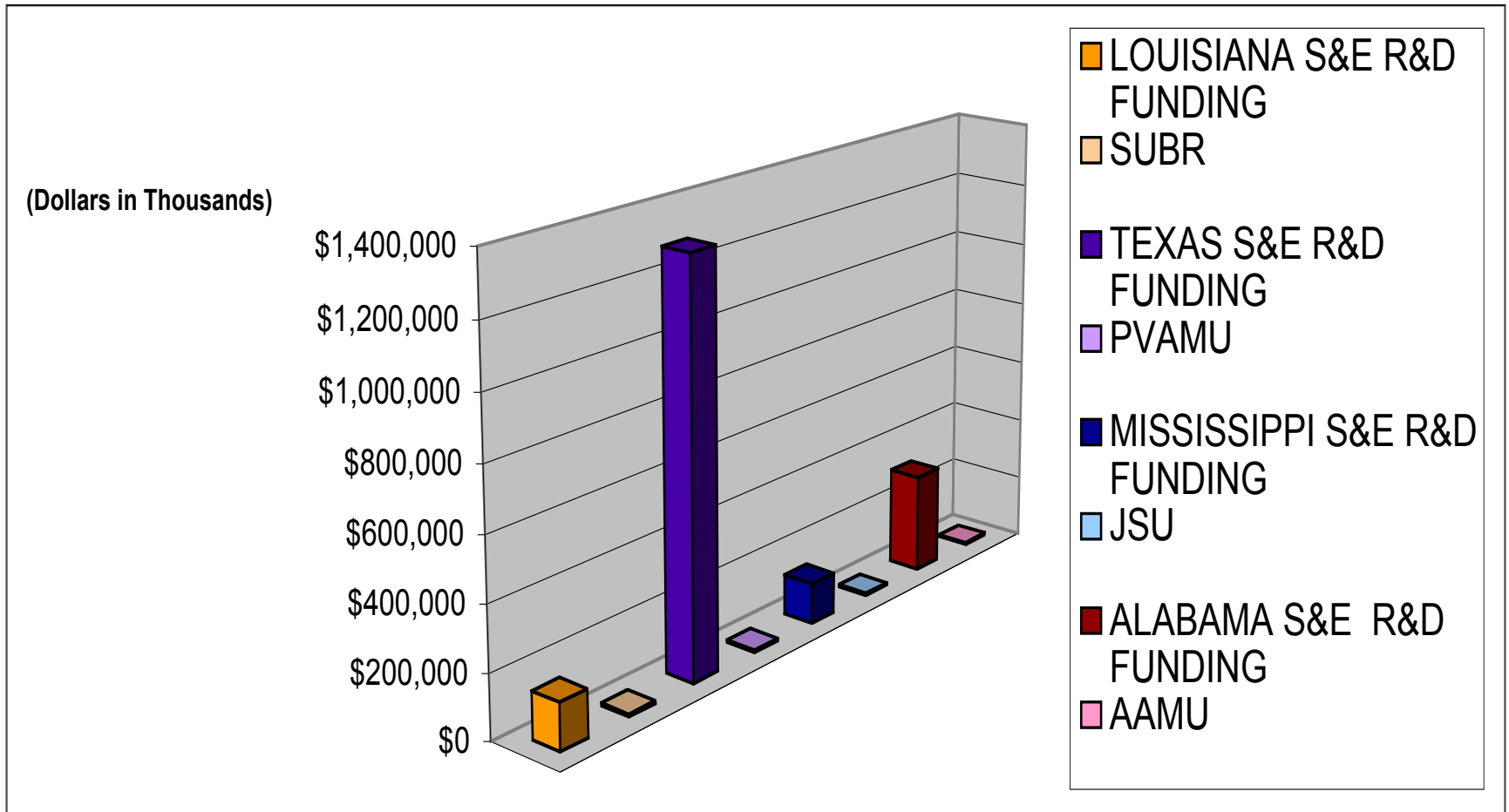
SOURCE: <http://www.diverseeducation.com/Top100DegreeProducers2007undergraduate.asp>, 2007

Shepard's Theory: HBCUs Struggle to Respond Because of Limited Financial Resources



SOURCE: National Science Foundation, 2001

S&E R&D Funding by States vs Some State HBCUs (Fiscal Year 2001)



Sources: <http://www.nsf.gov/sbe/srs/nsf03326/pdf/fssb15.pdf>

HBCUs Continue their Struggle to Survive Because of Limited Financial Support from All Sources



“The test of our progress is not whether we add more to the abundance of those who have much, it is whether we provide enough for those who have little” -- Franklin D. Roosevelt

Institution	Federal	State & Local Govt.	Industry	Institutional Support	All Other Sources	All R&D Funds
	(Dollars in thousands)					
1 Johns Hopkins U.	1,307,453	5,830	25,162	69,960	91,572	1,499,977
2 U. WA	650,394	8,969	56,765	43,388	18,632	778,148
3 U. MI all campuses	565,739	9,522	32,275	153,410	39,542	800,488
4 Stanford U.	540,069	4,595	34,637	40,742	59,153	679,196
5 U. WI Madison	491,810	31,181	20,310	223,832	64,762	831,895
6 U. CA, Los Angeles	483,873	14,984	24,480	162,219	125,937	811,493
7 U. PA	478,773	6,564	38,347	64,229	88,139	676,052
8 MA Institute of Technology	476,362	681	75,790	10,576	37,339	600,748
9 U. CA, San Francisco	464,660	26,804	35,621	129,527	139,537	796,149
10 U. CA, San Diego	463,807	25,758	39,825	124,987	100,389	754,766
11 Columbia U. in the City of NY	451,187	12,511	5,708	42,615	17,924	529,945
12 U. CO all campuses	448,350	2,255	11,491	28,751	21,947	512,794
13 U. Pittsburgh all campuses	422,316	13,415	8,670	61,815	23,947	530,163
14 Duke U.	414,419	17,906	132,996	69,103	22,656	657,080
15 Washington U. St. Louis	408,402	14,946	14,081	71,936	38,309	547,674
16 Harvard U.	403,458	915	6,155	0	42,628	453,156
17 Cornell U. all campuses	390,043	64,411	20,369	128,118	45,861	648,802
	8,861,115	261,247	582,682	1,425,208	978,274	12,108,526
ALL 105 HBCUs Combined	368,198	21,475	11,488	29,366	8,141	438,668
Howard University	34,959	344	1,162	0	0	36,465
Jackson State University	30,783	0	918	6,572	0	38,273

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Research and Development Expenditures at Universities and Colleges, FY 2006.

What Next?



Fulfill FDR's Statement made January 20, 1937

“The test of our progress is not whether we add more to the abundance of those who have much, it is whether we provide enough for those who have little.”

-- Franklin D. Roosevelt

Resource Information



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Federal Science and Engineering Obligations to Academic Institutions Increase 2%; Support to HBCUs Declines 17%

by Christopher Pece¹

In FY 2017, federal agencies obligated \$32.4 billion to institutions of higher education in support of science and engineering (S&E), up 2% from the \$31.6 billion obligated in FY 2016. Funding for research and development to universities and colleges increased 4% to \$29.8 billion (table 1). Meanwhile, total S&E support to historically black colleges and universities (HBCUs) declined for the third year in a row, to \$308 million, down 17% from FY 2016, and support to HBCUs for R&D declined 9% (table 2). (Unless otherwise noted, amounts for FY 2017 obligations and comparisons with previous years are in current dollars.) These and other estimates in this InfoBrief are from the FY 2017 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).

After adjusting for inflation, federal S&E obligations to academic institutions increased 1% in FY 2017, following a 2% increase in FY 2016. Similarly, inflation-adjusted R&D obligations rose 3% in FY 2017,

following a 4% increase in FY 2016. Inflation-adjusted obligations for all S&E support to HBCUs declined

19% in FY 2017, having previously declined 7% in FY 2016. Inflation-adjusted R&D support to HBCUs

TABLE 1. Federal science and engineering obligations, by type of activity: FYs 2009–17

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
Current \$millions							
2009 ^a	35,874	32,081	806	5	968	245	1,769
2010 ^a	35,942	30,999	1,831	6	1,137	361	1,609
2011	31,760	28,202	330	4	1,016	208	2,000
2012	31,216	27,700	437	4	914	142	2,019
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	28,531	370	4	1,374	128	1,239
2017	32,431	29,796	432	3	1,371	96	732
Constant FY 2012 \$millions							
2009 ^a	37,600	33,624	845	5	1,015	257	1,854
2010 ^a	37,342	32,207	1,902	6	1,181	375	1,672
2011	32,339	28,716	336	4	1,035	212	2,036
2012	31,216	27,700	437	4	914	142	2,019
2013	28,918	25,721	268	4	879	130	1,916
2014	30,092	26,707	386	11	1,295	133	1,560
2015	29,164	25,866	354	4	1,285	132	1,523
2016	29,881	26,939	349	4	1,297	121	1,170
2017	30,079	27,635	401	3	1,272	89	679

S&E = science and engineering.

^a Includes American Recovery and Reinvestment Act of 2009 obligations.

NOTES: Gross domestic product implicit price deflators were used to convert current to constant dollars. Detail may not sum to total due to rounding.

SOURCE: National Science Foundation, 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 HBCUs, by type of activity: FYs 2009–17

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
Current \$millions							
2009 ^a	458	265	3	0	28	23	139
2010 ^a	497	282	31	0	40	19	125
2011	448	258	1	0	32	22	135
2012	400	232	3	0	27	15	123
2013	380	218	3	0	25	15	119
2014	408	242	10	0	66	16	74
2015	397	257	1	0	73	15	51
2016	373	258	2	0	57	5	51
2017	308	234	1	0	59	0	14
Constant FY 2012 \$millions							
2009 ^a	480	278	3	0	29	24	146
2010 ^a	516	293	32	0	42	20	130
2011	456	263	1	0	33	22	137
2012	400	232	3	0	27	15	123
2013	374	214	3	0	25	15	117
2014	394	234	10	0	64	15	71
2015	379	245	1	0	70	14	49
2016	352	243	2	0	54	5	48
2017	285	217	1	0	55	0	13

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

^a Includes American Recovery and Reinvestment Act of 2009 obligations.

NOTES: Gross domestic product implicit price deflators were used to convert current to constant dollars. Detail may not sum to total due to rounding.

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

declined 11% in FY 2017, following a 1% decline in FY 2016.

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 37% of all S&E support obligations by the federal government (table 3). For these 20 academic institutions, 94% of all federal FY 2017 S&E obligations

were for R&D, 4% were directed toward FTTGs, 2% for other S&E activities, and less than 1% for R&D plant. These shares slightly differ from those for all other academic institutions where 91% of all S&E obligations are directed toward R&D, 5% toward FTTGs, 2% for other S&E support activities, and 2% for R&D plant.

Six federal agencies accounted for 97% of all S&E support to higher education institutions in FY 2017: the Department of Health and Human Services (HHS), which includes the National Institutes of Health (59%), NSF (17%), the Department of Defense (DOD) (13%), the National Aeronautics and Space Administration (NASA) (3%),

Department of Energy (DOE) (3%), and the Department of Agriculture (USDA) (3%) (table 4). Because obligations for R&D are the single largest share of total S&E support, these six agencies also accounted for most of the federal R&D obligations to the academic sector: HHS (61%), NSF (15%), DOD (12%), NASA (4%), USDA (3%), and DOE (3%) (details available in table 19 in the full set of data tables).

S&E Support to Minority-Serving Institutions

Historically Black Colleges and Universities

Sixty-three of the 105 HBCUs² received federal obligations for some type of

TABLE 3. Federal science and engineering obligations to the 20 universities and colleges receiving the largest amounts, by type of activity:
FY 2017
(Thousands of dollars)

Institution	All federal obligations	R&D	R&D plant	Facilities for instruction in S&E	Fellowships, traineeships, and training grants	General support for S&E	Other S&E activities
All institutions	32,430,792	29,796,361	431,665	3,131	1,371,419	96,438	731,778
Top 20 institutions	11,840,626	11,121,944	27,614	0	428,253	34,848	227,967
Johns Hopkins U. ^a	1,708,000	1,658,299	13	0	31,667	745	17,278
U. Michigan	700,050	656,721	2,521	0	25,272	631	14,905
U. Washington	667,400	612,729	1,970	0	28,189	4,779	19,734
U. California, San Diego	639,089	586,657	6,068	0	20,107	11,660	14,598
U. California, San Francisco	628,270	573,522	0	0	28,982	1,131	24,635
Stanford U.	581,148	550,247	93	0	23,331	980	6,496
Columbia U. in the City of New York	574,306	534,659	253	0	21,921	1,161	16,313
U. Pennsylvania	552,306	509,277	919	0	33,530	2,832	5,748
U. Pittsburgh	544,466	503,566	616	0	20,115	1,629	18,540
Duke U.	523,037	490,343	4,900	0	15,567	348	11,880
U. California, Los Angeles	522,729	492,364	531	0	22,550	106	7,178
Harvard U.	490,075	447,531	108	0	25,743	0	16,693
U. Wisconsin-Madison	485,333	453,756	779	0	25,463	226	5,109
U. Colorado Boulder	481,184	442,173	1,818	0	17,926	2,698	16,570
Washington U., Saint Louis	476,403	447,831	3	0	19,884	2,546	6,139
Georgia Institute of Technology	473,320	465,721	1,009	0	3,705	0	2,885
U. North Carolina, Chapel Hill	460,652	430,254	452	0	25,540	835	3,572
Yale U.	460,097	431,569	699	0	20,001	570	7,258
Pennsylvania State U.	450,200	428,910	4,828	0	12,935	966	2,561
U. Southern California	422,562	405,815	36	0	5,827	1,008	9,876
All other academic institutions	20,590,166	18,674,417	404,052	3,131	943,166	61,590	503,811

S&E = science and engineering.

^a Includes funding for Applied Physics Laboratory (\$947.4 million for S&E obligations, of which \$947.4 million was for R&D).

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

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions, FY 2017.

S&E activities in FY 2017, totaling \$308 million (table 5). FY 2017 marked the third year in a row of decreasing S&E obligations to HBCUs, down 17% from FY 2016 and down by one-fourth, or \$100 million, from the \$408 million obligated in FY 2014 (table 2). In FY 2017, total R&D support to all HBCUs was \$234 million, a 9% decrease from the \$258 million obligated in FY 2016.

The 20 HBCUs receiving the largest share of federal S&E support accounted for 72% of all S&E support obligations to all HBCUs. These 20 HBCUs

received 77% (\$181 million) of all federal obligations for R&D to all HBCUs. FTTGs to these same 20 institutions account for 64% (\$38 million) of all FTTGs to all HBCUs, and 100% (\$40 million) of general support for S&E to all HBCUs.

In FY 2017, five federal agencies accounted for 92% of all federal obligations for S&E support to HBCUs (table 6). HHS provided the most S&E support, accounting for \$98 million, or 32% of all federal HBCU obligations. NSF provided \$79 million in

S&E support, or 26% of the total, and USDA followed with \$75 million, or 24% of all federal S&E support to HBCUs. Obligations by DOD and by the Department of Education (ED) accounted for 6% and 5%, respectively. In terms of R&D support to HBCUs, HHS leads all agencies with 37% of total R&D obligations to HBCUs (\$87 million), followed by USDA (\$70 million, or 30%), NSF (\$36 million, or 15%), DOD (\$15 million, or 7%), DOE (\$13 million, or 6%), and NASA (\$5 million, or 2%) (details available in table 25 in the full set of data tables).

TABLE 4. Federal science and engineering obligations to the 20 universities and colleges receiving the largest amounts, by agency: FY 2017
(Thousands of dollars)

Institution	All federal obligations	DOD	DOE	HHS	NASA	NSF	USDA	Other agencies ^a
All institutions	32,430,792	4,170,293	995,109	19,051,676	1,101,811	5,358,732	941,046	812,126
Top 20 institutions	11,840,626	2,189,578	233,753	7,803,104	367,251	1,054,620	54,373	137,947
Johns Hopkins U. ^b	1,708,000	845,610	2,947	651,779	173,223	30,458	720	3,264
U. Michigan	700,050	51,965	20,321	508,120	17,689	83,895	1,187	16,873
U. Washington	667,400	74,925	17,397	434,121	13,548	96,467	5,514	25,428
U. California, San Diego	639,089	106,938	15,877	404,836	9,444	87,691	557	13,746
U. California, San Francisco	628,270	33,156	0	585,817	0	8,639	0	658
Stanford U.	581,148	50,101	12,979	448,394	12,101	52,766	0	4,807
Columbia U. in the City of New York	574,306	41,063	6,896	425,803	16,727	80,850	0	2,968
U. Pennsylvania	552,306	27,458	6,200	474,339	3,628	37,583	1,107	1,991
U. Pittsburgh	544,466	39,475	3,003	471,639	675	29,673	0	0
Duke U.	523,037	32,773	9,494	447,708	1,832	29,072	675	1,484
U. California, Los Angeles	522,729	33,432	17,033	394,248	15,937	60,781	177	1,121
Harvard U.	490,075	53,327	7,580	383,407	6,717	36,006	50	2,988
U. Wisconsin-Madison	485,333	24,418	59,474	288,841	0	91,904	18,578	2,118
U. Colorado Boulder	481,184	41,125	10,161	258,926	63,291	80,789	891	26,001
Washington U., Saint Louis	476,403	11,504	9,710	431,382	6,596	17,192	15	3
Georgia Institute of Technology	473,320	354,408	4,739	31,798	9,468	65,915	50	6,944
U. North Carolina, Chapel Hill	460,652	4,914	6,378	406,405	992	37,303	25	4,636
Yale U.	460,097	22,203	5,577	406,585	2,248	21,178	137	2,168
Pennsylvania State U.	450,200	229,932	14,648	101,337	10,564	64,688	24,678	4,354
U. Southern California	422,562	110,852	3,339	247,620	2,573	41,772	12	16,395
All other academic institutions	20,590,166	1,980,716	761,356	11,248,571	734,560	4,304,111	886,673	674,179

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.

^a Includes data for the following agencies: the Departments of Commerce, Education, Homeland Security, Housing and Urban Development, the Interior, and Transportation; the Agency for International Development; the Environmental Protection Agency; the Appalachian Regional Commission; the Nuclear Regulatory Commission; the Office of Justice Programs (part of the Department of Justice); and the Social Security Administration.

^b Includes funding for Applied Physics Laboratory.

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

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions, FY 2017.

High-Hispanic-Enrollment Institutions

Among other minority-serving institutions, high-Hispanic-enrollment institutions (HHEs)³ received \$1.7 billion in federal obligations for S&E support in FY 2017, a 1% increase from FY 2016 (table 7). Support to HHEs for R&D amounted to \$1.5 billion, up 3% from the FY 2016 total. R&D obligations accounted for 89% of total federal S&E support to HHEs. By comparison, R&D accounted for 76% of the S&E total obligations to HBCUs and for 92% of all federal S&E support to higher

education institutions. The majority (58%) of the FY 2017 S&E support to HHEs came from HHS, with over \$1 billion in obligations. NSF was the second-leading federal agency to support HHEs, with \$365 million (21%) (details available in table 26 in the full set of data tables).

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 2017, federal agencies obligated \$7.2 billion in R&D and R&D plant to 956 nonprofit institutions (table 8). The Patient-Centered Outcomes Research Institute received the most in federal funds for R&D and R&D plant (\$884 million).

Data Sources and Limitations

Gross domestic product implicit price deflators were used to convert current to constant dollars in this InfoBrief.⁴ Data presented here were obtained from the 20 agencies (12 federal depart-

TABLE 5. Federal science and engineering obligations to the 20 HBCUs receiving the largest amounts, by type of activity: FY 2017

(Thousands of dollars)

Institution	All federal obligations	R&D	R&D plant	Facilities for instruction in S&E	Fellowships, traineeships, and training grants	General support for S&E	Other S&E activities
All HBCUs	307,892	234,460	903	0	58,895	40	13,595
Top 20 HBCUs	222,903	180,640	643	0	37,911	40	3,670
North Carolina Agricultural and Technical State U.	26,793	17,939	53	0	7,512	0	1,290
Florida A&M U.	19,665	15,428	97	0	4,125	16	0
Morehouse School of Medicine	18,268	17,947	0	0	321	0	0
Meharry Medical C.	15,310	13,689	0	0	1,621	0	0
Howard U.	12,825	10,516	14	0	2,123	0	172
North Carolina Central U.	12,301	10,838	0	0	1,463	0	0
Jackson State U.	11,777	9,434	0	0	2,343	0	0
Hampton U.	11,431	9,757	0	0	1,650	24	0
Tuskegee U.	10,113	7,483	200	0	2,430	0	0
Prairie View A&M U.	10,100	9,707	0	0	393	0	0
Morgan State U.	9,036	5,611	3	0	2,142	0	1,279
Tennessee State U.	8,659	7,852	0	0	808	0	0
Delaware State U.	8,156	6,003	263	0	1,795	0	96
Xavier U. Louisiana	7,756	6,068	0	0	1,689	0	0
U. of the Virgin Islands	7,543	5,323	0	0	2,220	0	0
Virginia State U.	7,099	5,124	0	0	1,558	0	417
Norfolk State U.	6,934	6,221	14	0	698	0	0
Alabama A&M U.	6,679	5,779	0	0	900	0	0
Southern U. and A&M C., system office	6,422	4,338	0	0	2,084	0	0
U. Arkansas, Pine Bluff	6,036	5,584	0	0	36	0	417
All other HBCUs	84,989	53,821	259	0	20,984	0	9,925

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

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

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions FY 2017.

ments and 8 independent agencies) that made S&E obligations to academic and nonprofit institutions in FY 2017, 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 development* includes all direct, indirect, incidental, or related costs resulting from or necessary to perform R&D by private indi-

viduals 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 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.

TABLE 6. Federal science and engineering obligations to the 20 HBCUs receiving the largest amounts, by agency: FY 2017
(Thousands of dollars)

Institution	All agencies	DOD	DOE	ED	HHS	NASA	NSF	USDA	Other agencies ^a
All HBCUs	307,892	18,199	12,908	14,184	98,150	5,191	78,672	74,616	5,972
Top 20 HBCUs	222,903	12,979	12,758	3,896	84,851	5,042	53,308	44,320	5,750
North Carolina Agricultural and Technical State U.	26,793	1,955	2,054	447	1,756	0	14,741	4,340	1,502
Florida A&M U.	19,665	1,396	4,465	741	3,818	0	6,113	3,014	120
Morehouse School of Medicine	18,268	0	0	0	18,268	0	0	0	0
Meharry Medical C.	15,310	0	0	0	15,310	0	0	0	0
Howard U.	12,825	1,044	0	250	9,250	26	2,256	0	0
North Carolina Central U.	12,301	0	695	250	7,345	0	2,721	0	1,291
Jackson State U.	11,777	2,458	486	250	4,839	0	3,744	0	0
Hampton U.	11,431	376	747	120	4,609	3,965	1,394	0	221
Tuskegee U.	10,113	276	0	0	2,386	0	2,915	4,412	124
Prairie View A&M U.	10,100	250	0	0	112	0	2,806	5,857	1,076
Morgan State U.	9,036	350	0	0	5,419	1,052	798	0	1,417
Tennessee State U.	8,659	581	0	0	1,748	0	496	5,834	0
Delaware State U.	8,156	766	0	0	2,436	0	2,649	2,305	0
Xavier U. Louisiana	7,756	91	0	0	7,278	0	388	0	0
U. of the Virgin Islands	7,543	143	0	0	279	0	5,109	2,013	0
Virginia State U.	7,099	572	0	417	0	0	1,788	4,322	0
Norfolk State U.	6,934	1,168	4,311	0	0	0	1,455	0	0
Alabama A&M U.	6,679	1,428	0	119	0	0	437	4,694	0
Southern U. and A&M C., system office	6,422	0	0	701	0	0	3,500	2,222	0
U. Arkansas, Pine Bluff	6,036	125	0	602	0	0	0	5,309	0
All other HBCUs	84,989	5,220	150	10,289	13,299	148	25,364	30,295	223

DOD = Department of Defense; DOE = Department of Energy; 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, Transportation; the Environmental Protection Agency; and the Social Security Administration.

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

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions, FY 2017.

- *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 2017 Federal S&E Support Survey will be available online at <https://www.nsf.gov/statistics/srvyfedsupport/>. Individual tables may be available in

advance of the full report. Data for the survey will be available in NCSSES's interactive data tool (<https://ncesdata.nsf.gov/ids/fss>). For more information, please contact the author.

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 a 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.”

TABLE 7. Federal science and engineering obligations to 10 HHEs receiving the largest amounts, by type of activity: FYs 2016–17

Institution	All federal obligations	R&D	R&D plant	Facilities for instruction in S&E	Fellowships, traineeships, and training grants	General support for S&E	Other S&E activities
FY 2017 (current \$thousands)							
All HHEs	1,735,558	1,546,178	7,232	0	114,600	7,804	59,745
Top 10 HHEs	1,212,515	1,113,854	2,978	0	50,226	4,534	40,923
U. Arizona	224,132	202,668	771	0	11,347	0	9,346
U. California, Irvine	181,488	165,191	366	0	10,599	0	5,332
U. Texas M. D. Anderson Cancer Center	155,319	143,478	0	0	2,378	0	9,463
U. Illinois, Chicago	146,914	137,361	226	0	5,119	480	3,729
U. New Mexico	122,853	111,442	79	0	7,324	125	3,883
U. California, Santa Barbara	103,095	99,769	1,211	0	1,836	0	280
U. Texas Health Science Center, Houston ^a	88,950	86,926	0	0	1,849	0	175
U. Texas Health Science Center, San Antonio	68,986	58,456	0	0	3,699	576	6,255
Florida International U.	60,621	50,852	326	0	4,209	2,898	2,337
U. California, Santa Cruz	60,156	57,711	0	0	1,866	456	124
All other HHEs	523,044	432,324	4,254	0	64,374	3,270	18,822
FY 2016 (current \$thousands)							
All HHEs	1,719,520	1,499,734	14,501	0	134,228	11,387	59,671
Top 10 HHEs	1,163,023	1,069,864	6,238	0	51,453	5,297	30,172
U. Arizona	211,508	185,962	2,385	0	11,025	393	11,744
U. California, Irvine	181,119	167,846	18	0	10,764	1,632	860
U. Illinois, Chicago	145,695	133,214	1,567	0	6,603	0	4,311
U. Texas M. D. Anderson Cancer Center	129,868	119,083	0	0	2,193	0	8,593
U. New Mexico	108,798	100,082	235	0	5,721	1,894	865
U. California, Santa Barbara	100,306	95,567	1,154	0	1,331	600	1,655
U. Texas Health Science Center, Houston ^a	86,983	84,256	0	0	2,550	0	177
U. California, Santa Cruz	72,560	68,978	413	0	2,870	0	298
U. California, Riverside	64,251	58,603	466	0	4,768	178	236
U. Texas Health Science Center, San Antonio	61,936	56,274	0	0	3,628	600	1,434
All other HHEs	556,498	429,871	8,264	0	82,775	6,090	29,499

HHEs = high-Hispanic-enrollment institutions.

^a Excludes obligations for the University of Texas Health Science Center at Houston's School of Dentistry.

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 HHEs includes those institutions of higher education whose full-time equivalent (FTE) enrollment of undergraduate students is at least 25% Hispanic, according to fall 2016 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 Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions.

3. HHE institutions are those whose full-time equivalent (FTE) enrollment of undergraduate students is at least 25% Hispanic, according to fall 2016 enrollment data self-reported by the institutions in the Integrated Postsecondary Education Data System survey conducted by the National Center for Education Statistics (NCES). Fall 2017

enrollment data were not available at the time these data were produced. NCES determined FTE enrollment by calculating that approximately three part-time students are equivalent to one full-time student.

4. Gross domestic product implicit price deflators on a federal fiscal year basis

were adjusted from historical figures for 1953–2017. Office of Management and Budget. 2018. Budget of the United States Government, Fiscal Year 2019, Historical Tables (Table 10.1). Office of Management and Budget. 2018. Budget of the United States Federal Government, Fiscal Year 2019, Economic Assumptions, Projections, 2018–2021.

TABLE 8. Federal research and development and R&D plant obligations to the 10 independent nonprofit institutions receiving the largest amounts, by agency: FY 2017
(Thousands of dollars)

Institution	All federal obligations	HHS	DOD	NSF	NASA	DOE	Other agencies ^a
All institutions	7,214,464	4,611,451	915,480	326,097	198,814	68,511	1,094,111
Top 10 nonprofit institutions	3,096,676	1,823,131	272,810	96,905	3,693	14,523	885,614
Patient-Centered Outcomes Research Institute	883,941	0	0	0	0	0	883,941
Massachusetts General Hospital	394,497	375,973	17,209	1,079	236	0	0
Brigham and Women's Hospital	371,925	369,848	692	0	1,386	0	0
Mayo Clinic	300,890	299,930	853	107	0	0	0
Fred Hutchinson Cancer Research Center	280,404	278,425	1,423	556	0	0	0
Battelle Memorial Institute	279,123	16,391	174,861	72,261	33	14,523	1,055
SRI International	162,329	60,449	77,773	21,452	2,038	0	618
Children's Hospital Boston	150,149	149,179	0	970	0	0	0
Dana-Farber Cancer Institute	139,922	139,761	0	161	0	0	0
Memorial Sloan Kettering Cancer Center	133,495	133,176	0	319	0	0	0
All other nonprofit institutions	4,117,789	2,788,320	642,671	229,192	195,122	53,988	208,497

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 sum to total due to rounding.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions, FY 2017.