

Baccalaureate Origins of U.S.-trained S&E Doctorate Recipients

by Mark K. Fiegener and Steven L. Proudfoot¹

Foreign institutions and U.S. research universities play large roles in the baccalaureate education of U.S.-trained science and engineering (S&E) doctorate recipients.² In 2011, about one-third (35%) of individuals earning S&E doctorates from U.S. universities held bachelor's degrees from foreign institutions, and 29% earned bachelor's degrees from U.S. doctorate-granting institutions with very high research activity³ (table 1). Other doctorate-granting universities, master's colleges and universities, and baccalaureate colleges combined to

account for another 28%. Among U.S. S&E doctorate recipients, the proportion with a foreign bachelor's degree increased 4 percentage points from 2002 to 2011, while the proportion with a bachelor's degree from a U.S. institution declined slightly over this period for each type of institution.

Public universities with very high research activity are prominent in the baccalaureate training of U.S. S&E doctorate recipients, as reflected in the ranked list of U.S. baccalaureate-origin institutions (table 2). Of the top 20 U.S.

baccalaureate-origin institutions for 2002–11 S&E doctorate recipients, 19 are research universities with very high research activity, including 15 public institutions. Of the top 50 U.S. baccalaureate-origin institutions for 2002–11 S&E doctorate recipients, approximately two-thirds are public institutions, and only 1, Brigham Young University, is not a research university with very high research activity.

Table 3 reports the top 10 U.S. baccalaureate-origin institutions for 2002–11 doctorate recipients in each of the four

TABLE 1. S&E doctorate recipients, by 2010 Carnegie classification of baccalaureate institution: 2002–11

Year	All institutions	Very high research activity universities	Other doctorate-granting universities ^a	Master's colleges and universities	Baccalaureate colleges	Other or unclassified Carnegie group ^b	Foreign institutions	Unknown baccalaureate-origin institutions
2002	26,265	7,961	2,737	2,666	2,460	139	8,069	2,233
2003	26,917	8,027	2,723	2,629	2,520	145	8,753	2,120
2004	27,993	7,989	2,650	2,768	2,585	143	9,423	2,435
2005	29,770	8,116	2,849	2,816	2,560	167	10,960	2,302
2006	31,778	8,470	2,918	2,873	2,716	169	12,233	2,399
2007	33,977	8,693	2,983	3,024	2,892	174	13,082	3,129
2008	34,927	9,457	3,185	3,048	2,863	198	13,054	3,122
2009	35,560	10,027	3,384	3,261	3,098	175	12,790	2,825
2010	35,234	10,245	3,320	3,314	3,061	163	12,096	3,035
2011	36,654	10,555	3,606	3,437	3,229	178	12,721	2,928

S&E = science and engineering; includes health fields.

^a Includes high research activity and doctoral/research universities.

^b Includes associate's colleges, special focus institutions, and tribal colleges.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Earned Doctorates.

TABLE 2. Top 50 U.S. baccalaureate-origin institutions of 2002–11 S&E doctorate recipients, by institutional control and 2010 Carnegie classification

Rank	Academic institution	Institutional control	2010 Carnegie classification	S&E doctorate recipients
na	All baccalaureate-origin institutions	na	na	319,075
na	Foreign institutions	na	na	113,181
na	Unknown institutions	na	na	26,528
1	U. CA, Berkeley	Public	Research-very high	3,406
2	Cornell U., all campuses	Private	Research-very high	2,646
3	U. MI, Ann Arbor	Public	Research-very high	2,205
4	U. IL, Urbana-Champaign	Public	Research-very high	1,976
5	PA State U., main campus	Public	Research-very high	1,934
6	U. WI, Madison	Public	Research-very high	1,881
7	MA Institute of Technology	Private	Research-very high	1,880
8	U. CA, Los Angeles	Public	Research-very high	1,873
9	Harvard U.	Private	Research-very high	1,794
10	U. TX, Austin	Public	Research-very high	1,787
11	U. FL	Public	Research-very high	1,730
12	Brigham Young U., main campus	Private	Research-high	1,688
13	U. CA, San Diego	Public	Research-very high	1,546
14	U. CA, Davis	Public	Research-very high	1,542
15	Stanford U.	Private	Research-very high	1,359
16	TX A&M U., main campus	Public	Research-very high	1,299
17	U. VA, main campus	Public	Research-very high	1,260
18	Rutgers, State U. NJ, New Brunswick	Public	Research-very high	1,256
18	U. WA, Seattle	Public	Research-very high	1,256
20	U. MD, College Park	Public	Research-very high	1,216
21	Virginia Polytechnic Institute and State U.	Public	Research-very high	1,193
22	Brown U.	Private	Research-very high	1,188
23	OH State U., main campus	Public	Research-very high	1,178
24	U. MN, Twin Cities	Public	Research-very high	1,161
25	Princeton U.	Private	Research-very high	1,131
26	Duke U.	Private	Research-very high	1,103
27	Purdue U., main campus	Public	Research-very high	1,097
28	MI State U.	Public	Research-very high	1,092
28	U. AZ	Public	Research-very high	1,092
30	U. PA	Private	Research-very high	1,081
31	Yale U.	Private	Research-very high	1,020
32	U. NC, Chapel Hill	Public	Research-very high	991
33	U. CO, Boulder	Public	Research-very high	987
34	U. CA, Santa Barbara	Public	Research-very high	959
35	U. CA, Santa Cruz	Public	Research-very high	952
36	Northwestern U.	Private	Research-very high	949
37	U. of Chicago	Private	Research-very high	940
38	NC State U., Raleigh	Public	Research-very high	938
39	Boston U.	Private	Research-very high	913
40	GA Institute of Technology, main campus	Public	Research-very high	911
41	IA State U.	Public	Research-very high	863
42	Columbia U. in the City of New York	Private	Research-very high	829
43	Carnegie Mellon U.	Private	Research-very high	812
44	Johns Hopkins U.	Private	Research-very high	797
45	U. CA, Irvine	Public	Research-very high	787
46	IN U., Bloomington	Public	Research-very high	785
47	U. of Rochester	Private	Research-very high	771
48	AZ State U.	Public	Research-very high	744
49	CA Institute of Technology	Private	Research-very high	739
50	U. DE	Public	Research-very high	734

na = not applicable.

S&E = science and engineering; includes health fields.

NOTE: Institutions with the same number of doctorate recipients are listed alphabetically.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Earned Doctorates.

broad subfields of S&E: life sciences, physical sciences, social sciences, and engineering. The public research universities dominate these lists. Of the 18 institutions listed in the table, 12 appear on the top 10 list for multiple broad subfields, and 4 institutions—the University of California, Berkeley; Cornell University; Pennsylvania State University; and the University of Michigan at Ann Arbor—appear on each list. The University of California, Berkeley is the top-ranking institution in all three of the science subfields and ranks second in engineering.

Institutional-Yield Ratio Based on All S&E Doctorate Recipients

Although U.S. research universities are few in number (108 universities are classified as research universities with very high research activity, according to the 2010 Carnegie basic classification), collectively they award a large proportion of U.S. bachelor's degrees each year. In contrast, the several hundred baccalaureate colleges in the United States, as a group, award a smaller proportion of the total number of U.S. bachelor's degrees.⁴ Because the number of bachelor's degrees awarded per institution—and, thus, the pool of potential doctorate recipients—is smaller for baccalaureate colleges than for research universities with very high research activity, rankings of baccalaureate-origin institutions based on the absolute numbers of S&E doctorate recipients understate the contributions of the baccalaureate colleges in the training of U.S. S&E doctorate recipients. To account for this disparity, a second measure of institutional contribution is used to establish rankings. The “institutional-yield ratio” for a baccalaureate-origin institution for a given year is expressed as the number

TABLE 3. Top 10 U.S. baccalaureate-origin institutions of 2002–11 S&E doctorate recipients, by doctoral field of degree, institutional control, and 2010 Carnegie classification

Rank	Doctoral field of degree and academic institution	Institutional control	2010 Carnegie classification	S&E doctorate recipients
Life sciences ^a				
1	U. CA, Berkeley	Public	Research-very high	1,132
2	Cornell U., all campuses	Private	Research-very high	1,085
3	U. WI, Madison	Public	Research-very high	854
4	U. CA, Davis	Public	Research-very high	817
5	PA State U., main campus	Public	Research-very high	754
6	U. IL, Urbana-Champaign	Public	Research-very high	745
7	U. CA, Los Angeles	Public	Research-very high	686
8	U. CA, San Diego	Public	Research-very high	673
9	U. MI, Ann Arbor	Public	Research-very high	655
10	U. FL	Public	Research-very high	641
Physical sciences				
1	U. CA, Berkeley	Public	Research-very high	740
2	MA Institute of Technology	Private	Research-very high	637
3	Harvard U.	Private	Research-very high	548
4	Cornell U., all campuses	Private	Research-very high	505
5	CA Institute of Technology	Public	Research-very high	404
6	U. MI, Ann Arbor	Public	Research-very high	368
7	Brigham Young U., main campus	Private	Research-high	335
8	PA State U., main campus	Public	Research-very high	331
9	U. TX, Austin	Public	Research-very high	328
10	U. IL, Urbana-Champaign	Public	Research-very high	324
Social sciences ^b				
1	U. CA, Berkeley	Public	Research-very high	888
2	U. MI, Ann Arbor	Public	Research-very high	724
3	U. CA, Los Angeles	Public	Research-very high	645
4	Harvard U.	Private	Research-very high	629
5	Cornell U., all campuses	Private	Research-very high	597
6	U. TX, Austin	Public	Research-very high	586
7	Brigham Young U., main campus	Private	Research-high	516
8	U. FL	Public	Research-very high	468
9	U. WI, Madison	Public	Research-very high	445
10	PA State U., main campus	Public	Research-very high	424
Engineering				
1	MA Institute of Technology	Private	Research-very high	671
2	U. CA, Berkeley	Public	Research-very high	646
3	GA Institute of Technology, main campus	Public	Research-very high	510
4	U. IL, Urbana-Champaign	Public	Research-very high	507
5	U. MI, Ann Arbor	Public	Research-very high	458
6	Cornell U., all campuses	Private	Research-very high	457
7	PA State U., main campus	Public	Research-very high	425
8	U. FL	Public	Research-very high	387
9	Purdue U., main campus	Public	Research-very high	382
10	VA Polytechnic Institute and State U.	Public	Research-very high	365

S&E = science and engineering; includes health fields.

^a Includes agricultural, biological, biomedical, and health sciences.

^b Includes psychology.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Earned Doctorates.

of S&E doctorate recipients per 100 bachelor's degrees awarded in all fields 9 years earlier.⁵

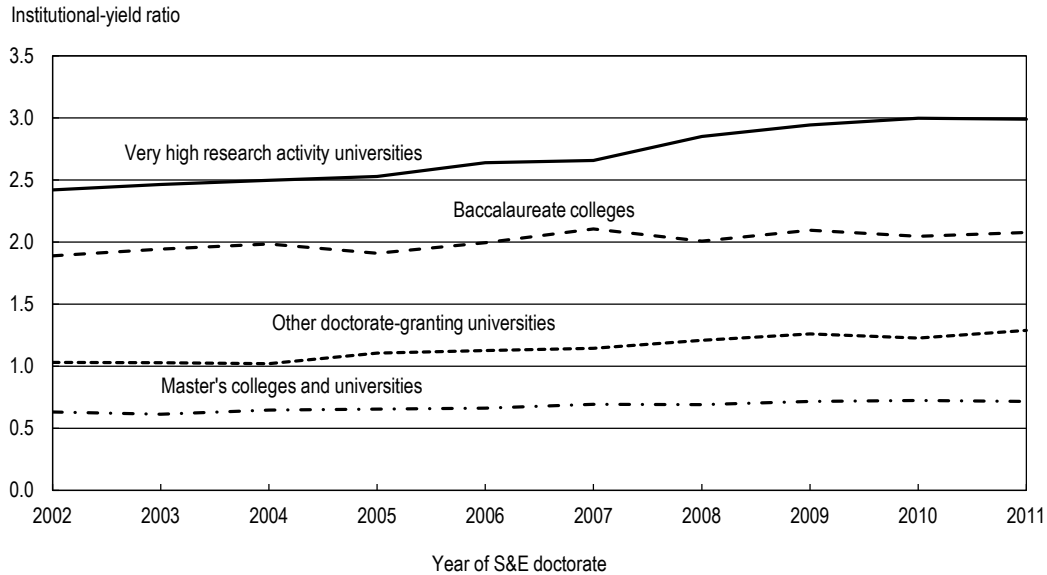
Research universities with very high research activity had the highest institutional-yield ratio each year from 2002 to 2011, followed by baccalaureate colleges, other doctorate-granting universities, and master's colleges and universities (figure 1). The institutional-yield ratios increased for all four types of institutions over this period, and research universities with very high research activity and other doctorate-granting universities showed the largest increases.

When institutional rankings are determined according to the institutional-yield ratio based on S&E doctorate recipients rather than the absolute counts of S&E doctorate recipients, the list of top U.S. baccalaureate-origin institutions changes dramatically (table 4). Nine of the top 20 U.S. baccalaureate-origin institutions of 2002–11 S&E doctorate recipients are baccalaureate colleges, 10 are research universities with very high research activity, and only 1 of the top 20 (New Mexico Institute of Mining and Technology) is a public institution. Of the top 50 U.S. baccalaureate-origin institutions ranked by the institutional-yield ratio, 27 are baccalaureate colleges and 21 are research universities with very high research activity). Only 3 of the institutions appearing on the top 20 list of table 2 also appear in the top 20 of table 4: Massachusetts Institute of Technology, Harvard University, and Stanford University.

Historically Black Colleges and Universities

In 2011, 24% of black S&E doctorate recipients⁶ received their bachelor's degree from historically black colleges and universities (HBCUs), the second

FIGURE 1. Institutional-yield ratios based on S&E doctorate recipients, by 2010 Carnegie classification of U.S. baccalaureate institution: 2002–11



S&E = science and engineering; includes health fields.

NOTES: Institutional-yield ratio is the number of S&E doctorate recipients per 100 bachelor's degrees awarded in all fields 9 years earlier. Other doctorate-granting universities include the two other Carnegie categories of doctorate-granting institutions: high research activity and doctoral/research universities.

SOURCES: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Earned Doctorates; U.S. Department of Education National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey.

most common type of baccalaureate-origin institution next to research universities with very high research activity (29%) for these doctorate recipients (table 5). The proportion of black S&E doctorate recipients with bachelor's degrees from HBCUs has declined from 2006 to 2011, while the proportion with bachelor's degrees from research universities with very high research activity remained near 30% for all but one year of the 2002–11 period. Foreign institutions provided the baccalaureate training for a small but growing proportion of black S&E doctorate recipients, accounting for 7% of the doctorate recipients in 2002 and 11% in 2011.

The importance of HBCUs and research universities with very high research activity in the training of black S&E doctorate recipients is evident from the rankings of baccalaureate-

origin institutions of black S&E doctorate recipients (table 6). Ten of the top 11 baccalaureate-origin institutions of black S&E doctorate recipients from 2002–11 are HBCUs, and 19 of the top 20 are either HBCUs or research universities with very high research activity. The University of Maryland, Baltimore County is the only institution in the top 20 that is neither an HBCU nor a research university with very high research activity. Thirteen of the top 20 institutions are public institutions. Of the top 50 baccalaureate-origin institutions of black S&E doctorate recipients, 21 are HBCUs and 27 are research universities with very high research activity.

Table 7 reports the top 10 baccalaureate-origin institutions for 2002–11 black doctorate recipients by broad subfield of S&E. All of the top-ranking baccalaureate-origin institutions in

physical sciences and all but one of the top-ranking institutions in life sciences are HBCUs. Research universities with very high research activity are among the top 10 baccalaureate-origin institutions of black doctorate recipients in two S&E subfields: social sciences and engineering. Twelve of the 22 institutions listed in the table appear on the top 10 list for multiple broad subfields, and Howard University and Florida A&M University appear on each list.

Institutional-Yield Ratio Based on Black S&E Doctorate Recipients

As noted earlier in this report, institutional rankings based on absolute numbers of S&E doctorate recipients may not fully reflect the relative contributions of particular types of institutions in the training of S&E doctorate recipients. Figure 2 shows the institutional-yield ratio based on black

TABLE 4. Top 50 U.S. baccalaureate-origin institutions of 2002–11 S&E doctorate recipients, by institutional-yield ratio, institutional control, and 2010 Carnegie classification

Rank	Academic institution	Institutional control	2010 Carnegie classification	S&E doctorate recipients	
				Number	Institutional-yield ratio
1	CA Institute of Technology	Private	Research-very high	739	34.9
2	Harvey Mudd C.	Private	Baccalaureate	359	24.4
3	MA Institute of Technology	Private	Research-very high	1,880	16.0
4	Reed C.	Private	Baccalaureate	374	14.2
5	Swarthmore C.	Private	Baccalaureate	472	13.1
6	Carleton C.	Private	Baccalaureate	555	12.3
7	Grinnell C.	Private	Baccalaureate	366	11.1
8	Rice U.	Private	Research-very high	728	10.8
9	U. of Chicago	Private	Research-very high	940	10.7
10	Princeton U.	Private	Research-very high	1,131	10.1
11	Harvard U.	Private	Research-very high	1,794	10.0
12	Pomona C.	Private	Baccalaureate	345	9.5
13	Haverford C.	Private	Baccalaureate	269	9.5
14	NM Institute of Mining and Technology	Public	Master's granting	142	9.1
15	Williams C.	Private	Baccalaureate	451	8.7
16	Case Western Reserve U.	Private	Research-very high	608	8.4
17	Bryn Mawr C.	Private	Baccalaureate	245	8.3
18	Stanford U.	Private	Research-very high	1,359	8.0
19	Brown U.	Private	Research-very high	1,188	8.0
20	Yale U.	Private	Research-very high	1,020	7.8
21	Macalester C.	Private	Baccalaureate	311	7.8
22	Carnegie Mellon U.	Private	Research-very high	812	7.7
23	Cornell U., all campuses	Private	Research-very high	2,646	7.7
24	Hillsdale C.	Private	Baccalaureate	65	7.7
25	Oberlin C.	Private	Baccalaureate	523	7.6
26	Amherst C.	Private	Baccalaureate	309	7.4
27	Johns Hopkins U.	Private	Research-very high	797	7.2
28	Lawrence U.	Private	Baccalaureate	178	7.1
29	Duke U.	Private	Research-very high	1,103	7.1
30	Kalamazoo C.	Private	Baccalaureate	182	6.8
31	U. of Rochester	Private	Research-very high	771	6.6
32	Wesleyan U.	Private	Baccalaureate	471	6.6
33	Cooper Union for the Advancement of Science and Art	Private	Baccalaureate	125	6.5
34	Wellesley C.	Private	Baccalaureate	386	6.5
35	Hendrix C.	Private	Baccalaureate	129	6.3
36	Whitman C.	Private	Baccalaureate	193	6.3
37	Brandeis U.	Private	Research-very high	451	6.3
38	Allegheny C.	Private	Baccalaureate	233	6.1
39	Vassar C.	Private	Baccalaureate	348	6.1
40	Bowdoin C.	Private	Baccalaureate	240	6.1
41	Dartmouth C.	Private	Research-very high	654	6.0
42	Earlham C.	Private	Baccalaureate	138	6.0
43	U. CA, Berkeley	Public	Research-very high	3,406	5.9
44	Rensselaer Polytechnic Institute	Private	Research-very high	590	5.9
45	Mount Holyoke C.	Private	Baccalaureate	278	5.8
46	Columbia U. in the City of New York	Private	Research-very high	829	5.7
47	CO School of Mines	Public	Research-very high	237	5.7
48	Occidental C.	Private	Baccalaureate	206	5.7
49	Franklin and Marshall C.	Private	Baccalaureate	231	5.5
50	C. of William and Mary	Public	Research-high	718	5.5

S&E = science and engineering; includes health fields.

NOTES: Institutional-yield ratio is the number of S&E doctorate recipients per 100 bachelor's degrees awarded in all fields 9 years earlier. Only institutions from which 50 or more baccalaureate recipients received S&E doctorate degrees between 2002 and 2011 were included in the analysis. Institutions are ranked on unrounded ratios.

SOURCES: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Earned Doctorates; U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey.

TABLE 5. Black S&E doctorate recipients, by selected classes of baccalaureate-origin institutions: 2002–11

Year	All institutions	HBCUs	U.S. non-HBCU institutions					Foreign institutions	Unknown baccalaureate institutions
			Very high research activity universities	Other doctorate-granting universities ^a	Master's colleges and universities	Baccalaureate colleges	Other or unclassified Carnegie group ^b		
2002	763	198	243	78	106	67	6	51	14
2003	742	196	222	80	82	56	11	59	36
2004	863	241	253	92	117	58	9	60	33
2005	829	236	245	108	95	55	8	51	31
2006	876	260	251	114	93	59	7	70	22
2007	908	256	231	107	121	57	11	83	42
2008	928	227	291	124	102	53	11	85	35
2009	1,093	269	333	106	139	81	5	108	52
2010	1,053	276	331	108	114	79	8	101	36
2011	1,147	276	336	134	156	71	12	130	32

HBCU = historically black college or university. S&E = science and engineering; includes health fields.

^a Includes high research activity and doctoral/research universities.

^b Includes associate's colleges, special focus institutions, and tribal colleges.

NOTE: HBCUs are excluded from each of the 2010 Carnegie classification groups presented in the table.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Earned Doctorates.

S&E doctorate recipients (counts of black S&E doctorates in each category of baccalaureate-origin institution are normalized by the number of bachelor's degrees awarded to blacks 9 years earlier by universities in the same Carnegie class). In every year from 2002 to 2011, research universities with very high research activity had the highest institutional-yield ratio based on blacks with S&E doctorates. The institutional-yield ratio of HBCUs has been equal to or greater than that of baccalaureate colleges every year since 2005. Over the years 2002 to 2011, HBCUs are the only type of baccalaureate-origin institution that has shown an upward trend (albeit slight) in institutional-yield ratio based on blacks with S&E doctorates.

Determining the institutional rankings on the institutional-yield ratio based on blacks with S&E doctorates, rather than on the absolute counts of black S&E doctorate recipients, generates a very different list of top producing baccalaureate-origin institutions (table 8). Of the top 20 baccalaureate-origin

institutions for black S&E doctorate recipients over the 2002–11 period, 16 are research universities with very high research activity and 3 are HBCUs (all baccalaureate colleges). Only 2 of the top 20 are public institutions. Expanding the list to include the top 50 baccalaureate-origin institutions of black S&E doctorate recipient reveals 36 very high research universities, 12 HBCUs (of which 8 are baccalaureate colleges), and 22 public institutions. Only 4 of the institutions appearing on the top 20 list of table 6 also appear in the top 20 of table 8: Harvard University; University of Maryland, Baltimore County; Spelman College; and Xavier University of Louisiana.

Notes

1. Mark K. Fiegener (mfiegene@nsf.gov; 703-292-4622), Steven L. Proudfoot (sproudfo@nsf.gov; 703-292-4434), Human Resources Statistics Program, National Center for Science and Engineering Statistics, National Science Foundation, 4201 Wilson Boulevard, Suite 965, Arlington, VA 22230.

2. In this InfoBrief, science and engineering includes health fields. This InfoBrief updates the analysis reported in two earlier InfoBriefs: *Baccalaureate Origins of S&E Doctorate Recipients* (NSF 08-311) and *Role of HBCUs as Baccalaureate-Origin Institutions of Black S&E Doctorate Recipients* (NSF 08-319). Data collected by the National Science Foundation's (NSF's) Survey of Earned Doctorates are used to report the numbers of S&E doctorate recipients between 2002 and 2011. Data from the Department of Education's Completions Survey provide the numbers of bachelor's degrees awarded between 1993 and 2002, 9 years prior to each year of doctoral degree data.

3. The 2010 version of the Carnegie Foundation for the Advancement of Teaching's Basic Classification scheme for colleges and universities categorizes academic institutions on the basis of highest degree conferred, level of degree production, and research activity. Institutions that award at least 20 doctoral degrees per year are called doctorate-granting universities, and are

TABLE 6. Top 50 U.S. baccalaureate-origin institutions of 2002–11 black S&E doctorate recipients, by institutional control, 2010 Carnegie classification, and HBCU status

Rank	Academic institution	Institutional control	2010 Carnegie classification	HBCU	Black S&E doctorate recipients
na	All baccalaureate-origin institutions	na	na	na	9,202
na	Foreign institutions	na	na	na	798
na	Unknown institutions	na	na	na	345
1	Howard U.	Private	Research-high	Yes	220
2	Spelman C.	Private	Baccalaureate	Yes	175
3	FL A&M U.	Public	Doctoral/Research	Yes	154
4	Hampton U.	Private	Master's granting	Yes	150
5	Xavier U. LA	Private	Baccalaureate	Yes	126
6	Morehouse C.	Private	Baccalaureate	Yes	106
7	Morgan State U.	Public	Doctoral/Research	Yes	102
7	NC A&T State U.	Public	Doctoral/Research	Yes	102
9	Southern U. and A&M C.	Public	Master's granting	Yes	100
10	Tuskegee U.	Private	Baccalaureate	Yes	80
10	U. MD, Baltimore County	Public	Research-high	No	80
12	U. MD, College Park	Public	Research-very high	No	76
13	U. MI, Ann Arbor	Public	Research-very high	No	73
14	U. VA, main campus	Public	Research-very high	No	72
15	Harvard U.	Private	Research-very high	No	71
16	Jackson State U.	Public	Research-high	Yes	69
17	U. CA, Berkeley	Public	Research-very high	No	64
18	U. IL, Urbana-Champaign	Public	Research-very high	No	62
18	U. NC, Chapel Hill	Public	Research-very high	No	62
20	TN State U.	Public	Doctoral/Research	Yes	61
21	Yale U.	Private	Research-very high	No	60
22	Brown U.	Private	Research-very high	No	55
22	MA Institute of Technology	Private	Research-very high	No	55
24	U. FL	Public	Research-very high	No	54
25	Cornell U., all campuses	Private	Research-very high	No	51
26	AL A&M U.	Public	Master's granting	Yes	50
26	NC State U., Raleigh	Public	Research-very high	No	50
28	Duke U.	Private	Research-very high	No	49
29	Princeton U.	Private	Research-very high	No	47
29	Rutgers, State U. NJ, New Brunswick	Public	Research-very high	No	47
31	CUNY City C.	Public	Master's granting	No	46
31	GA Institute of Technology, main campus	Public	Research-very high	No	46
31	MI State U.	Public	Research-very high	No	46
34	Clark Atlanta U.	Private	Doctoral/Research	Yes	45
34	FL State U.	Public	Research-very high	No	45
34	Prairie View A&M U.	Public	Master's granting	Yes	45
37	Tougaloo C.	Private	Baccalaureate	Yes	44
38	U. PA	Private	Research-very high	No	43
39	CUNY, Hunter C.	Public	Master's granting	No	42
39	PA State U., main campus	Public	Research-very high	No	42
41	Norfolk State U.	Public	Master's granting	Yes	41
42	LA State U. and A&M C.	Public	Research-very high	No	40
42	NC Central U.	Public	Master's granting	Yes	40
42	U. CA, Los Angeles	Public	Research-very high	No	40
45	Grambling State U.	Public	Master's granting	Yes	39
45	U. SC, Columbia	Public	Research-very high	No	39
47	Stanford U.	Private	Research-very high	No	36
47	TX A&M U., main campus	Public	Research-very high	No	36
47	U. GA	Public	Research-very high	No	36
50	Dillard U.	Private	Baccalaureate	Yes	35
50	Fisk U.	Private	Baccalaureate	Yes	35
50	Temple U.	Public	Research-high	No	35

na = not applicable.

HBCU = historically black college or university. S&E = science and engineering; includes health fields.

NOTES: Includes only U.S. citizens and permanent residents. Institutions with the same number of doctorate recipients are listed alphabetically.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Earned Doctorates.

TABLE 7. Top 10 U.S. baccalaureate-origin institutions of 2002–11 black S&E doctorate recipients, by field of doctoral degree, institutional control, 2010 Carnegie classification, and HBCU status

Rank	Academic institution	Institutional control	2010 Carnegie classification	HBCU	Black S&E doctorate recipients
Life sciences ^a					
1	Xavier U. LA	Private	Baccalaureate	Yes	74
2	Howard U.	Private	Research-high	Yes	61
3	Hampton U.	Private	Master's granting	Yes	57
4	Spelman C.	Private	Baccalaureate	Yes	55
5	U. MD, Baltimore County	Public	Research-high	No	50
6	FL A&M U.	Public	Doctoral/Research	Yes	46
7	NC A&T State U.	Public	Doctoral/Research	Yes	35
8	Southern U. and A&M C.	Public	Master's granting	Yes	34
9	Tuskegee U.	Private	Baccalaureate	Yes	32
10	Morehouse C.	Private	Baccalaureate	Yes	31
10	Morgan State U.	Public	Doctoral/Research	Yes	31
Physical sciences					
1	Howard U.	Private	Research-high	Yes	28
2	Hampton U.	Private	Master's granting	Yes	24
2	Morehouse C.	Private	Baccalaureate	Yes	24
4	Spelman C.	Private	Baccalaureate	Yes	23
5	Southern U. and A&M C.	Public	Master's granting	Yes	22
6	FL Agricultural and Mechanical U.	Public	Doctoral/Research	Yes	19
7	Xavier U. LA	Private	Baccalaureate	Yes	16
8	Jackson State U.	Public	Research-high	Yes	13
8	Norfolk State U.	Public	Master's granting	Yes	13
10	AL A&M U.	Public	Master's granting	Yes	12
10	NC A&T State U.	Public	Doctoral/Research	Yes	12
Social sciences ^b					
1	Howard U.	Private	Research-high	Yes	109
2	Spelman C.	Private	Baccalaureate	Yes	84
3	Hampton U.	Private	Master's granting	Yes	61
4	FL A&M U.	Public	Doctoral/Research	Yes	52
5	Harvard U.	Private	Research-very high	No	44
6	U. CA, Berkeley	Public	Research-very high	No	42
7	Morehouse C.	Private	Baccalaureate	Yes	39
8	U. MD, College Park	Public	Research-very high	No	37
8	U. VA, main campus	Public	Research-very high	No	37
10	Yale U.	Private	Research-very high	No	36
Engineering					
1	NC A&T State U.	Public	Doctoral/Research	Yes	48
2	FL A&M U.	Public	Doctoral/Research	Yes	37
3	Morgan State U.	Public	Doctoral/Research	Yes	32
4	Brown U.	Private	Research-very high	No	28
5	GA Institute of Technology, main campus	Public	Research-very high	No	25
6	Howard U.	Private	Research high	Yes	22
7	Tuskegee U.	Private	Baccalaureate	Yes	20
8	U. MI, Ann Arbor	Public	Research-very high	No	18
9	U. MD, College Park	Public	Research-very high	No	16
9	U. MD, Baltimore County	Public	Research-high	No	16

HBCU = historically black college or university. S&E = science and engineering; includes health fields.

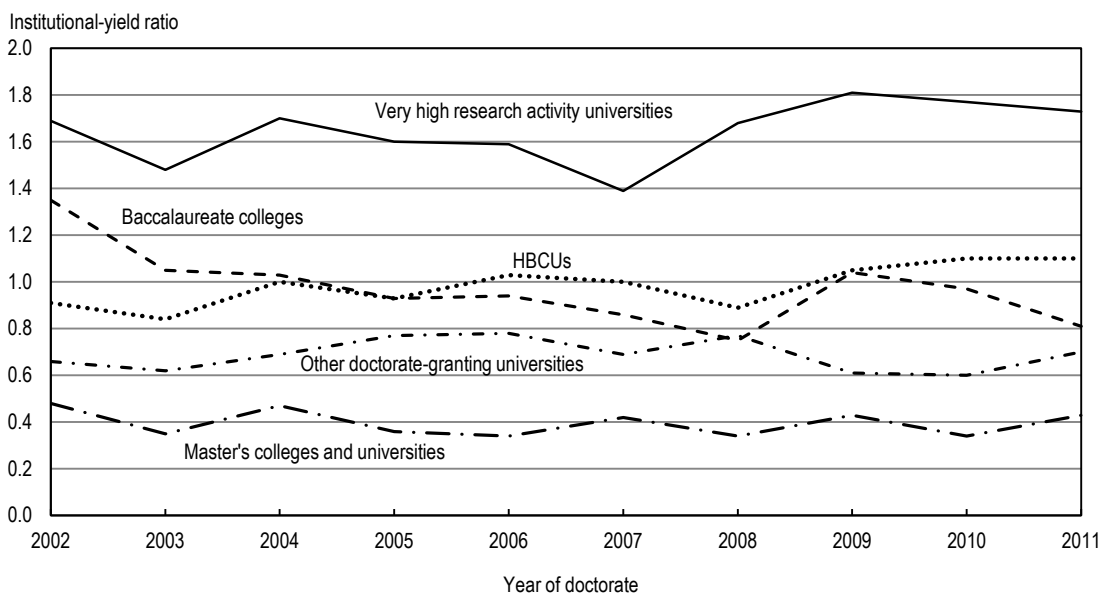
^a Includes agricultural, biological, biomedical, and health sciences.

^b Includes psychology.

NOTES: Includes only U.S. citizens and permanent residents. Institutions with the same number of doctorate recipients are listed alphabetically.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Earned Doctorates.

FIGURE 2. Institutional-yield ratios based on black S&E doctorate recipients, by selected classes of U.S. baccalaureate-origin institutions: 2002–11



HBCU = historically black college or university. S&E = science and engineering; includes health fields.

NOTES: Institutional-yield ratio based on black S&E doctorate recipients is the number of black S&E doctorate recipients per 100 bachelor's degrees awarded in all fields to blacks 9 years earlier. Other doctorate-granting universities include the two other Carnegie categories of doctorate-granting institutions: high research activity and doctoral/research universities. Figure includes only U.S. citizens and permanent residents. HBCUs are excluded from each of the 2010 Carnegie classification groups presented.

SOURCE: National Science Foundation, National Center for Science and Engineering Statistics Survey of Earned Doctorates; Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey.

distributed among three subgroups based on the level of research activity: research universities with very high research activity, research universities with high research activity, and doctoral/research universities (for the purposes of this InfoBrief, the latter two subgroups are combined into a single category, called “other doctorate-granting universities”). Master’s colleges and universities are institutions that award at least 50 master’s degrees and fewer than 20 doctoral degrees per year. Baccalaureate colleges are institutions that award fewer than 50 master’s degrees or 20 doctoral degrees per year and at which baccalaureate degrees are at least 10% of all undergraduate

degrees. See <http://classifications.carnegiefoundation.org/> for more information on the Carnegie classification scheme.

4. Research universities with very high research activity were responsible for 25.6% of all bachelor’s degrees awarded by U.S. academic institutions in 2011, and baccalaureate colleges were responsible for 11.5% of all bachelor’s degrees (U.S. Department of Education, National Center for Education Statistics, Integrated Post-secondary Education Data System, Completions Survey; special tabulation from NSF’s WebCASPAR system [<https://ncesdata.nsf.gov/webcaspar/>], March 2013).

5. Nine years was the median time from receipt of bachelor’s degree to doctorate award for S&E doctorate recipients between 2002 and 2011. Time to degree was shorter in physical sciences (7.7 years) and in engineering (8.0 years) than in life sciences (8.6 years) and social sciences (9.9 years). Explorations of the data with 8- and 10-year lags produced similar results.

6. The analysis in this section is limited to U.S. citizens and permanent residents as data on bachelor’s degrees awarded by race or ethnicity are not provided for temporary residents. In this InfoBrief, “black” is used interchangeably with “black or African American.”

TABLE 8. Top 50 U.S. baccalaureate-origin institutions of 2002–11 black S&E doctorate recipients, by institutional-yield ratio for black S&E doctorate recipients, institutional control, 2010 Carnegie classification, and HBCU status

Rank	Academic institution	Institutional control	2010 Carnegie classification	HBCU	Black S&E doctorate recipients	
					Number	Institutional-yield ratio
1	MA Institute of Technology	Private	Research-very high	No	55	9.6
2	Rice U.	Private	Research-very high	No	25	7.0
3	Princeton U.	Private	Research-very high	No	47	6.5
4	Brown U.	Private	Research-very high	No	55	6.2
5	Yale U.	Private	Research-very high	No	60	6.2
6	Harvard U.	Private	Research-very high	No	71	5.4
7	Vanderbilt U.	Private	Research-very high	No	25	4.6
8	U. MD, Baltimore County	Public	Research-high	No	80	4.4
9	Spelman C.	Private	Baccalaureate	Yes	175	4.2
10	Duke U.	Private	Research-very high	No	49	4.1
11	Johns Hopkins U.	Private	Research-very high	No	25	4.1
12	Cornell U., all campuses	Private	Research-very high	No	51	3.6
13	U. PA	Private	Research-very high	No	43	3.5
14	WA U., St. Louis	Private	Research-very high	No	28	3.5
15	Columbia U. in the City of New York	Private	Research-very high	No	32	3.3
16	Tougaloo C.	Private	Baccalaureate	Yes	44	3.2
17	Tulane U. LA	Private	Research-very high	No	26	3.2
18	Xavier U. LA	Private	Baccalaureate	Yes	126	3.0
19	Stanford U.	Private	Research-very high	No	36	2.9
20	GA Institute of Technology, main campus	Public	Research-very high	No	46	2.7
21	U. CA, Davis	Public	Research-very high	No	31	2.5
22	U. VA, main campus	Public	Research-very high	No	72	2.4
23	Fisk U.	Private	Baccalaureate	Yes	35	2.4
24	U. CA, Berkeley	Public	Research-very high	No	64	2.3
25	Northwestern U.	Private	Research-very high	No	27	2.3
26	Emory U.	Private	Research-very high	No	25	2.2
27	Morehouse C.	Private	Baccalaureate	Yes	106	2.2
28	U. MI, Ann Arbor	Public	Research-very high	No	73	2.2
29	TX A&M U., main campus	Public	Research-very high	No	36	2.1
30	U. of Miami	Private	Research-very high	No	31	2.0
31	Howard U.	Private	Research-high	Yes	220	2.0
32	U. NC, Chapel Hill	Public	Research-very high	No	62	2.0
33	Hampton U.	Private	Master's granting	Yes	150	1.9
34	U. IL, Urbana-Champaign	Public	Research-very high	No	62	1.8
35	Tuskegee U.	Private	Baccalaureate	Yes	80	1.8
36	Clemson U.	Public	Research-high	No	32	1.8
37	U. DE	Public	Research-very high	No	25	1.8
38	PA State U., main campus	Public	Research-very high	No	42	1.8
39	NC State U., Raleigh	Public	Research-very high	No	50	1.7
40	LA State U. and A&M C.	Public	Research-very high	No	40	1.7
41	Oakwood U.	Private	Baccalaureate	Yes	29	1.7
42	U. at Buffalo	Public	Research-very high	No	29	1.7
43	Morgan State U.	Public	Doctoral/Research	Yes	102	1.6
44	Lincoln U. PA	Public	Master's granting	Yes	34	1.6
45	U. FL	Public	Research-very high	No	54	1.6
46	Dillard U.	Private	Baccalaureate	Yes	35	1.5
47	U. TX, Austin	Public	Research-very high	No	34	1.5
48	U. MD, College Park	Public	Research-very high	No	76	1.5
49	Stony Brook U.	Public	Research-very high	No	28	1.5
50	U. GA	Public	Research-very high	No	36	1.5

HBCU = historically black college or university. S&E = science and engineering; includes health fields.

NOTES: Institutional-yield ratio for black S&E doctorate recipients is the number of black S&E doctorate recipients per 100 bachelor's degrees awarded in all fields to blacks 9 years earlier. Table includes only U.S. citizens and permanent residents. Only institutions from which 25 or more baccalaureate recipients received S&E doctorate degrees between 2002 and 2011 were included in the analysis. Institutions are ranked on unrounded ratios.

SOURCES: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Earned Doctorates; U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey.

RETURN THIS COVER SHEET TO ROOM P35 IF YOU
DO NOT WISH TO RECEIVE THIS MATERIAL OR
IF CHANGE OF ADDRESS IS NEEDED INDICATE
CHANGE INCLUDING ZIP CODE ON THE LABEL (DO
NOT REMOVE LABEL).

National Science Foundation
ARLINGTON, VA 22230
OFFICIAL BUSINESS

NSF 13-323