

Physics Bachelor's Degrees

Results from the 2014 Survey of Enrollments and Degrees

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**REPORTS ON
PHYSICS
BACHELORS**

Physics Bachelors Initial
Employment (June 2015)

**Physics Bachelor's
Degrees (November 2015)**

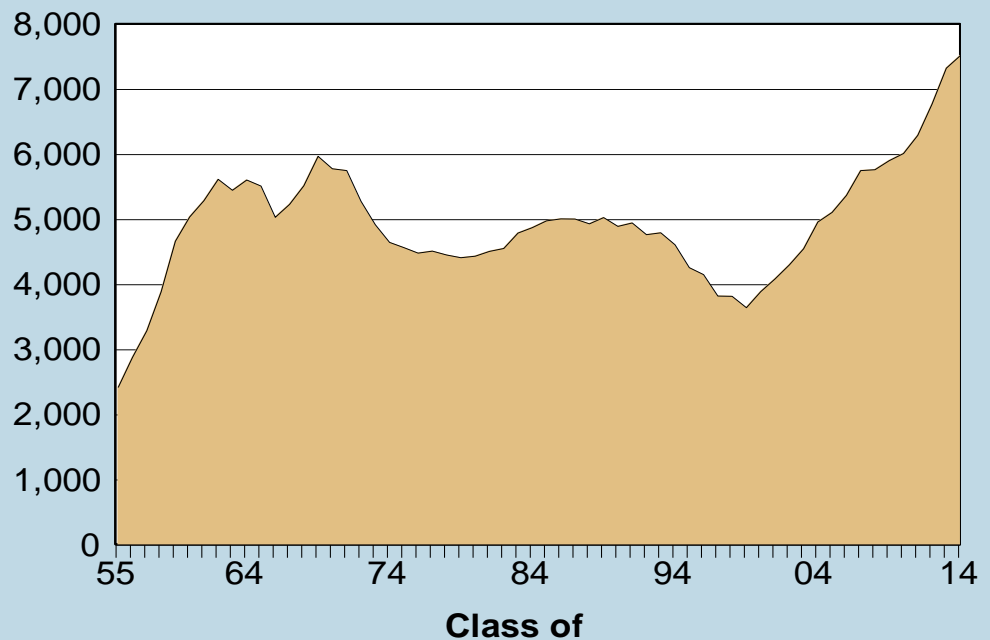
Physics Bachelors: Women
and Minorities
(forthcoming)

The number of physics bachelor's degrees awarded at US institutions has been increasing for the last 15 years, averaging about a 5% increase a year. The 7,526 physics bachelor's degrees awarded in the class of 2014 represent a 106% increase from a recent low seen in the class of 1999 (**Figure 1**).

Figure 1

**Physics Bachelor's Degrees Awarded in the US,
Classes of 1955 through 2014.**

Number



<http://www.aip.org/statistics>

The number of physics bachelor's degrees conferred has more than doubled since the recent low in 1999.

**THE SURVEY OF
ENROLLMENTS AND DEGREES**

Each year, degree-granting physics departments are contacted in the fall and asked to provide their departmental counts of degrees conferred.

Table 1

Demographic Profile of Physics Bachelors, Class of 2014.

Gender:	Men	80%
	Women	20
Citizenship:	US	94%
	Non-US	6
Age*:	Median	22.4
	24 or Older	17%

*Data from the AIP Follow-up Survey of Physics Bachelors, class of 2014.

<http://www.aip.org/statistics>

6% of the physics bachelors conferred in the class of 2014 were awarded to non-US citizens.

The physics bachelor's degree recipient class of 2014 was comprised of 20% women and 94% US citizens (**Table 1**). The proportion of non-US citizens among physics bachelors has remained between 5% and 8% for the 2 decades that this survey has been collecting data on the citizenship of physics bachelor's degree recipients.

A future *focus on* will cover in greater detail the representation of women and minorities.

Thirty-six percent of the physics bachelors in the combined classes of 2013 and 2014 reported having a double major (**Table 2**). This is far greater than 5% for all bachelors nationally⁽¹⁾. The subjects that physics bachelors chose to double major in were quite diverse, with both STEM and non-STEM fields represented. Mathematics represented the largest proportion of second majors for physics bachelors. Additionally, a significant proportion of physics bachelors

(1) Calculated with data from the US Department of Education, Institute of Education Sciences, National Center for Education Statistics.

graduated with a minor. About a quarter of the degree recipients with a double major also had a minor and half of those without a double major graduated with a minor. By far, mathematics represented the largest proportion of subjects for those graduating with a minor. Ultimately, 35% of physics bachelors indicated having either a double major or minor with mathematics.

In addition to a traditional physics bachelor's degree, many physics departments offer their undergraduates an option to have a curricular focus to their physics major. In the combined classes of 2013 and 2014, about a quarter of physics bachelors indicated that their degrees had a particular focus (**Table 2**). An engineering or applied physics focus was cited most frequently, with 10% of graduates indicating graduating with such a degree.

Table 2

**Education Characteristics of Physics Bachelors,
Classes of 2013 and 2014 Combined.**

Graduated with a double major*	36%
Graduated with a minor*	42%
Did not graduate with a double major or a minor	32%
Focus of Physics Bachelor's Degree:	
Traditional degree	76%
Engineering or Applied Physics	10%
Astrophysics	5%
Biophysics	3%
High School Teaching	2%
Other Focus	4%

Physics bachelors have broad interests, with 36% graduating with a double major.

The data in this table comes from the AIP Follow-up Survey of Physics Bachelors, classes of 2013 and 2014 combined.

*Ten percent of physics bachelors graduated with both a double major and a minor.

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Table 3

Number and Size of Physics Bachelor's Programs by Highest Degree the Department Offered, Class of 2014.

Highest physics degree offered by department	Number of depts.	Percent of depts.	Physics bachelor's degrees by type of department		
			Percent of degrees	Average	Median
Bachelors	496	67	42	6.4	5
Masters	56	7	6	8.5	7
PhD	191	26	52	20.4	15

There are an additional 8 PhD-granting physics departments that do not offer a bachelor's degree.

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Doctoral-granting physics departments comprised only 26% of all degree-granting physics departments in 2014, but they were responsible for producing 52% of the physics bachelors conferred.

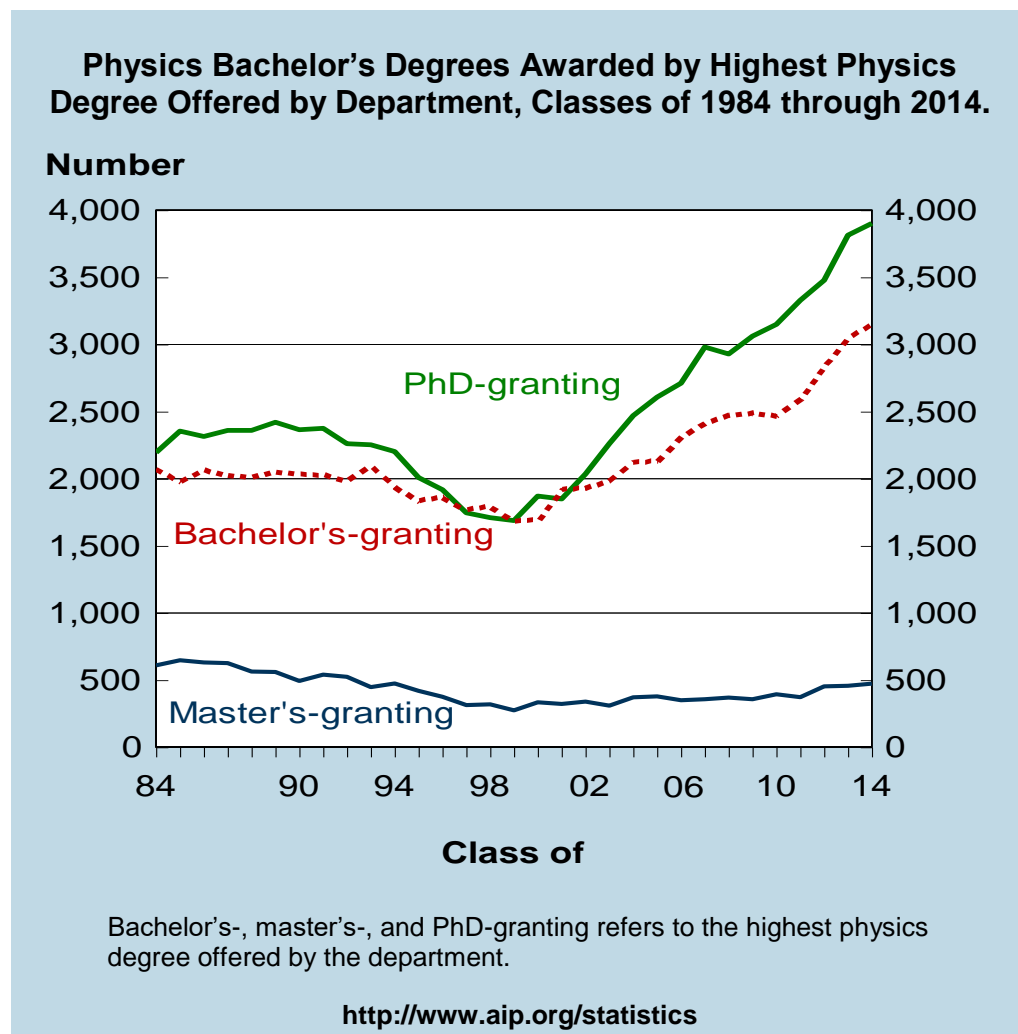
In the academic year 2013-14, there were 751 degree-granting physics departments in the United States. Eight of these departments did not offer an undergraduate degree in physics. The undergraduate programs at physics departments that have a doctoral program tend to be considerably larger than departments that offer a masters or bachelors as their highest degree. On average, doctoral-granting physics departments confer more than three times the number of bachelor's degrees than departments where the highest physics degree available is the bachelors (**Table 3**).

The increase in physics bachelor's degree production differs by highest degree offered by the department. The 191 doctoral-granting physics departments with undergraduate programs conferred the majority of the bachelor's degrees awarded in 2014, and as a group, have experienced the

greatest gains (**Figure 2**). A small proportion, less than 10%, of the increase in bachelor's degrees conferred at PhD-granting departments is a result of a net increase of 14 departments that began awarding both a bachelors and PhD during this time period. The increase in the number of PhD-granting departments is offset by a decline in the number of bachelor's- and master's-granting departments. These departments either increased their offerings to include a PhD or no longer have a degree-granting physics program. Since 1999 there has been a net loss of 11 degree-granting physics departments.

Not all physics departments have experienced an increase in the number of degrees they conferred. Since the late 1990's when physics bachelors production started its recent rise, about a fifth of departments either declined or had no change in the number of physics bachelor's degrees they produced.

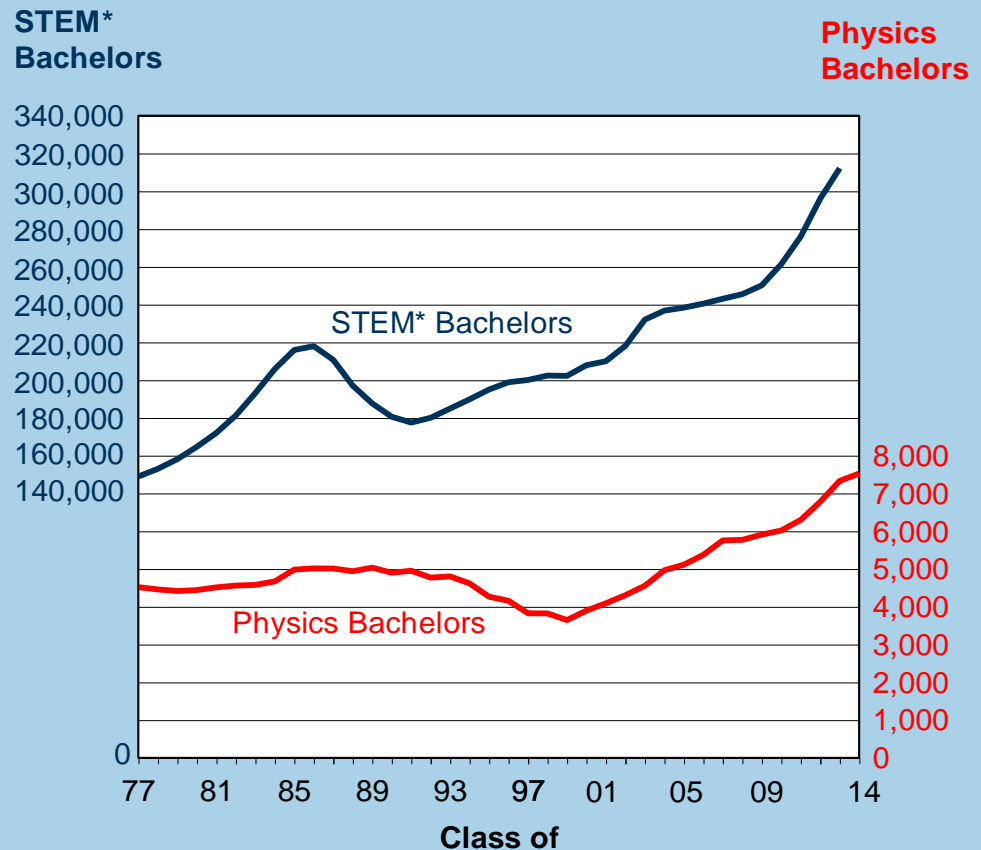
Figure 2



The greatest gains in the number of physics bachelors awarded have been at PhD-granting departments that offer undergraduate degrees. Degree production at these departments is up 131%.

Figure 3

Physics Bachelors and STEM* Bachelors Produced in the US, 1977 through 2014.



*STEM (science, technology, engineering, and mathematics) includes mathematics, physical science, biological sciences, geosciences, engineering/engineering technologies, science technologies, and computer/information sciences. Source for STEM degrees: NCES Digest of Education Statistics

<http://www.aip.org/statistics>

The increase in the number of physics bachelor's degrees conferred in recent years has occurred at the same time that STEM degrees in general have been on the rise.

Physics bachelors comprise about 2.3% of all STEM degrees conferred.

The trend of increasing bachelor's degree production is not unique to physics. The total number of bachelor's degrees awarded in the US, including the number of STEM bachelor's degrees, has also been on the rise (Figure 3).

Although substantial, the rate at which STEM degrees have risen is considerably less than for physics bachelors. Physics bachelor's degrees more than doubled (106% increase) since 1999, while STEM degrees only increased 54% during that same time period.

Physics departments where the bachelor's degree is the highest degree offered vary greatly in size. They conferred an average of 6.4 bachelors in the classes of 2012, 2013 and 2014 combined. Most departments (78%) increased their bachelor's degree production in recent years. Even with an overall trend of conferring more bachelors, many programs are still relatively small, with about 50% averaging fewer than 5 degrees per year in the classes of 2012, 2013 and 2014 combined (**Figure 4**).

There were 90 bachelor's-only physics departments that awarded an average of 10 or more physics degrees per year in the classes of 2012, 2013, and 2014 combined. There are three and a half times more departments in this 10 or more category than there were 15 years ago, when the number of physics bachelor's degrees was at a low point.

Figure 4

Number of Bachelor's-Only Departments by the Average Number of Physics Bachelors Conferred per Year, Classes of 2012 through 2014.

Number of departments

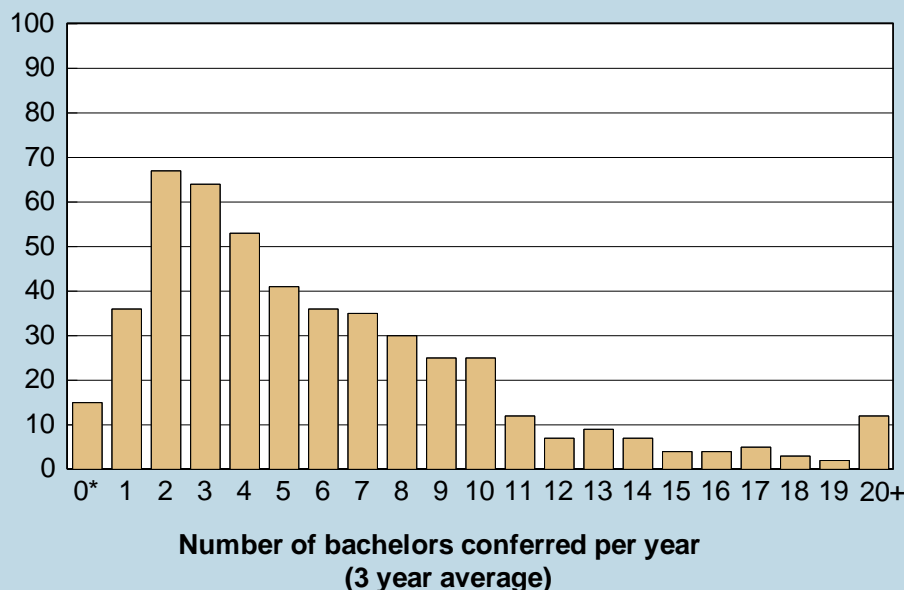


Figure includes 492 departments where the bachelors was the highest physics degree offered in 2014 and were degree-granting for all three years. Data were estimated for non-responding departments.

* Includes 10 departments who conferred one bachelor's degree during the 3 year period.

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A relatively small group (18%) of bachelor's-only departments averaged 10 or more physics bachelors. These same departments awarded 43% of the physics bachelors conferred by the bachelor's-only departments.

About half of the departments that offer a bachelors as their highest physics degree averaged fewer than 5 degrees a year.

Table 4

**Bachelor's-Only Departments Averaging 10 or More Physics Bachelor's Degrees Per Year,
Classes of 2012 through 2014.**

	Annual Avg.		Annual Avg.		Annual Avg.
SUNY College, Geneseo (NY)	36	Kutztown U (PA)	15	Kettering U (MI)	11
Cal Poly St U, San Luis Obispo	30	U of Wisconsin, River Falls	15	Salisbury U (MD)	11
Saint Olaf College (MN)	29	Central Washington U	14	Taylor U (IN)	11
US Naval Academy (MD)	29	Fordham U (NY)	14	Truman State U (MO)	11
U of Wisconsin, La Crosse	27	Grinnell College (IA)	14	U of Puerto Rico, Humacao	11
Western Washington U (WA)	26	Kalamazoo College (MI)	14	Weber State U (UT)	11
Rowan U (NJ)	24	Middlebury College (VT)	14	Austin Peay State U (TN)	10
Reed College (OR)	23	Oberlin College (OH)	14	Bates College (ME)	10
The College of New Jersey	23	Towson U (MD)	14	Beloit College (WI)	10
U of Wisconsin, Eau Claire	22	College of Charleston (SC)	13	Bloomsburg U (PA)	10
Carleton College (MN)	20	Ithaca College (NY)	13	Coll. of the Holy Cross (MA)	10
Harvey Mudd College (CA)	19	Macalester Coll (MN)	13	Furman U (SC)	10
Whitworth U (WA)	19	Middle Tennessee State U	13	Gettysburg College (PA)	10
Bethel U (MN)	18	US Air Force Academy (CO)	13	Hamilton College (NY)	10
Williams College (MA)	18	U of Richmond (VA)	13	Juniata College (PA)	10
Bowdoin College (ME)	17	Colgate U (NY)	12	Lewis & Clark College (OR)	10
Gustavus Adolphus Coll (MN)	17	Illinois Wesleyan U	12	Morehouse College (GA)	10
Illinois State U	17	Pomona College (CA)	12	Mount Holyoke College (MA)	10
U of North Georgia	17	Siena College (NY)	12	U of Central Arkansas	10
Angelo State U (TX)	16	SUNY College, Oneonta (NY)	12	U of Northern Colorado	10
Brigham Young U (ID)	16	US Military Academy (NY)	12	U of Puget Sound (WA)	10
James Madison U (VA)	16	Amherst College (MA)	11	U of Wisconsin, Platteville	10
Rochester Inst of Tech (NY)	16	College of Wooster (OH)	11	U of Wisconsin, Whitewater	10
Colby College (ME)	15	East Tennessee State U	11	Utah Valley U (UT)	10
Colorado College (CO)	15	Eastern Illinois U	11		

List includes only those departments that offered a bachelors as their highest physics degree in 2014 and contributed degree data for all 3 years.

<http://www.aip.org/statistics>

Figure 5

Number of Master's-Granting Departments by the Average Number of Physics Bachelors Conferred per Year, Classes of 2012 through 2014.

Number of departments

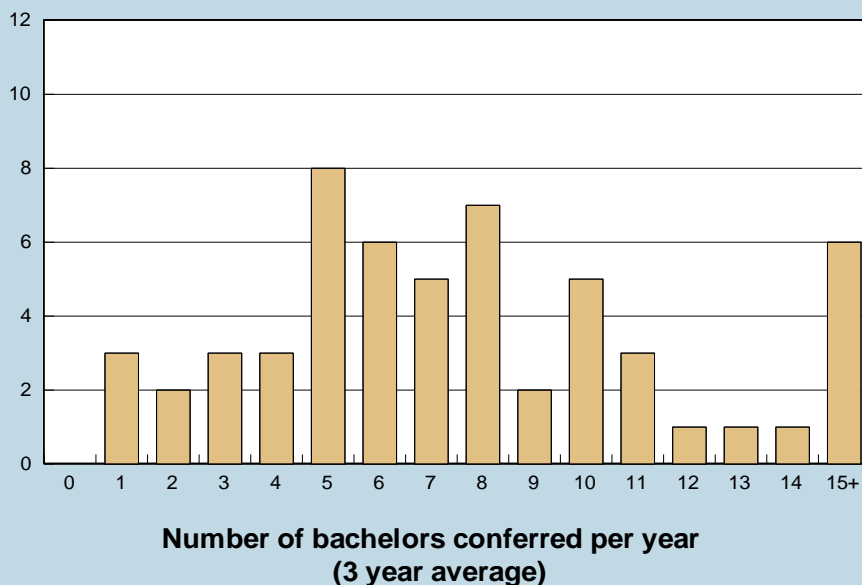


Figure includes 56 departments where the masters was the highest physics degree offered in 2014. Data were estimated for non-responding departments.

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11 of the 56 departments that offer a masters as their highest physics degree averaged fewer than 5 bachelor's degrees in the classes of 2012 through 2014.

Departments that offered a masters as their highest physics degree conferred an average of 8.5 physics bachelor's degrees for the classes of 2012 through 2014. Eleven of the master's-granting physics departments averaged fewer than five bachelor's degrees during the three-year period (**Figure 5**).

Table 5

Master's-Granting Departments Averaging 7 or More Physics Bachelor's Degrees Per Year, Classes of 2012 through 2014.

	Annual Average		Annual Average
Northern Arizona U	26	DePaul U (IL)	9
Appalachian State U (NC)	19	San Jose State U (CA)	9
Virginia Commonwealth U	19	Cal State U, Northridge	8
Cal State U, Long Beach	18	Eastern Michigan U	8
Miami U (OH)	17	U of Massachusetts, Dartmouth	8
San Francisco State U	16	Western Kentucky U	8
(CUNY) City College (NY)	12	Creighton U (NE)	7
Christopher Newport U (VA)	11	San Diego State U (CA)	7
U of Texas, El Paso	11	Southern Connecticut State U	7
Stephen F. Austin State U (TX)	10	U of Memphis (TN)	7
U of Colorado, Colorado Springs	10	U of Texas, Brownsville	7
U of Massachusetts, Boston	10		

List includes only departments that offered a masters as their highest physics degree in 2014 and contributed degree data for all 3 years.

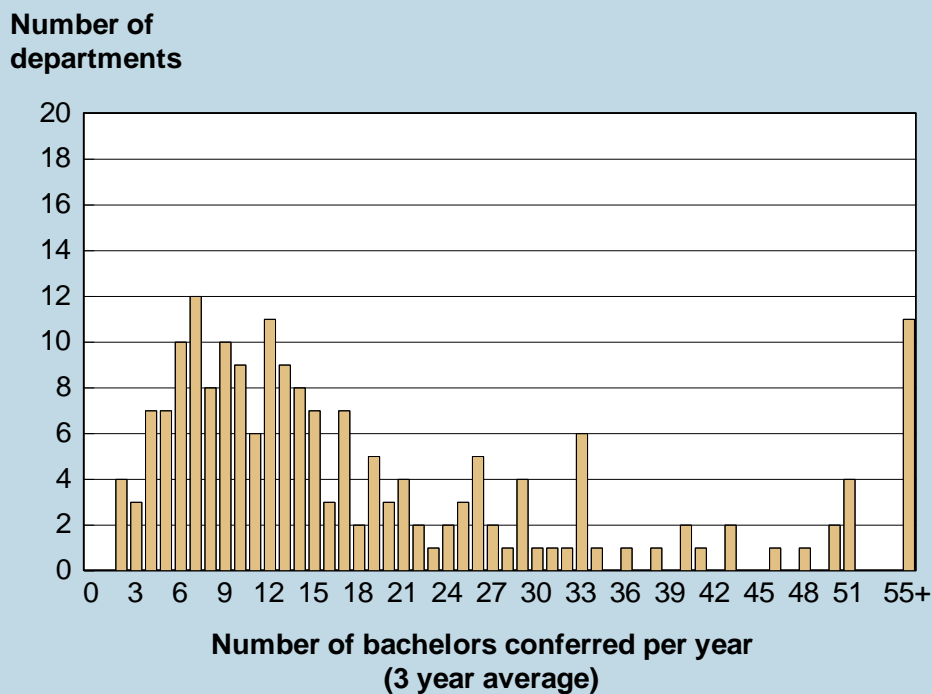
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There were 56 departments that offered a masters as their highest physics degree in the class of 2014. The number of departments with this degree-level status has been steadily declining, with an average loss of over one department a year for the last 30 years. These departments typically continue to offer physics degrees, but change their highest degree offered status by increasing their degree offerings to include a PhD or by scaling back to only offering a bachelor's degree.

Compared to the undergraduate programs at bachelor's- and master's-granting physics departments, departments that also offer a PhD have a considerably wider range in the size of their undergraduate programs. These departments averaged 20.4 bachelor's degrees in the classes of 2012 through 2014. A few undergraduate programs at doctoral-granting departments are relatively small, with 14 departments averaging fewer than 5 bachelors a year. In contrast, there were 60 departments that averaged more than 20 bachelors, with 17 departments conferring 50 or more (Figure 6).

Figure 6

Number of Doctoral-Granting Departments by the Average Number of Physics Bachelors Conferred per Year, Classes of 2012 through 2014.



There were 17 doctoral-granting physics departments that averaged 50 or more bachelor's degrees in the classes of 2012 through 2014. These few very large departments were responsible for awarding 15% of all physics bachelors conferred during this time period.

Figure includes 191 departments where the PhD was the highest physics degree offered in 2014. Data were estimated for non-responding departments.

<http://www.aip.org/statistics>

Table 6

PhD-Granting Departments Averaging 20 or More Physics Bachelor's Degrees Per Year, Classes of 2012 through 2014.

	Annual Average		Annual Average
U of Washington	98	SUNY, Stony Brook (NY)	33
Mass. Inst. of Technology (MIT)	92	U of Florida	33
U of California, Berkeley	85	U of Utah	32
U of Texas, Austin	71	U of Wisconsin, Madison	31
U of California, Santa Barbara	65	Yale U (CT)	30
U of Maryland, College Park	59	Brown U (RI)	29
U of Colorado, Boulder	58	Georgia Inst of Tech	29
Rutgers U, New Brunswick (NJ)	57	U of Massachusetts, Amherst	29
U of California, Los Angeles	56	U of North Carolina, Chapel Hill	29
Colorado School of Mines	55	U of Notre Dame (IN)	28
Ohio State U	51	California Inst of Technology	27
Pennsylvania State U	51	Princeton U (NJ)	27
U of Chicago (IL)	51	Boston U (MA)	26
U of Virginia	51	SUNY-U at Albany (NY)	26
Brigham Young U (UT)	50	U of Arkansas, Fayetteville	26
U of California, Santa Cruz	50	U of Oregon	26
Harvard U (MA)	48	U of California, Irvine	25
Rensselaer Polytech Inst (NY)	46	Washington U (MO)	25
U of Michigan, Ann Arbor	43	Case Western Reserve U (OH)	24
U of Minnesota, Minneapolis	43	U of Arizona	24
U of California, San Diego	41	U of Rochester (NY)	23
Arizona State U	40	Johns Hopkins U (MD)	22
U of California, Davis	40	Virginia Polytech Inst & State U	22
Michigan State U	38	Stanford U (CA)	21
Cornell U (NY)	36	U of Central Florida	21
Purdue U, West Lafayette (IN)	34	U of Pennsylvania	21
Carnegie Mellon U (PA)	33	Louisiana State U, Baton Rouge	20
Columbia U (NY)	33	Texas A&M, College Station	20
North Carolina State U	33	U of California, Riverside	20

List includes only departments that offered a PhD as the highest physics degree in 2014 and contributed degree data for all 3 years.

<http://www.aip.org/statistics>

Table 7

Appendix 1. Physics Bachelor's Degrees Conferred, Classes of 1994 through 2014.

Academic year	Total	Highest physics degree offered by department		
		Bachelors	Masters	PhD
1994-1995	4,263	1,834	420	2,009
1995-1996	4,156	1,862	376	1,918
1996-1997	3,826	1,766	314	1,746
1997-1998	3,821	1,791	320	1,710
1998-1999	3,646	1,683	275	1,688
1999-2000	3,894	1,688	335	1,871
2000-2001	4,091	1,919	323	1,849
2001-2002	4,305	1,929	340	2,036
2002-2003	4,553	1,981	310	2,262
2003-2004	4,965	2,123	372	2,470
2004-2005	5,113	2,126	379	2,608
2005-2006	5,373	2,311	350	2,712
2006-2007	5,755	2,416	358	2,981
2007-2008	5,769	2,470	370	2,929
2008-2009	5,908	2,488	358	3,062
2009-2010	6,017	2,472	395	3,150
2010-2011	6,296	2,594	373	3,329
2011-2012	6,776	2,844	454	3,478
2012-2013	7,329	3,057	458	3,814
2013-2014	7,526	3,151	474	3,902

<http://www.aip.org/statistics>

About the Survey

Each fall the Statistical Research Center conducts its Survey of Enrollments and Degrees. The survey is sent to all degree-granting physics and astronomy departments in the US and Puerto Rico. Departments are asked to provide information concerning the number of students they currently have enrolled and the number of degrees they conferred in the previous academic year. We define the academic year as being from September to August.

In the 2013-14 academic year, 743 departments offered bachelor's degrees in physics. We received responses from 90% of these departments. Estimates were derived and included in the totals for the non-responding departments.

Data from this survey are also used to produce the "Roster of Physics Departments," which provides a department-level enrollment and degree snapshot. Copies of the Rosters can be found at: <http://www.aip.org/statistics/reports/roster-physics-2014>

In the 2013-14 academic year, there were 72 departments that offered a bachelor's degree in astronomy. About half of these departments are administered as part of a physics and astronomy department with the remainder administered as separate departments. Data concerning astronomy bachelors from the combined departments are collected separately from physics, combined with the data from the separate astronomy departments, and reported in a separate *focus on*.

These reports are possible because of the efforts of department chairs, faculty, and staff in providing their departmental data to the AIP year after year. We thank them for their ongoing support of this survey series.

e-Updates

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Career Resources

The American Institute of Physics has a Career Resources page (<http://www.aip.org/career-resources>) that centralizes an array of career-related information for the physical science community. Content includes career advice, the latest science and engineering job opportunities, employment statistics, fellowship information, and science education and career path recommendations.