

Number of Physics Faculty Members

Results from the 2010 Survey of Physics Degree-Granting Departments

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Number of Faculty Members Grows

The 758 physics degree-granting departments employed about 9,400 full-time equivalent (FTE) faculty members during the 2009-2010 academic year. (The year in the table refers to the spring semester; for example, 2000 represents the 1999-2000 academic year.) The number of physics departments granting doctorates is up by three since the 2007-08 academic year, while the number of physics departments granting a bachelor's as their highest degree is down by eight. Even with a decrease in the number of bachelor's granting departments, the number of faculty members still increased (Table 1).

Table 1

**Total Full-Time Equivalent (FTE) Faculty Members
in Physics Departments
by Highest Degree Awarded**

Highest Degree Awarded	Year		
	2000	2008	2010
PhD	5,000 (186)	5,400 (189)	5,600 (192)
Master's	775 (67)	850 (66)	840 (63)
Bachelor's	2,600 (513)	2,900 (511)	2,960 (503)
TOTAL	8,200 (766)	9,100 (763)	9,400 (758)

(Number of departments in parentheses)

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**THE 2010 ACADEMIC
WORKFORCE SURVEY**

During the spring semester of
2010, we contacted all of the
departments in the US that
offered at least a bachelor's
degree in physics or astronomy.

In physics departments that grant a PhD, the average number of faculty members per department has returned to 2004 levels, near the recent peak of 29.3 seen in 2006. Departments that offer a master's degree as the highest degree average 13.3 faculty members each. This is the highest level seen in the last ten years, as is the average of 5.9 faculty members in departments which do not offer graduate degrees. As the highest degree offered moves from a bachelor's degree to a master's degree and then to a PhD, the average number of faculty members increases by about 220% at each step. This ratio has held fairly constant over the last decade.

Table 2**Average Number of FTE Physics Faculty Members per Department
by Highest Degree Awarded**

Year	Highest Degree		
	PhD	Master's	Bachelor's
2000	26.9	11.6	5.1
2002	28.0	12.3	5.5
2004	29.2	12.5	5.4
2006	29.3	12.9	5.7
2008	28.6	12.7	5.7
2010	29.2	13.3	5.9

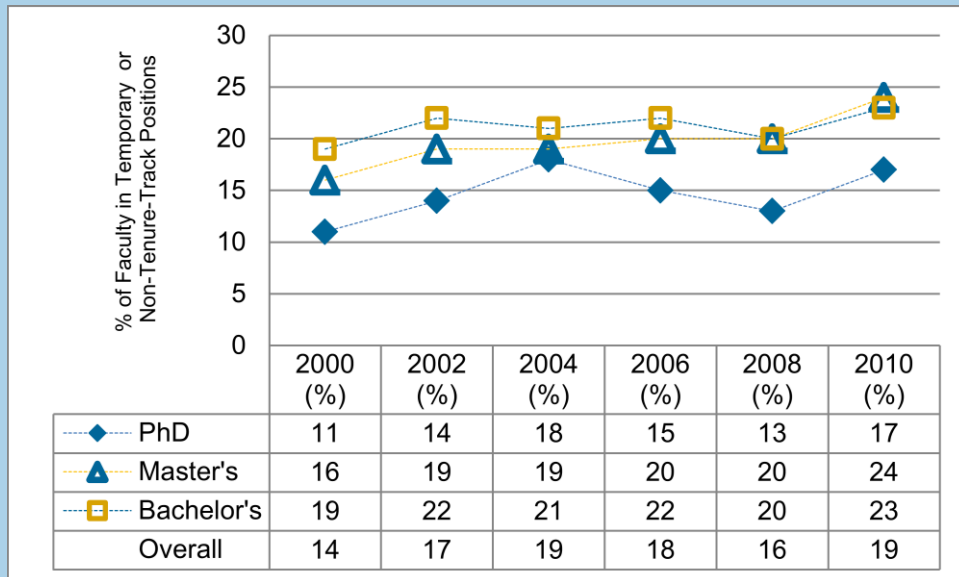
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The average number of faculty members per department is at or near decadal highs.

Between 2000 and 2010, the average number of FTE faculty members in physics departments that award a doctorate grew at a compounded annual rate of 0.8%. This is slower than the 1.4 to 1.5% compounded annual rate exhibited in the average number of FTE faculty members in master's- and bachelor's- degree granting departments. Although they are faster-growing, master's and bachelor's physics departments have a higher percentage of faculty members employed in non-tenured or temporary positions (Figure 1).

Figure 1

Percent of Full-Time Equivalent Physics Faculty Members Employed in Temporary or Non-Tenure-Track Positions By Highest Degree Awarded



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The percent of FTE physics faculty employed in temporary or non-tenure-track positions increased in 2010.

Temporary & Non-Tenure Track Faculty

Overall, about 19% of physics FTE faculty members are employed in temporary or non-tenure-track positions. The last time the overall level was this high was in 2004. About one faculty member in four at master’s-granting departments was in a temporary (including soft money) or non-tenure-track position; the situation in departments that award a bachelor’s as the highest degree was about the same. These are the highest levels seen since 2000. These high levels might be attributable to the current budgetary situation. Institutions may not permit departments to offer tenured or tenure-track positions in this uncertain economic environment, so we might see this percentage continue to grow. Alternatively, as noted in our last report, these positions are also the easiest positions to cut; therefore, we might see a decline. We will continue to track these data in upcoming years.

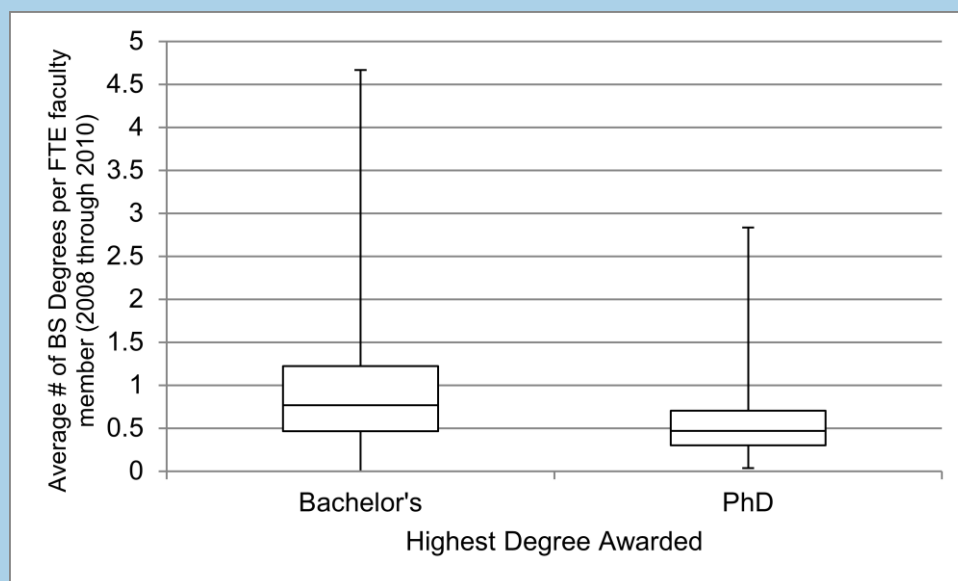
Distribution of Faculty and Bachelor's Degrees

Nearly 70% of physics departments that award a bachelor's degree as their highest degree average 5 or fewer graduates per year.¹ There is a relationship between the number of faculty members and the number of degrees awarded. As expected, physics departments with more faculty members typically award more bachelor's degrees. Furthermore, as we have seen in Table 2, departments that award graduate degrees have more faculty members than those that award a bachelor's degree only.

Even though PhD-granting departments comprised just 25% of all degree-granting physics departments in 2008, these departments produced over half of the physics bachelor's graduates that year.² This is typical. The FTE numbers are similar, with PhD-granting departments accounting for about 60% of the FTE faculty members in physics.

Figure 2

Average Number of Bachelor's Degrees Awarded per FTE Faculty Member in Physics Departments, AY 2008 through 2010
By Highest Degree Awarded



The box depicts the middle 50% of departments with the line at the median, and the bars extend to the maxima and minima.

Faculty members at PhD-granting departments also work with graduate students; graduate degrees per faculty member are not reflected in this figure.

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About 75% of the physics departments that offer a bachelor's as their highest degree produce more than 0.5 bachelor's degrees per faculty member per year; this is true for about 50% of the PhD-granting departments.

¹ *focus on Size of Undergraduate Programs*, by P. Mulvey, S. White, and R. Ivie, February 2010, Statistical Research Center, AIP, accessed February 3, 2012.

² *focus on Physics Undergraduate Degrees*, by P. Mulvey and S. Nicholson, May 2011, Statistical Research Center, AIP, accessed March 7, 2012.

The Texas Higher Education Coordinating Board recently rescinded degree-granting status to physics departments at several state institutions after determining they were “low-producing” degree programs.³ Decisions such as these disproportionately affect bachelor’s-granting physics departments, which actually are relatively efficient at producing physics bachelors. Figure 2 (on page 4) depicts the average bachelor’s degree production per faculty member for physics departments that grant bachelor’s degrees only and those that award doctorates. Given that bachelor’s granting departments often produce more physics bachelors with fewer faculty members, their role in the production of scientifically-trained workers who contribute to the US economy should not be underestimated.

Table 3

Average Number of FTE Physics Faculty Members per Department and Bachelor’s Degree Production AY 2008 through 2010 by Highest Degree Awarded

FTE faculty members & Degree production	Highest Degree	
	Bachelor’s	PhD
Departments with < 10 FTE faculty members	87% of departments	3% of departments
Of these, % that average < 5 bachelor’s degrees per year	64%	50%
Departments with 10 to 20 FTE faculty members	12% of departments	27% of departments
Of these, % that average < 5 bachelor’s degrees per year	33%	34%
Departments with more than 20 FTE faculty members	1% of departments	70% of departments
Of these, % that average < 5 bachelor’s degrees per year	none	6%

The bachelor’s-granting departments produce fewer bachelor’s degrees because they have fewer faculty members, not because they are less productive.

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

³“Higher ed board cuts physics degrees at TSU and Prairie View A&M,” by M. Ludwig, *Houston Chronicle*, October 27, 2011, accessed February 3, 2012.

Table 3 (on page 5) shows the disparity in the size of the departments in bachelor's- and PhD-granting physics departments and depicts the consequences of applying the "average 5 per year" rule. Even though the bachelor's granting departments are typically more productive (Figure 2 on page 4), over half of them would be adversely affected.

Survey Methodology

Between March and July 2010, we contacted each of the 758 departments that awarded at least a bachelor's degree in physics by e-mail, mail, and certified mail. Follow-up contacts were made for departments that had not yet responded. We received responses from 707 departments (93%). We offer our sincere gratitude to the responding departments. Without your help, we could not track these data.