

Physics Enrollments

Results from the 2008 Survey of Enrollments and Degrees

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**REPORTS ON
ENROLLMENTS
AND DEGREES**

R-151.45

Astronomy Enrollments
and Degrees (July 2010)

**Physics Enrollments
(February 2011)**

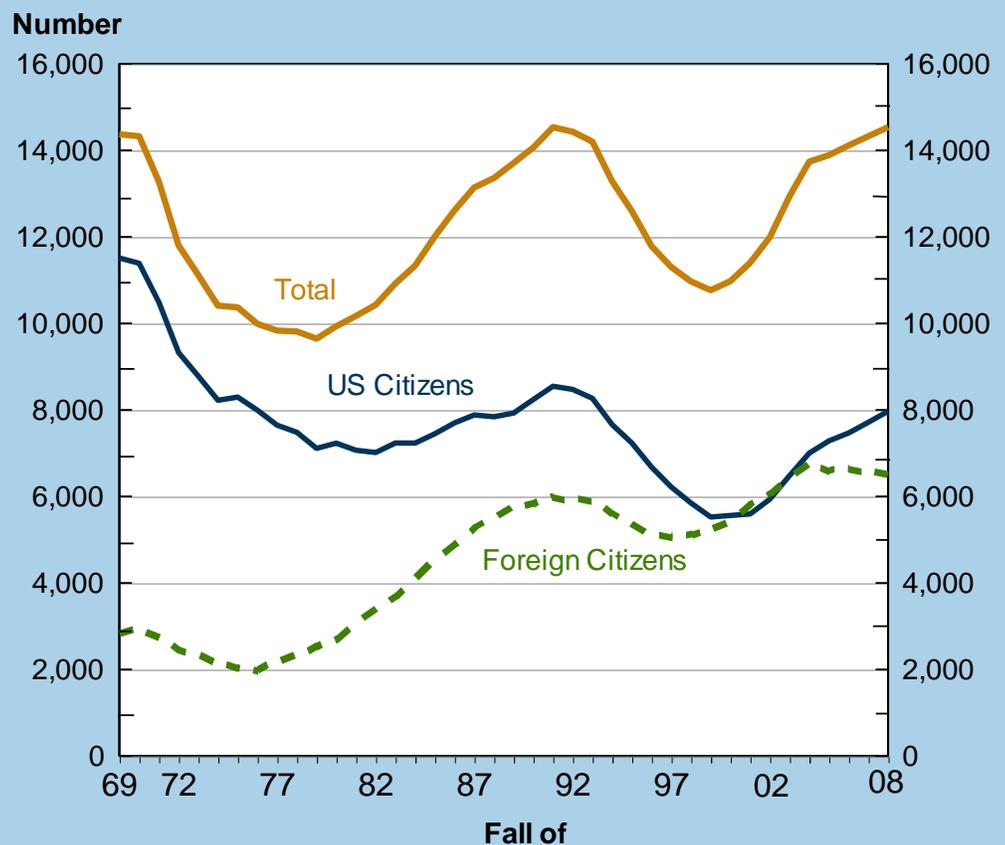
Physics Undergraduate
Degrees (May 2011)

Physics Graduate
Degrees (July 2011)

The number of graduate students enrolled in physics programs in the US during the fall of 2008 was the highest since 1991. The number of US citizens enrolled in graduate programs has been steadily increasing since the early 2000's totaling around 8,000 students in the fall of 2008. The number of foreign graduate students enrolled in US graduate physics programs has remained at around 6,600 students for the last 5 years.

Figure 1

Graduate physics student enrollments, fall 1969 through fall 2008.



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

Total graduate student enrollments continue to rise, increasing 34% since a low in the fall of 1999.

**THE 2008 SURVEY OF
ENROLLMENTS AND DEGREES**

Each year, U.S. degree-granting physics departments are contacted in the fall and asked to provide their departmental enrollments.

Table 1**Number of degree-granting physics departments,
academic year 2007-08.**

| Highest physics degree offered | Number of Depts. | Percent of Depts. |
|--------------------------------|------------------|-------------------|
| Bachelor's-granting | 511 | 67 |
| Master's-granting | 63 | 8 |
| PhD-granting | 189 | 25 |
| Total | 763 | 100% |

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One quarter, 189 of the 763, degree-granting physics departments offer a PhD as their highest physics degree.

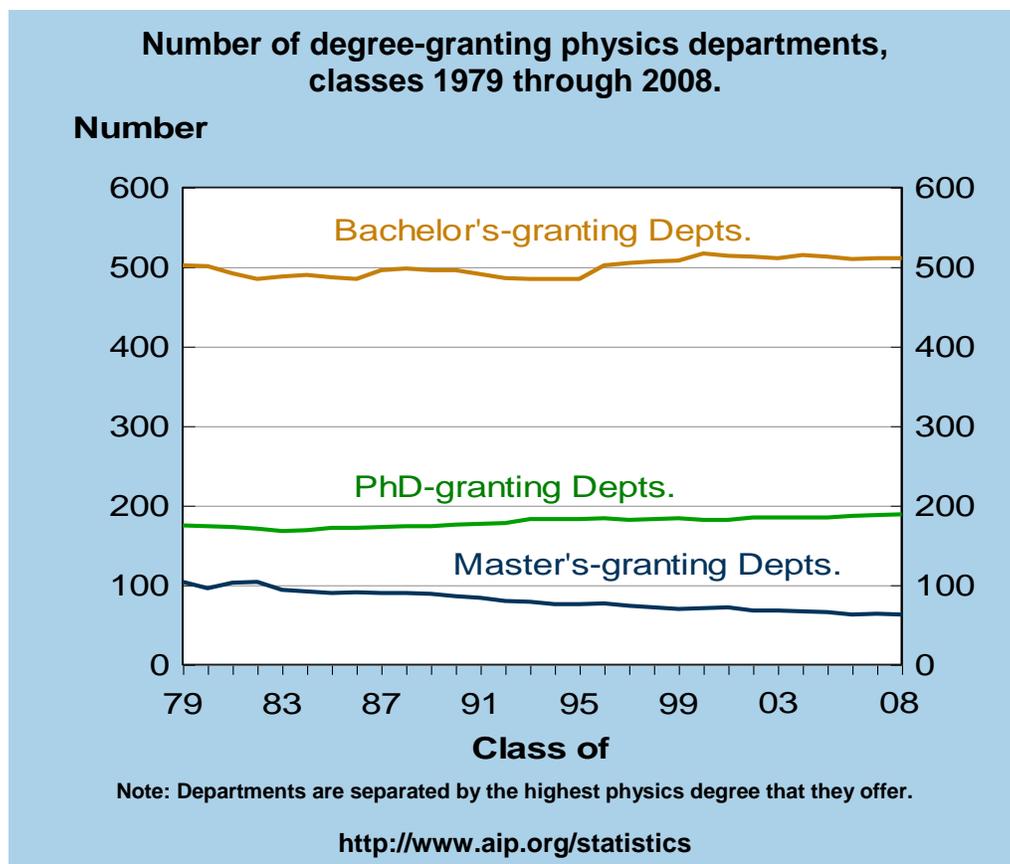
Two-thirds of all physics departments offer a bachelor's as their highest degree. In the academic year 2007-08, there were 252 degree-granting physics departments with graduate programs. Of these, 63 offered the master's as its highest physics degree. These master's departments accounted for 6.5% of the total graduate student enrollment averaging 15 students per department. The doctoral-granting departments tend to be considerably larger and averaged 72 students per department.

Thirty-seven physics departments also offered a degree in astronomy. The departments with astronomy programs were asked to report their astronomy enrollment data separately from their physics data. The data concerning the astronomy students at these departments are published in a separate astronomy "focus on" where they are combined with the data from an additional 38 departments that offer degrees only in astronomy.

The overall number of degree-granting physics departments is basically the same as a decade ago. However there have been some changes in the universe of departments. In any given year, a few programs lose their physics degree-granting status and a few new degree programs begin. During the decade preceding the 2007-08 academic year, 32 colleges or universities suspended or discontinued their degree program in physics. During the same time period, the SRC became aware of 33 colleges or universities that added or reinstated a degree program in physics.

Physics departments also change the highest degree they offer. A department that offered a bachelor's as its highest physics degree may expand its offerings to include a master's. A master's-granting department may expand its offerings to include a PhD, or more commonly, reduce its degree offerings to just the bachelor's. On average three or four departments a year change their level of highest degree. These changes have had a long term net effect of fewer departments offering a master's as their highest physics degree. More than 100 physics departments offered a master's as their highest degree in the early 1980's, but only 63 did so in the academic year 2007-08.

Figure 2



During the last decade there has been virtually no net change in the total number of degree-granting physics departments.

Table 2

Introductory physics course enrollments at physics departments, academic year 2007-08.

| Highest physics degree offered by department | Calculus Based | Algebra Based | Conceptual |
|--|----------------|---------------|------------|
| Bachelor's | 49,000 | 48,000 | 30,000 |
| Master's | 18,000 | 18,000 | 13,000 |
| PhD | 112,000 | 87,000 | 32,000 |
| Total | 179,000 | 153,000 | 75,000 |

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More than 400,000 undergraduates took introductory physics courses in degree-granting physics departments during the 2007-08 academic year.

The number of students taking an introductory physics class at degree-granting physics departments has increased by 28% during the last decade. Although increases have been realized in each type of course offering, the algebra-based course experienced the greatest gains (34%) followed by conceptual physics with a gain of 27%. The calculus-based classes, which continue to have the highest overall enrollments, increased by 23%.

Table 3

Introductory physical science and astronomy course enrollments at physics departments, academic year 2007-08.

| Highest physics degree offered by department | Physical Science | Astronomy |
|--|------------------|-----------|
| Bachelor's | 32,000 | 58,000 |
| Master's | 9,000 | 24,000 |
| PhD | 15,000 | 55,000 |
| Total | 56,000 | 137,000 |

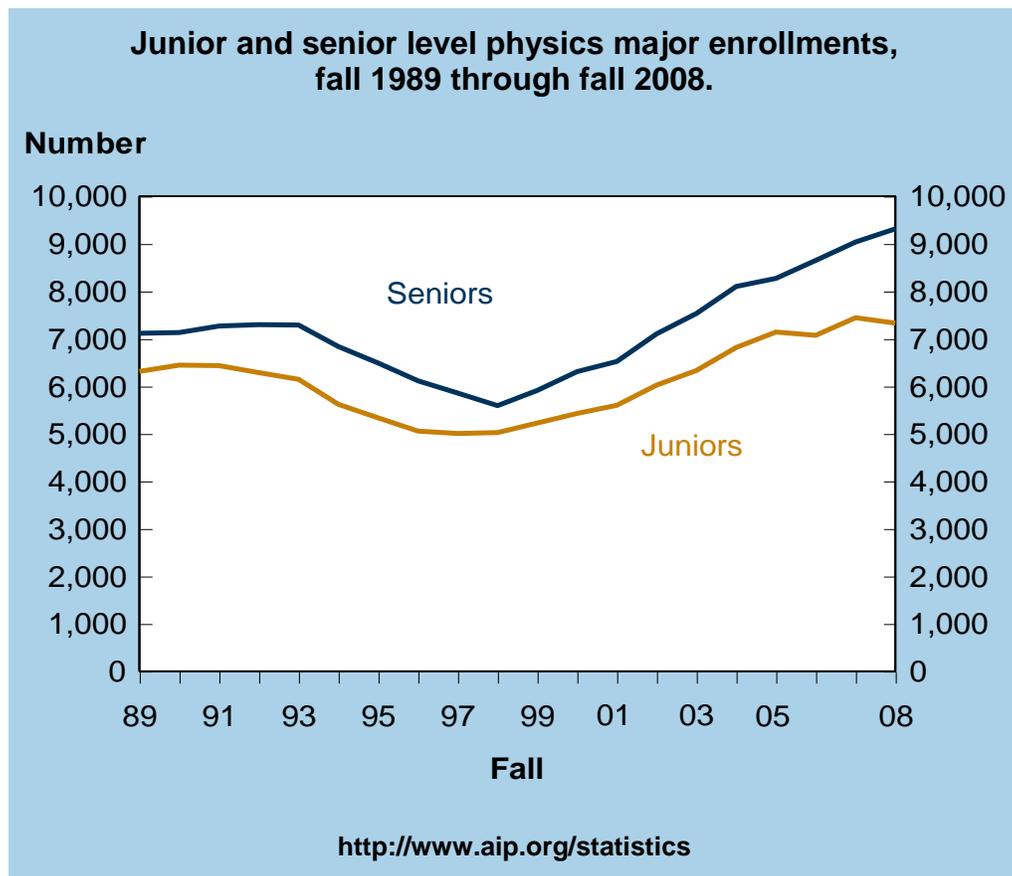
<http://www.aip.org/statistics>

Many physics departments also offer introductory-level astronomy and physical science courses.

Many physics departments (about 1/3) teach a physical science course with total enrollments of 56,000 students. About three-quarters of the physics departments offer an introductory astronomy course. These departments had a total introductory astronomy enrollment of 137,000 students during the 2007-2008 academic year. This is 3 times the enrollment seen at the 75 departments that offer astronomy degrees.

Approximately 3 out of 10 physics seniors maintain senior status for more than one year. Many factors contribute to why physics students might require more than four years to obtain their undergraduate degree, including: taking additional course work for a double major, changing major, taking a leave of absence, holding employment while enrolled part-time, and transferring from another institution.

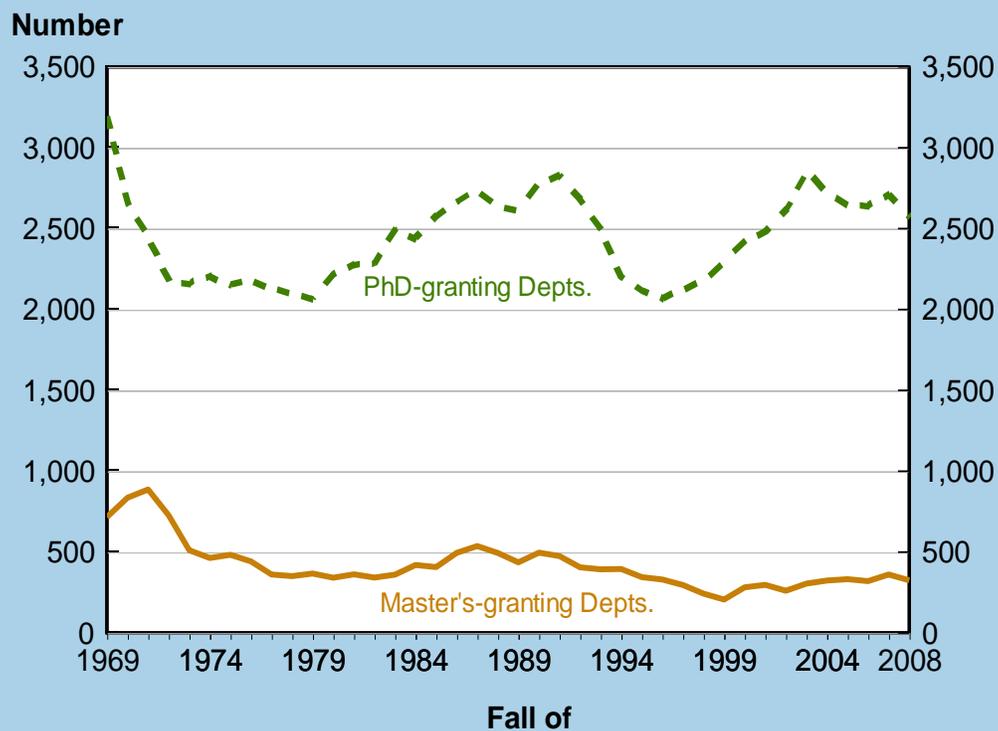
Figure 3



Undergraduate physics major enrollments have experienced substantial gains for over 10 years, with junior enrollments up 45% from a low in the late 1990's.

Figure 4

First-year graduate physics students in the US, fall 1969 through fall 2008.



First-year graduate student enrollments are up at master's-granting departments.

Note: Departments are separated by the highest physics degree that they offer.

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Students choosing to pursue graduate study in physics enroll in either a department that offers the master's as its highest physics degree or a department that offers a physics doctorate. The departments with doctoral programs on the whole are larger than their master's-granting counterparts averaging 14 and 5 first-year students a year respectively.

The number of first-year students enrolling in departments that offer a physics doctorate has declined by about 10% over the last 5 years after having experienced large increases from the fall of 1996 to fall 2003.

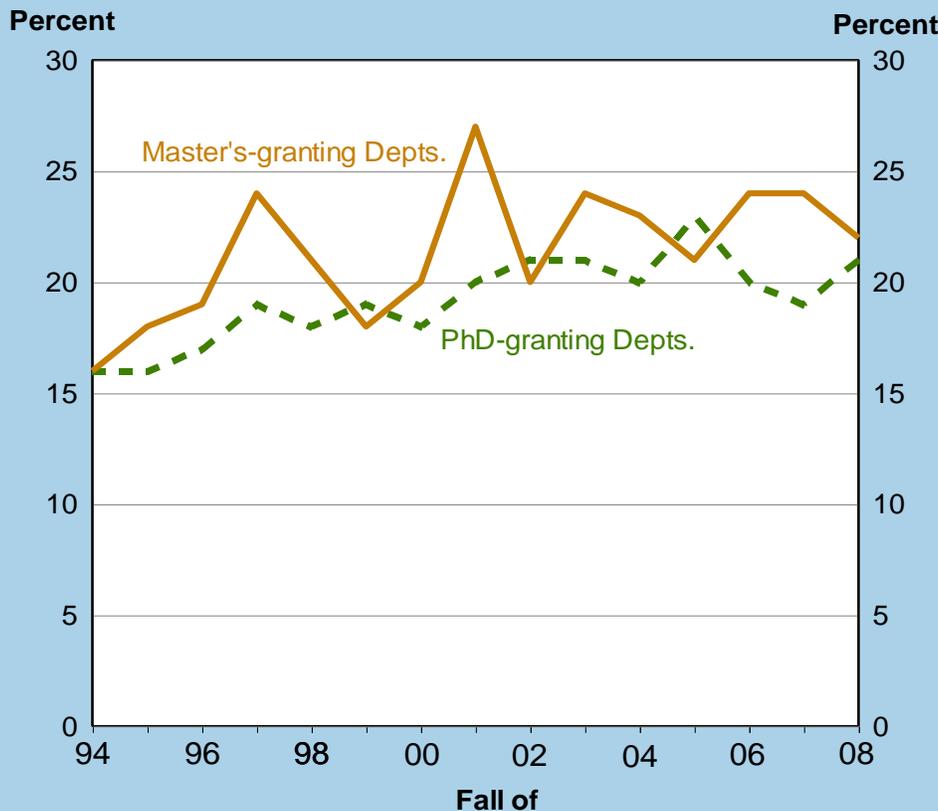
Although comparatively smaller in number, first-year student enrollments at master's-granting departments have been generally increasing (58%) since the fall of 1999. This increase has happened during a period when the number of departments with the master's as their highest degree has declined by 10%, from 70 to 63 departments.

Students exiting a physics department with a master's degree have 2 main post-degree options: enter the work force or enroll in another graduate program. As a result, about 5-7% of the first-year students enrolling in a PhD-granting physics department have a physics master's degree from another US physics department.

Graduate physics departments that offer a master's as their highest physics degree average a larger proportion of women enrolling as first-year students than do the departments that offer a doctorate in physics. Overall, the proportion of women enrolling as first-year graduate students has remained relatively unchanged in recent years.

Figure 5

Percent of women among first-year graduate physics students, fall 1994 through fall 2008.



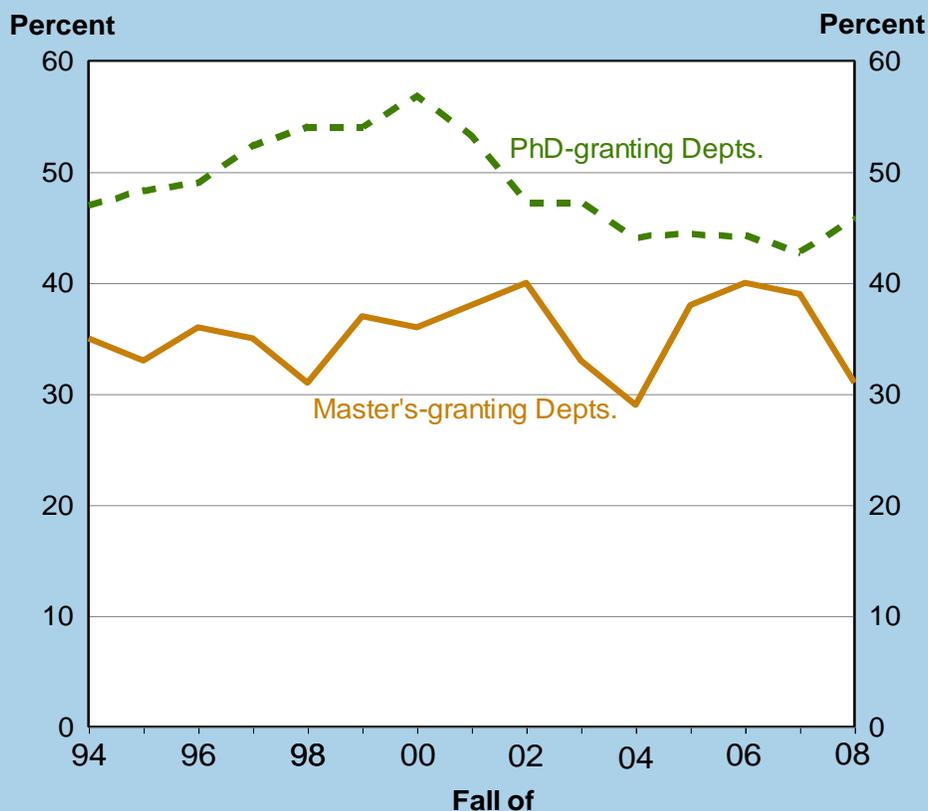
Note: Departments are separated by the highest physics degree that they offer.

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The proportion of women enrolling as first-year graduate students has remained relatively unchanged in recent years.

Figure 6

Percent of non-US citizens among first-year graduate physics students, fall 1994 through fall 2008.



Note: Departments are separated by the highest physics degree that they offer.

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

Among first-year students, the proportion of non-US citizens enrolling in doctoral-granting departments has declined from a high in the fall of 2000.

Non-US citizens comprise a larger proportion of the first-year student enrollments at doctoral-granting physics departments than they do at departments that offer a master's as their highest physics degree.

From the fall of 1997 to the fall of 2001, non-US citizens made up over half of the first-years students enrolling in US doctoral-granting physics departments. That proportion has declined to around 44% in recent years. This decline in the proportion of non-US students enrolling in doctoral-granting physics departments is a result of a steady increase in the number of US students enrolling while the number of non-US students has remained relatively flat in recent years.

The percentage of non-US citizens among first-year students enrolling in master's-granting departments has fluctuated between 30% and 40% for the last 2 decades. Upon receiving their master's, many of the non-US citizens, and to a lesser extent the US citizens, will enroll in a doctoral-granting physics department.

Appendix 1. Undergraduate physics student enrollments, fall 1999 – fall 2008.

| Fall of | Total | | Bachelor's-granting depts. | | Master's-granting depts. | | PhD-granting depts. | |
|---------|---------|---------|----------------------------|---------|--------------------------|---------|---------------------|---------|
| | Juniors | Seniors | Juniors | Seniors | Juniors | Seniors | Juniors | Seniors |
| 1999 | 5,227 | 5,913 | 2,348 | 2,271 | 465 | 589 | 2,414 | 3,053 |
| 2000 | 5,428 | 6,309 | 2,425 | 2,465 | 438 | 574 | 2,565 | 3,270 |
| 2001 | 5,599 | 6,521 | 2,472 | 2,528 | 443 | 594 | 2,684 | 3,399 |
| 2002 | 6,026 | 7,104 | 2,581 | 2,702 | 494 | 610 | 2,951 | 3,792 |
| 2003 | 6,333 | 7,532 | 2,727 | 2,759 | 548 | 694 | 3,058 | 4,079 |
| 2004 | 6,817 | 8,102 | 2,898 | 2,855 | 562 | 756 | 3,357 | 4,491 |
| 2005 | 7,141 | 8,272 | 3,014 | 3,090 | 575 | 745 | 3,552 | 4,437 |
| 2006 | 7,072 | 8,651 | 3,060 | 3,199 | 522 | 742 | 3,490 | 4,710 |
| 2007 | 7,444 | 9,037 | 3,143 | 3,370 | 536 | 730 | 3,765 | 4,937 |
| 2008 | 7,329 | 9,315 | 3,057 | 3,449 | 578 | 736 | 3,694 | 5,130 |

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

Appendix 2. Graduate physics student enrollments, fall 1999 – fall 2008.

| Fall of | Total | | Masters-granting depts. | | PhD-granting depts. | |
|---------|----------------------|------------|-------------------------|------------|----------------------|------------|
| | 1 st Year | Total Grad | 1 st Year | Total Grad | 1 st Year | Total Grad |
| 1999 | 2,510 | 10,768 | 206 | 664 | 2,304 | 10,104 |
| 2000 | 2,713 | 10,978 | 282 | 706 | 2,431 | 10,272 |
| 2001 | 2,777 | 11,402 | 297 | 780 | 2,480 | 10,622 |
| 2002 | 2,875 | 11,995 | 261 | 758 | 2,614 | 11,237 |
| 2003 | 3,168 | 12,141 | 305 | 800 | 2,863 | 12,141 |
| 2004 | 3,040 | 13,738 | 324 | 840 | 2,716 | 12,898 |
| 2005 | 2,984 | 13,889 | 332 | 912 | 2,652 | 12,977 |
| 2006 | 2,967 | 14,114 | 320 | 838 | 2,647 | 13,276 |
| 2007 | 3,069 | 14,326 | 361 | 930 | 2,708 | 13,396 |
| 2008 | 2,901 | 14,536 | 325 | 943 | 2,576 | 13,593 |

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

About the Survey

The Statistical Research Center of the American Institute of Physics conducts an annual census of all degree-granting physics departments in the United States and Puerto Rico. In the 2007-2008 academic year, there were 763 degree-granting departments. We received responses from 97% of these departments. Estimates were derived and included in the totals for non-responding departments.

This *focus on* series has a companion report, “Roster of Physics Departments”, which provides a departmental-level enrollment and degree snapshot of the class of 2008. It can be found on our web site: <http://www.aip.org/statistics/>

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.