

Astronomy Degree Recipients: Initial Employment

Data from the degree recipient follow-up survey for the classes of 2007, 2008 and 2009

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REPORTS ON INITIAL EMPLOYMENT

[Physics Bachelor's: Initial Employment \(June 2010\)](#)

[Physics & Astronomy Master's: Initial Employment \(April 2011\)](#)

[Physics Doctorate's: Initial Employment \(June 2011\)](#)

Astronomy Degree Recipients: Initial Employment (December 2011)

Astronomy bachelor's recipients employed in private sector STEM positions had a median starting salary of \$48,000.

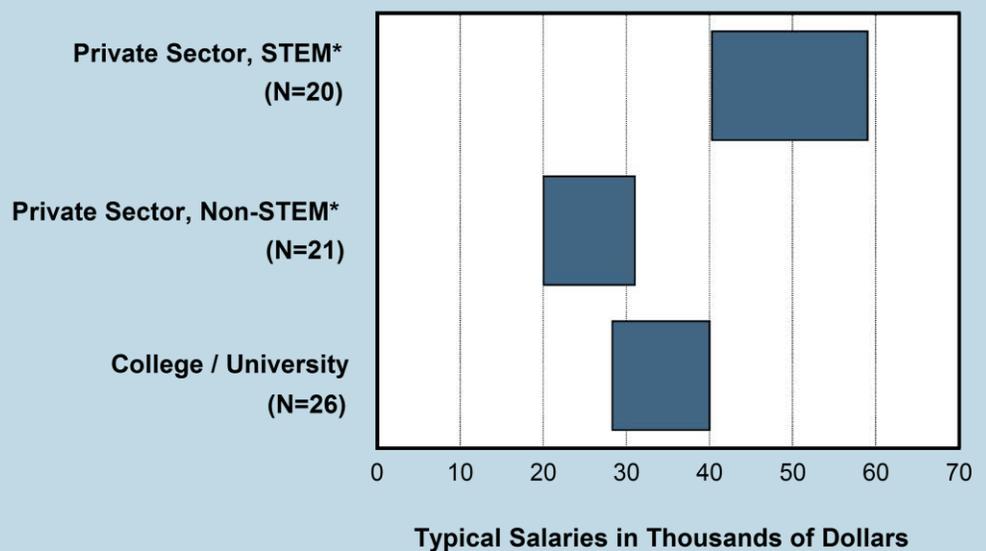
THE FOLLOW-UP SURVEYS OF BACHELOR'S, MASTER'S AND PHD RECIPIENTS

Degree recipients are contacted in the winter following the academic year in which they received their degree.

Within the private sector, astronomy bachelor's degree recipients employed in science, technology, engineering and math (STEM) had a median starting salary that was nearly \$25K higher than those employed in non-STEM positions. Virtually all astronomy bachelor's recipients employed in colleges and universities worked in STEM jobs and they too had higher starting salaries than their colleagues in the private sector working in non-STEM fields.

Figure 1

**Starting Salaries for Astronomy Bachelor's,
Classes of 2007, 2008 & 2009 Combined.**



Note: Typical salaries are the middle 50%, i.e., between the 25th and the 75th percentiles.

*STEM refers to positions in natural science, technology, engineering and math.

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

Table 1**Characteristics of Astronomy Bachelor's,
Classes of 2007, 2008 & 2009 Combined.**

Sex*	Male	61%
	Female	39%
Citizenship*	US	94%
	Non-US	6%
Age (N=224)	20-23	86%
	24+	14%
Highest Astronomy Degree of Department*	PhD	67%
	Master's	3%
	Bachelor's	30%
Double Major (N=234)	No	59%
	Yes	41%

*Source: Survey of Enrollments and Degrees

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

Forty-one percent of astronomy bachelor's recipients graduated with a double major.

There are 76 degree-granting astronomy departments in the U.S. These departments are evenly split, with 38 departments offering degrees in both astronomy and physics and 38 departments offering degrees in astronomy only.

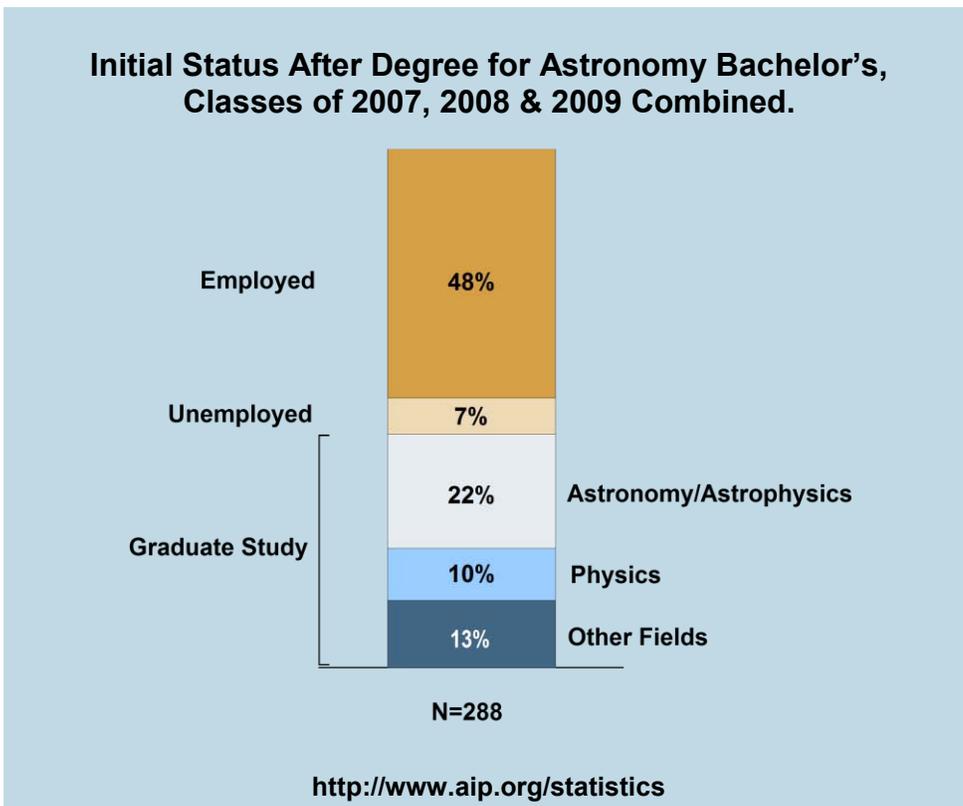
The number of astronomy bachelor's conferred each year is quite small. The classes of 2007 through 2009 averaged 328 astronomy bachelor's per year. Undergraduate astronomy degrees make up a very small part of the ~ 240,000 natural science and engineering degrees conferred in recent years.

A significant portion (41%) of astronomy bachelor's recipients graduated with a double major; this compares to 31% of physics bachelor's recipients. Physics was the most commonly reported second major for astronomy degree recipients, followed by math and engineering. Women represented 39% of astronomy bachelor's recipients.

Forty-eight percent of new astronomy bachelor’s degree recipients in the combined classes of 2007, 2008 and 2009 were employed in the winter following the year they received their degree. A significant fraction (45%) chose to immediately pursue graduate studies, about half of whom were enrolled in an astronomy or astrophysics program. Engineering topped the list of fields in the *Other Fields* category. Virtually all astronomy bachelor’s recipients continuing their education were enrolled in a graduate program in science or engineering.

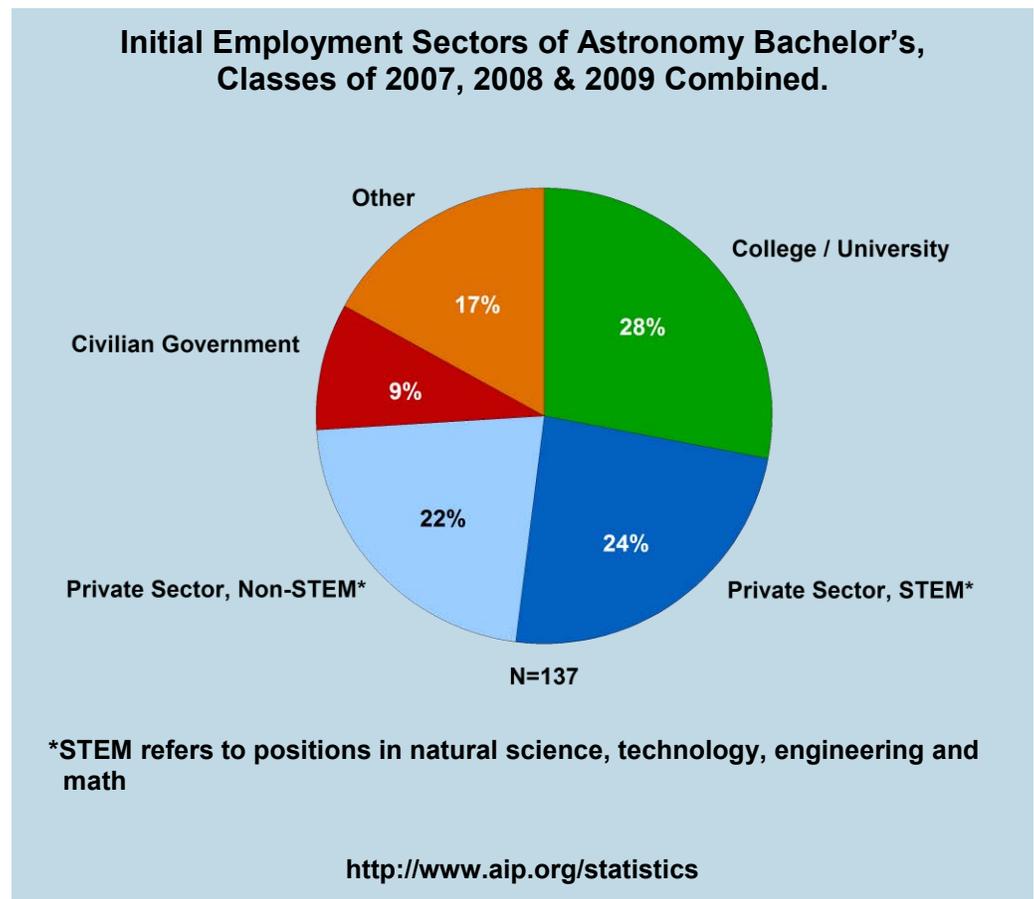
As a whole, more than half of the astronomy bachelor’s recipients of the combined classes of 2007, 2008 and 2009 reported receiving career guidance from faculty members. Bachelor’s recipients continuing on to graduate study were more likely (63%) to report having received career guidance from a faculty member than were recipients who directly entered the workforce (49%). Nearly half of the degree recipients that were in the workforce had plans to enroll in a graduate program in the future.

Figure 2



About half of new astronomy bachelor’s recipients enter the workforce after earning their degrees.

Figure 3



Half of all new astronomy bachelor's recipients employed in the private sector are working in a STEM field.

New astronomy bachelor's degree recipients found jobs throughout the economy but tended to be concentrated into three employment sectors: College/University, Private Sector in STEM fields and Private Sector in non-STEM fields. The *Other* designation is comprised primarily of high school and elementary school teaching and nonprofit organizations. Virtually all employed astronomy bachelor's recipients who were working outside of the private sector were working in a STEM field. Astronomy bachelor's recipients working in the private sector were more likely to be employed in a STEM field if they earned their bachelor's at a department that offered an astronomy PhD than if they earned their degree from a department where the bachelor's was the highest astronomy degree offered.

Three-quarters of all employed astronomy bachelor's recipients reported being satisfied with their current position. Satisfaction levels did vary depending on whether an individual worked in a STEM field or not. Just over half (52%) of astronomy bachelor's recipients employed in a non-STEM field were satisfied with their positions compared to 88% of those employed in STEM fields.

Profiles of the Prevailing Employment Sectors for Astronomy Bachelor's Degree Recipients

College and University – The majority of new astronomy bachelor's degree recipients working at colleges and universities were employed at the same institutions from which they received their bachelor's degrees. Many of these individuals were only intending to stay in their position for a short time with about half planning to continue their education at the graduate level within the next 2 years.

Almost all of those employed in colleges and universities reported working in a STEM field, with three-quarters reporting being employed in the fields of physics and astronomy. Most of the college and university positions had job titles such as research assistant or technician, while some were employed at a university observatory.

Private Sector – Almost half (46%) of employed astronomy bachelor's recipients in the combined classes of 2007, 2008 and 2009 were employed in the private sector. The types of employers varied and included large hi-tech companies, defense contractors and utilities as well as smaller retail and food service companies.

STEM – About half of astronomy bachelor's recipients employed in the private sector were employed in STEM fields. Many of these degree recipients were employed in the field of engineering, with some working for large government contractors while others were involved with manufacturing-related positions. Job titles frequently included the word *engineer*.

The next largest field employing astronomy bachelor's recipients was computer science or information technology. These employers could range from large software developers to the IT departments of smaller companies. These positions included titles such as *software associate*, *software developer* and *analyst*.

Non-STEM – Half of astronomy bachelor's recipients employed in the private sector indicated that their positions were not in STEM fields. These positions paid less than both the "Private Sector STEM" and the "College and University" positions. Some of these astronomy bachelor's recipients were employed as *associates* in retail or food service positions while others were working in the fields of finance and business.

Table 2**Characteristics of Exiting Astronomy Master's,*
Classes of 2007, 2008 & 2009 Combined.**

Sex**	Male	55%
	Female	45%
Citizenship**	US	92%
	Non-US	8%
Age (N=28)	Median	26
Highest Degree of Graduate Department**	PhD	69%
	Master's	31%

*Exiting master's are defined as individuals who left their departments with the master's as their highest degree.

**Source: AIP Survey of Enrollments and Degrees

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

Almost half of exiting astronomy master's degrees were earned by women.

For this report, exiting astronomy master's degree recipients are defined as individuals who received a master's degree in astronomy or astrophysics from a degree-granting US astronomy department and left that department with the master's as their highest degree. There are a total of 41 departments that offer graduate level degrees in astronomy and astrophysics. Three of these departments grant the master's as their highest degree with the remainder also offering a PhD.

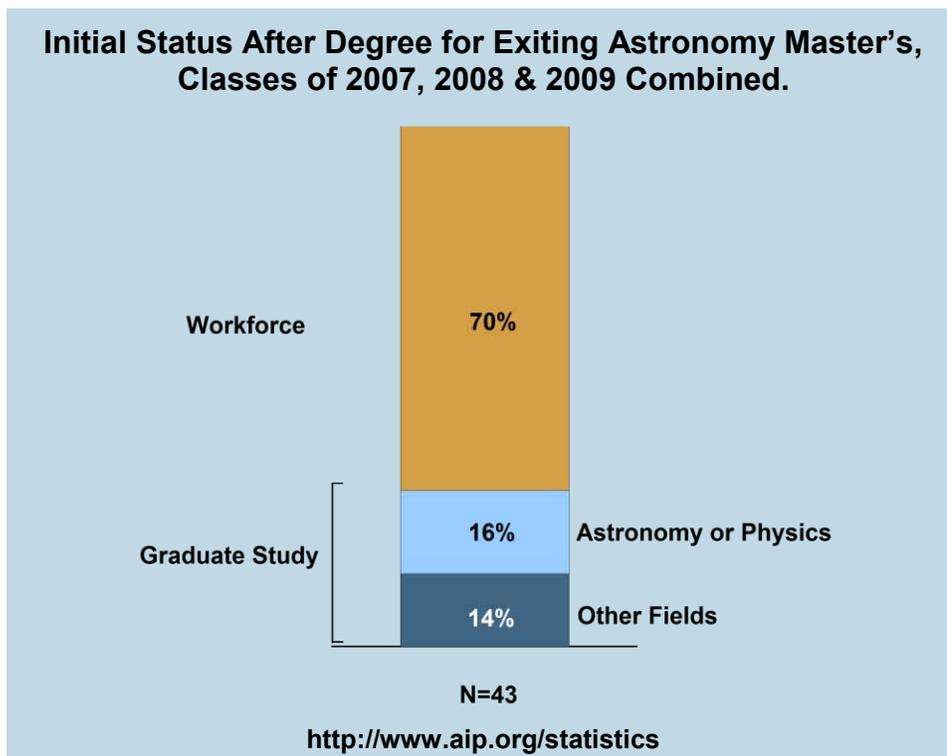
The data in this *focus on* are based on exiting astronomy master's recipients from the combined classes of 2007, 2008 & 2009. These classes averaged 28 exiting master's per year. We received responses from 50 individuals from these 3 classes. Almost one-third of the exiting astronomy master's recipients were produced by the three master's-granting departments.

Exiting astronomy master's degree recipients in the classes of 2007, 2008 and 2009 pursued a number of different career paths after receiving their degrees. A few of the respondents indicated they were no longer in the US and were not included in data presented here.

Thirty percent of exiting astronomy master's recipients chose to continue their education at another department or university, with approximately half of these pursuing their studies in astronomy, astrophysics, or physics.

Seventy percent of exiting astronomy master's recipients were in the workforce in the winter following the year they earned their degrees. Colleges and universities employed the largest number of astronomy master's recipients. This was followed by positions in the private sector and civilian government. Virtually all employed astronomy master's recipients were working in a STEM field.

Figure 4



Seventy percent of new astronomy master's recipients immediately entered the workforce.

Profiles of the Prevailing Employment Sectors for Exiting Astronomy Master's Degree Recipients

Academic - This employment sector consists of two-year colleges, four-year colleges, universities, university affiliated research institutes (UARIs), and observatories. Academic employment accounted for almost half of the positions that employed exiting astronomy master's recipients from the combined classes of 2007, 2008 and 2009. The majority of these positions involved physics or astronomy instruction, while others involved the operation of sophisticated equipment.

Private Sector - Over a quarter of the exiting astronomy master's recipients in the combined classes of 2007, 2008 and 2009 were employed in the private sector. Their employers varied from large research organizations to small startup companies.

Government - Astronomy master's recipients find employment in different branches of the civilian government such as the Office of Management and Budget and the National Security Agency. Astronomy master's recipients also work as civilians and officers in the military.

The classes of 2007, 2008 and 2009 averaged 140 PhDs from the 40 departments that offer doctorates in astronomy and astrophysics in the US. This total does not include physics PhD recipients with dissertation subfields of astronomy or astrophysics who received their PhDs from one of the 152 departments that offer only a physics PhD.

Table 3

**Characteristics of Astronomy PhDs,
Classes of 2007, 2008 & 2009 Combined.**

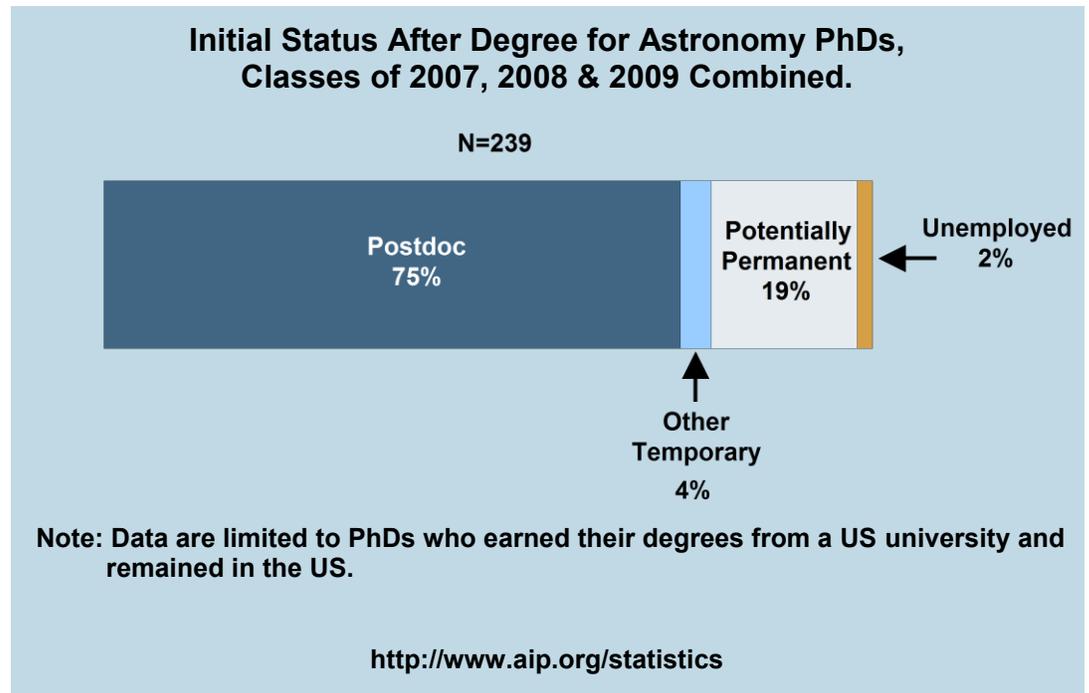
Sex*	Male	69%
	Female	31%
Citizenship*	US	71%
	Non-US	29%
Age (N=197)	Median	29

*Source: AIP Survey of Enrollments and Degrees

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

*U.S. citizens made up
71% of new astronomy
PhD recipients.*

Figure 5



Over three-quarters of new astronomy PhD recipients accepted postdoc positions.

About 17% of new astronomy PhD recipients from the combined classes of 2007, 2008 and 2009 left the US after receiving their degrees and are not included in the following discussion.

Three-quarters of new astronomy PhD recipients accepted a temporary postdoctoral appointment after receiving their degrees. A larger proportion of non-US citizens accepted a postdoc than US citizens, 88% and 71% respectively. About half of the postdocs reported that the initial duration of their postdoc was 3 years, with an additional third accepting 2 year appointments.

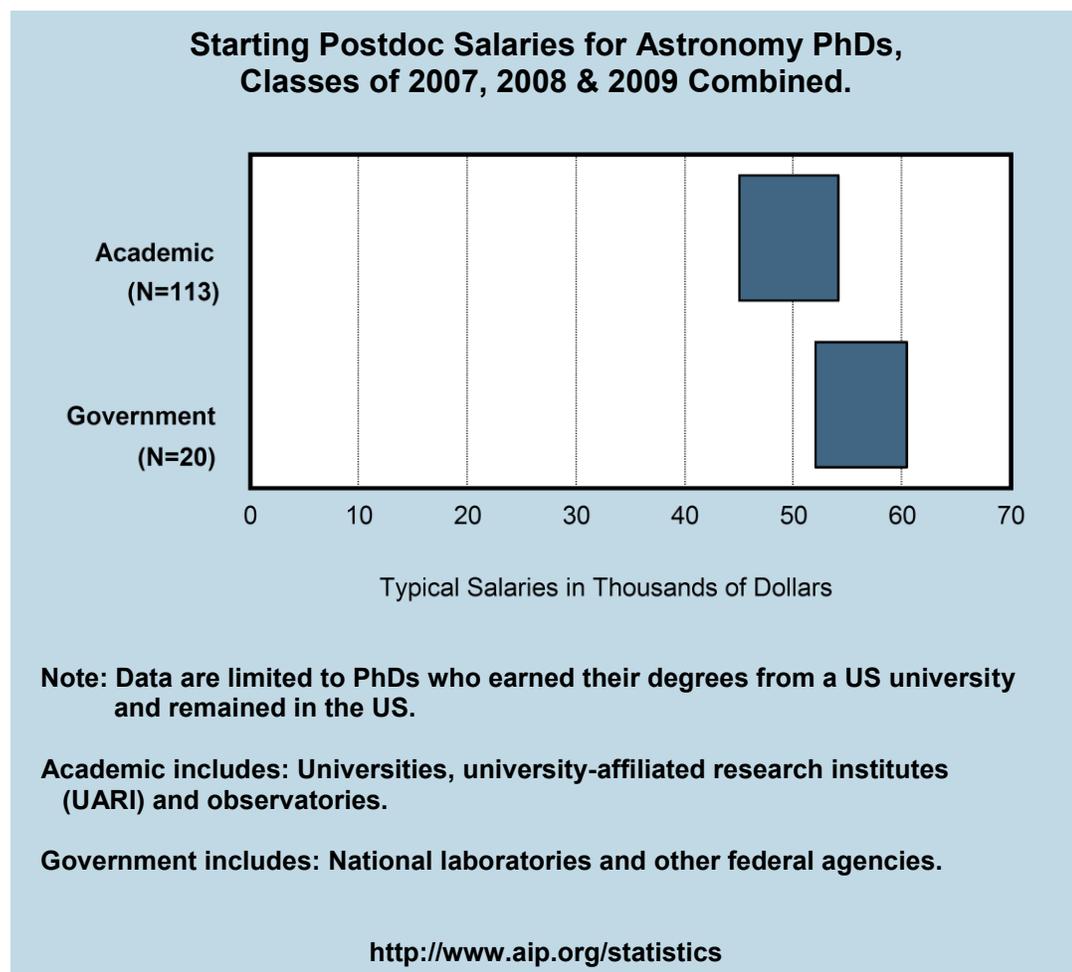
Half of the postdoc holders indicated that their primary reason for choosing to take a postdoc was that, "It was a necessary step toward a desired future position". Two other frequently cited reasons for taking a postdoc were: "To gain research experience in their field" and "To work with a particular scientist or research group". The majority (80%) of postdocs were working in academia and to a lesser extent, in civilian government positions.

New astronomy PhD recipients accepting potentially permanent positions were employed in the private sector, academia and to a lesser extent, in civilian government.

The salary range for new astronomy PhD recipients accepting postdocs with government agencies and at national labs was higher than the starting salaries of postdocs employed at universities and observatories.

The vast majority of employed astronomy PhD recipients indicated high levels of satisfaction concerning their employment. Across all sectors, new astronomy PhD recipients reported feeling “professionally challenged” and “satisfied” with their positions. They also considered their PhD “an appropriate background for the position they held” with very few reporting that they felt underemployed. In general, postdoc holders expressed greater satisfaction concerning their appointments than individuals with potentially permanent positions.

Figure 6



The median starting salary for astronomy PhDs in academia and government were \$50,000 & \$55,300 respectively.

Survey Methodology

Each fall the Statistical Research Center conducts its Survey of Enrollments and Degrees, which asks all degree-granting physics and astronomy departments in the US to provide information concerning the numbers of students they have enrolled and counts of recent degree recipients. In connection with this survey, we ask for the names and contact information for their recent degree recipients. This degree recipient information is used to conduct our Follow-up Survey in the winter following the academic year in which they received their degrees. The post-degree outcome data in this *focus on* come from that survey.

Recent degree recipients can be difficult to reach because they tend to relocate after receiving their degrees. The departments often do not provide or don't have accurate contact information for their alumni. To assist us in determining outcome information and to help obtain updated contact information, we contact the advisors of non-responding degree recipients. The information obtained from the advisors is limited to citizenship, sex, employment status, sector of employment, location (in or out of the US) and subfield of dissertation for the PhDs.

Because astronomy degree classes at all levels are relatively small, we have combined Follow-up Survey response data for three degree classes in order to reliably report on degree recipient outcomes. The Follow-up Surveys for astronomy degree recipients in the classes of 2007, 2008 and 2009 were administered primarily in a web-based format. Non-responding degree recipients were contacted up to four times with invitations to participate in the survey by both email and letter. Degree recipients who left the US after receiving their degree are not included in the employment analyses.

The astronomy bachelor's classes of 2007, 2008 and 2009 consisted of 336, 327 and 322 bachelors, respectively. We received post-degree information on 31% of these degree recipients. Twenty-three percent of the post-degree data came from advisors, with the remainder coming from the bachelor's themselves. Five percent of astronomy bachelor's recipients did not remain in the US after receiving their degree.

The exiting astronomy master's classes of 2007, 2008 and 2009 consisted of 18, 36 and 29 master's, respectively. We received post-degree information on 60% of these degree recipients. Forty-two percent of the post-degree data came from advisors, with the remainder coming from the master's themselves. Fourteen percent of astronomy master's recipients did not remain in the US after receiving their degree.

The astronomy PhD classes of 2007, 2008 and 2009 consisted of 125, 161 and 141 PhDs, respectively. We received post-degree information on 69% of these degree recipients. One-fifth of the post-degree data came from advisors and the remainder came from the PhD recipients themselves. Seventeen percent of astronomy PhD recipients did not remain in the US after receiving their degree.

In this *focus on*, "N" refers to the number of respondents about whom we had data on a particular item.

We thank the many astronomy departments, degree recipients and faculty advisors who have made this publication possible.