

Faculty Job Market in Physics and Astronomy Departments

Results from the 2018 Academic Workforce Survey

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In any academic department, faculty members retire or leave for a variety of reasons, and new faculty members are hired to replace departing faculty or fill newly created positions. This report focuses on departures, retirements, recruitments, and new hires in physics and astronomy departments. In our Academic Workforce Surveys, we collect the number of faculty departures in the *previous* academic year, the number of retirements for the *previous* and the *current* academic year, the number of new hires in the *current* academic year, and the number of recruitments for the *following* academic year. These are the most current data the departments can report. Thus, the numbers for departures, retirements, recruitments, and new hires reflect different academic years.

Departures from Physics Departments

Table 1 shows the total estimated number of physics faculty members departing their academic departments in the 2016–17 academic year, for any reason.

Table 1

Estimated Number of Faculty Departures in Physics Departments, 2016–17 Academic Year

	Highest Physics Degree Offered			
	PhD	Master's	Bachelor's	Overall
Number of Departures	202	31	138	371
Percent of Departures Among Faculty Members	3.4%	3.5%	3.8%	3.5%
Percent of Departments with Departures	61%	31%	25%	35%
Percent of Departing Faculty Members that Left Without Tenure	10%	15%	24%	16%
Total Headcount of Faculty Members	6,015	870	3,615	10,500

Note: The total headcount of faculty members is for the academic year of 2017–18. The total number of faculty members in this report differs from the total number reported in “The Number of Faculty Members in Physics Departments”, which reported full-time equivalent (FTE) faculty totals, not headcount totals.

It is not surprising that a greater percentage of PhD-granting physics departments had a departing faculty member. There were more faculty members at PhD-granting departments than departments where a bachelor's or master's was the highest physics degree offered. Yet, the percentage of departing faculty members across department types was quite similar. PhD-granting departments had 3.4% faculty departures, and departments that only offered physics bachelor's degrees had 3.8% faculty departures. It is worth noting that a larger proportion of faculty members departed without achieving tenure at bachelor's degree-only departments. Some may have been denied tenure, but others could have departed for other reasons. Faculty members might leave for a new job at a different academic institution, national lab, or industry organization, or faculty members might have transitioned to a non-tenured role at the same institution.

Retirements are a common type of departure from a department. **Table 2** shows the estimated number of retirements combined in two years, 2016–17 and 2017–18. We asked departments how many faculty members retired the previous academic year, and how many faculty members announced their retirement for the current academic year. PhD-granting departments were more likely to have faculty members retire, likely due to having more faculty members overall. However, as with departures, the percentage of retiring faculty members across department types was similar.

Table 2

**Estimated Number of Retirements for Faculty in Physics Departments,
2016–17 and 2017–18 Academic Years**

	Highest Physics Degree Offered			
	PhD	Master's	Bachelor's	Overall
Number of Retirements (2016–17 and 2017–18 Combined)	228	27	130	385
Percent of Retirements Among All Faculty Members (Averaged Across 2016–17 and 2017–18)	1.9%	1.5%	1.8%	1.8%
Percent of Departments with a Retirement	60%	40%	21%	32%
Total Headcount of Faculty Members	6,015	870	3,615	10,500

Note: The percent of retirements is based on the average number of retirements over the two academic years divided by the total number of faculty members in 2017–18, as shown on the last row.

Recruitment and New Hires in Physics Departments

Departments were asked how many new faculty positions they recruited or planned to recruit for the 2018–19 academic year. It is important to note that not all planned recruitments would be filled in 2018–19. Positions may be filled in later years, searches may result in no candidates, or administrative decisions outside of the department may cause a position to be closed. **Table 3** shows the number of recruitments by position type. In total, there were 570 faculty member recruitments for 2018–19, and 45% of physics departments were recruiting for full-time positions. The largest proportion of recruitments was at PhD-granting departments, with 66% of departments recruiting.

Table 3

Estimated Number of Recruitments for Physics Departments, 2018–19 Academic Year				
	Highest Physics Degree Offered			
	PhD	Master's	Bachelor's	Overall
Percent of Departments Recruiting	66%	51%	37%	45%
Number of Tenure/Tenure-Track Faculty Recruitments	215	31	123	369
Number of Temporary Full-Time Faculty Recruitments	27	8	102	137
Number of Non-Tenure-Track, Permanent Recruitments	34	6	25	65


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Table 4 shows the estimated number of new hires and the percent of departments that reported hiring at least one new faculty member during the 2017–2018 academic year. Most new hires at physics departments were men (72%). Departments that only offered bachelor’s degrees hired a greater percentage of women (32%) compared to their PhD-granting counterparts (25%). Interestingly, women represent a higher proportion of new faculty hires in physics departments than among US physics PhD recipients. New hires were more likely to have received their PhD within the previous five years, and women represented, on average, about 19% of the PhDs awarded at US physics departments in the classes of 2014–18.

Table 4

Estimated Number of New Hires and Percent of Physics Departments That Hired a Faculty Member, 2017–18 Academic Year

	Highest Physics Degree Offered			
	PhD	Master's	Bachelor's	Overall
Number of New Hires	225	46	285	556
Percent of Departments with a New Hire	66%	41%	40%	47%
Percent of Women Among New Hires	25%	20%	32%	28%

Figure 1 shows the positions of the new faculty hires broken down by the highest degree offered in departments. PhD-granting departments hired a noticeably larger proportion of tenure-track faculty members than their counterparts; 69% of new faculty members at PhD-granting departments were tenure track. Departments where a master’s was the highest degree offered hired the greatest proportion of part-time and other faculty members, whereas departments that only offered bachelor’s degrees hired the greatest proportion of temporary full-time faculty members.

Figure 1

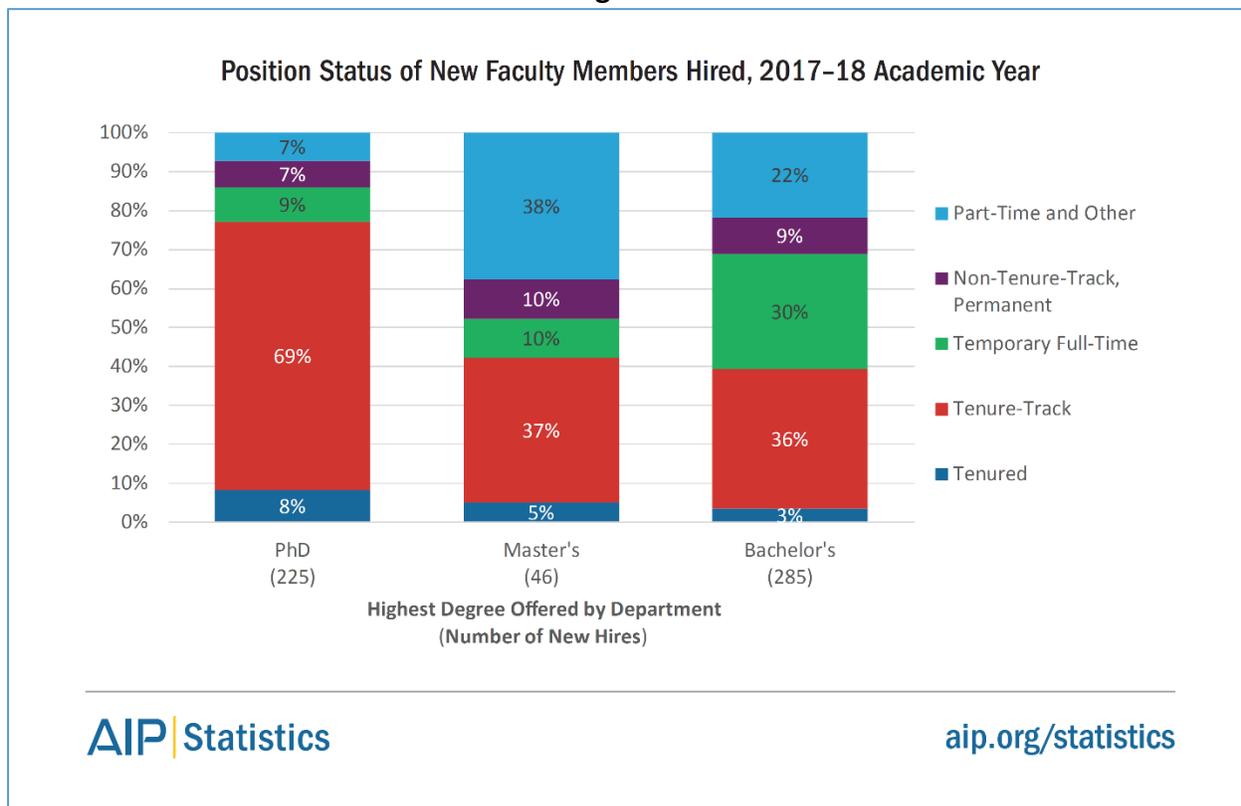


Table 5 and **Table 6** detail the previous position title and employment background of newly hired tenured or tenure-track physics faculty members. We compared the employment backgrounds of new hires at PhD-granting departments and departments that only offer bachelor’s degrees. Tenured and tenure-track faculty members hired by PhD-granting departments were more likely to have worked as a postdoc or research scientist before their new position. New tenured or tenure-track hires at departments that only offered bachelor’s degrees were more likely to have worked as a graduate student, instructor, adjunct, visiting faculty, part-time faculty, or other before their new position. Other previous positions included working as a high school teacher or being a retired faculty member, suggesting they came out of retirement or worked in an emeritus position.

Table 5

**Previous Position Title of New Tenured or Tenure-Track Physics Faculty Members Hired,
2017-18 Academic Year**

	Highest Physics Degree Offered	
	PhD	Bachelor's
Graduate Student	1%	12%
Postdoc	61%	41%
Tenured or Tenure-Track Professor	19%	18%
Research Scientist	17%	5%
Instructor, Adjunct, Part-Time, Visiting, or Other	2%	24%

Note: These data are not provided for Master's departments due to the small number of new hires in those departments.

At least half of all new faculty members earned a PhD within the last five years, and this was more common at departments that only offered bachelor's degrees. New hires at PhD-granting departments were more likely to have earned a PhD outside the US.

Table 6

**Academic Background of New Tenured and Tenure-Track Faculty Members,
2017-18 Academic Year**

	Highest Physics Degree Offered	
	PhD	Bachelor's
Earned PhD in the US within the last 5 years	41%	61%
Earned PhD outside the US	20%	7%
Earned PhD in the US more than 5 years ago; previously employed in academia in the US	33%	25%
Earned PhD in the US more than 5 years ago; previously employed outside academia	6%	7%

Note: These data are not provided for Master's departments due to the small number of new hires in those departments.

Departures, Retirements, and Recruitments in Astronomy Departments

There were 39 stand-alone astronomy departments that granted astronomy degrees (and no physics degrees) in the 2017–18 academic year. **Table 7** below details the estimated number of departures, retirements, and recruitments of these departments. Of the 39 astronomy departments, 31 were PhD-granting. Therefore, we did not compare numbers for departments that offered a bachelor’s or master’s as their highest degree. Out of the 37 newly hired astronomy faculty members for the 2017–18 academic year, 49% of these new hires were women. As with physics, women represented a higher proportion of new faculty hires in astronomy departments than among US astronomy PhD recipients. Women earned about 36% of the PhDs awarded at US astronomy departments in the classes of 2014–18.

Table 7

Estimated Number of Departures, Retirements, and Recruitments in Astronomy Departments, 2016–17 to 2018–19 Academic Years

	Number of Faculty	Percentage of Departments That Reported Faculty...
Departures (2016-17)	24	43%
Retirements (2016-17 and 2017-18 combined)	25	35%
Recruitments (2018-19)	54	57%
New Hires (2017-18)	37	43%

Methodology

This Focus On series uses data from the 2018 Academic Workforce Survey. The Academic Workforce Survey has been conducted every two years since 1986. Between March and June 2018, we contacted 797 physics and astronomy departments (including 39 astronomy-only departments) that award a bachelor's degree in physics or astronomy. We sent follow-up requests to those departments that had not responded. We received responses from 720 institutions, a 90% response rate. For nonresponding departments, we used sample weights to estimate the number of departures, retirements, recruitments, and new hires.

Acknowledgments

We offer our sincere gratitude to the responding departments. Without your help, we could not track these data or provide them to the community.

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