

Report on 2016–2017 Academic Recruitment, Hiring, and Attrition

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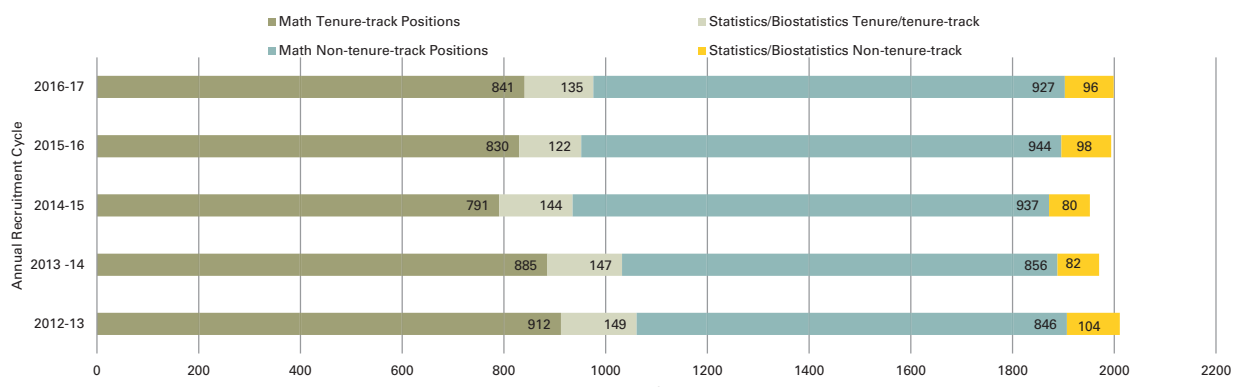
Each year in academic mathematical sciences departments around the United States, new full-time faculty are recruited, and a subset of those positions are filled. The hiring infuses a new cohort of mathematical scientists actively engaged in research and teaching. At the same time, others retire, take jobs elsewhere, or die, and this process removes a segment of the population of mathematical scientists. This report provides a snapshot of that process to aid in understanding the current status of such variables as: hiring rates, gender distribution, position type, and prior experience. Along with current data the report provides historical context to aid the reader in discerning trends and patterns. For further details, including all tables generated to prepare this report, please see www.ams.org/annual-survey.

A total of 955 mathematical sciences departments participated in this survey. This report is based on the completed questionnaires received from the 500 departments that reported recruiting to fill doctoral tenure-track and non-tenure-track positions during the academic year 2016-2017 for employment beginning in the fall of 2017. An additional 7 departments (2 Stats, 2 Masters, and 3 Bachelors) reported conducting recruitment and hiring during this time but did not return a completed questionnaire. Those departments are not included in the analysis.

Overview of Recruitment

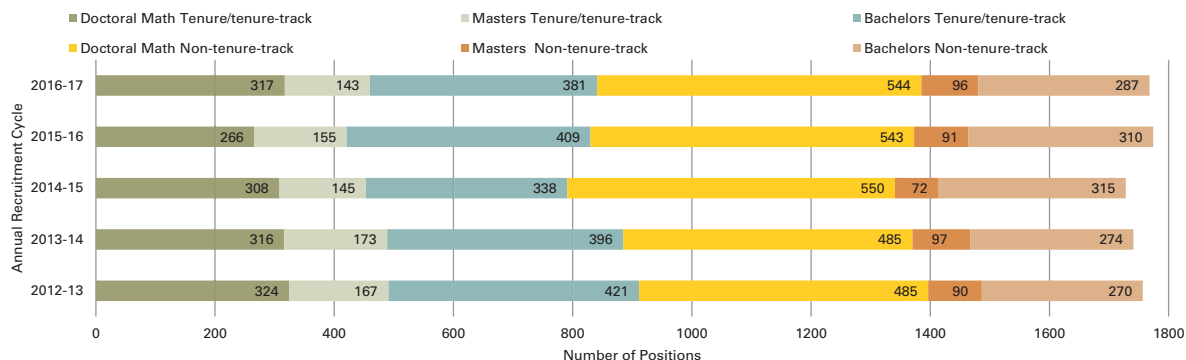
The 2016-17 data shows that 1,999 positions were under recruitment (in 2015-16 this figure was 1,994). Most groups reported increases in recruitment, though Math Private Large ($\downarrow 25\%$), Applied Math ($\downarrow 15\%$), and Masters and Bachelors ($\downarrow 6\%$), reported decreases.

Figure R.1: Positions Under Recruitment in Mathematical Sciences by Tenure Eligibility



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Figure R.2: Positions Under Recruitment in Mathematics Departments by Highest Mathematical Sciences Degree Offered



During the 2016–17 academic year, the estimated number of full-time positions under recruitment in mathematical sciences departments was 1,999. This figure breaks down as follows: 841 tenure-track mathematics positions, 927 non-tenure-track mathematics positions, 135 tenure-track statistics or biostatistics positions, and 96 non-tenure-track statistics or biostatistics positions. See Figure R.1 for comparisons. In the period from 2012 to 2017, the overall percentage of positions under recruitment that were tenure-track ranged from 48% to 53%, with the highest percentages in 2012–2013 and 2013–2014 of this range of time.

- Overall features in the 2016–2017 cycle:
 - The estimated number of positions under recruitment was 1,999; this figure represents a slight increase from last year’s estimate of 1,994 positions.
 - Women account for 31% of those hired; down from 32% in 2015–16.
 - Since 2010 recruitment has increased 65% in all Mathematical Sciences, increased 63% in Math, and increased 75% in Stats.
- Tenure-track positions under recruitment:
 - Open tenure-track positions increased 3% overall from 2015–16.
 - 49% (976) of all positions under recruitment were tenure-track. Of these 976 positions, 85% (831) were open to new PhDs, and 21% (201) were at the rank of associate/full professor.
- Non-tenure-track positions under recruitment:
 - Non-tenure-track positions decreased 2% overall, to 1,023 from 1,042 the previous year.
 - 51% (1,023) of all positions under recruitment were non-tenure-track.

In Math the number of positions under recruitment (1,768) in 2016–2017 is comparable with the previous year (1,774). See Figure R.2. Over the period since 2006–07 recruitment in Doctoral departments has increased by 13%, in Masters departments decreased by 14%, and in Bachelors departments decreased by 10%. In the same ten-year period, the net number of mathematics positions under recruitment has decreased by 1%.

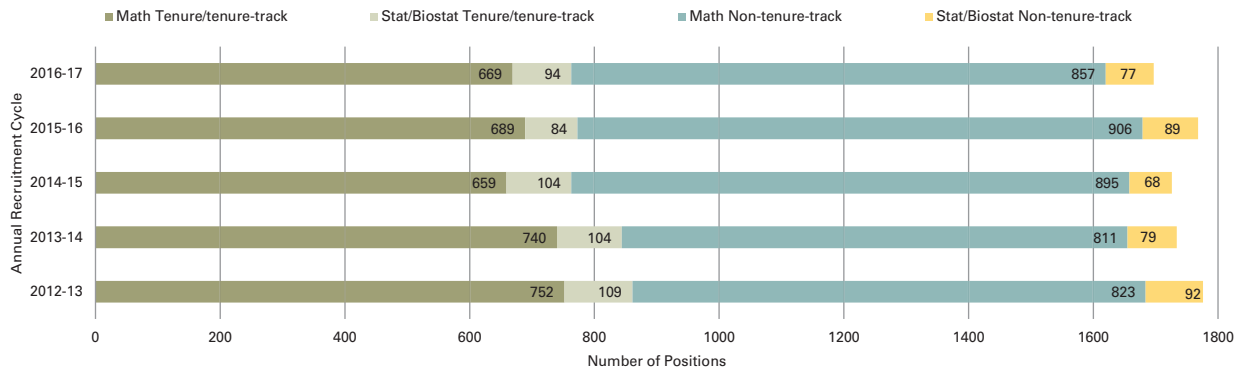
In Stats, the number of positions under recruitment in 2016–2017 was 231 a 5% increase over 2015–16. Since 2012–13 positions under recruitment has fluctuated between 220 and 253.

Positions Filled

A total of 1,697 full-time positions in Mathematical Sciences were filled during the 2016–17 academic cycle, 1,526 from Mathematics Departments and 171 from Statistics or Biostatistics. Figure F.1 gives a breakdown. The total for Math is up 59% from the 2009–10 cycle. For Stats, the number of filled positions is up 30% from 2009–10. One interesting feature implicit in these data is that the success rate for filling mathematical sciences tenure-track positions over the period 2012–17 is about 81%, whereas the success rate for non-tenure-track is about 95%.

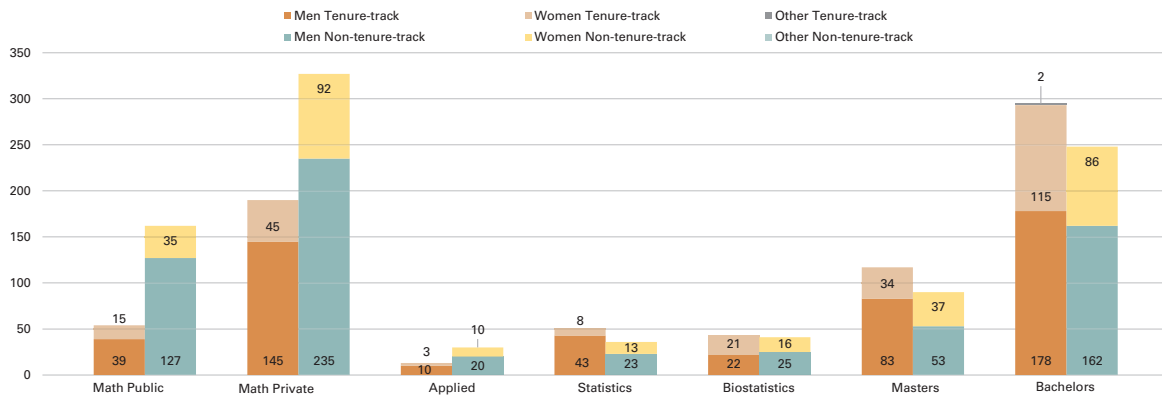
Figure F.2 gives a breakdown on hiring by gender and department grouping. Percentages generally are obtained by comparison with Figure R.1. Here are further highlights and comparisons from the data:

Figure F.1: Positions Filled in Mathematical Sciences



- Overall features of hires in mathematical sciences:
 - Women hold 31% (530) of positions filled.
 - Of all hires, 45% (763) were tenure-track; women constitute 32% (241) of these.
 - Of all hires, 55% (934) were non-tenure track; women constitute 31% (289) of these.
- Math and Stats breakdown:
 - In Math overall, 1,526 of 1,768 positions (86%) were filled; 31% of Math positions were filled by women.
 - In Stats, 171 of 231 positions (74%) were filled; 34% of Stats positions were filled by women.
- Tenure-track hires in mathematical sciences:
 - Of the tenure-track positions under recruitment, 78% (763) were filled.
 - Of tenure-track positions filled, 70% (531) were filled by doctoral faculty (i.e., not new PhDs). Of these positions filled by doctoral faculty, 27% went to women. In comparison with last year, all groups reported increases in tenure-track hires of doctoral faculty except Applied Math (↓24%), Statistics (↓4%), Masters (↓9%), and Bachelors (↓13%).
 - Of the 30% of tenure-track hires who were new PhDs, 43% were women.
 - Of tenure-track hires, 15% (114) had a non-tenure-track position last year; of these individuals, 23% were women.
 - Of tenure-track hires, 35% (267) held a postdoc last year, and 25% of these postdocs were women.
- Non-tenure-track hires
 - Of the 1,023 non-tenure-track positions under recruitment, 91% were filled. In comparison to last year, all groups reported decreased hiring of non-tenure-track faculty except Math Public Small (↑26%), Math Private Large (↑9%), and Masters (↑22%).
 - Of non-tenure-track hires, 39% (360) were filled by doctoral faculty (excluding new PhDs); 29% of these doctoral faculty hires were women.
 - Of non-tenure-track hires, 49% (461) were filled by new PhDs; 25% of these new PhD hires were women.

Figure F.2: Gender of Tenure-track and Non-tenure-track Hires by Department Grouping



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- Non-tenure-track hires (continued)
 - Of non-tenure-track hires, 12% (113) were filled by non-doctoral faculty; 61% of these non-doctoral hires were women. Forty-two percent of these non-doctoral, non-tenure-track hires were in Masters departments.
 - Of non-tenure-track hires, 24% (224) are temporary (one-year); 32% of these temporary hires are women. About half of all temporary hires were in Bachelors departments.
 - Of non-tenure-track hires, 41% (382) were in postdoctoral positions; 23% of these postdocs were women.
- Women hires (see Figure F.2):
 - Of all hires, 31% (530) were women; of these women, Bachelors departments hired 38%, and Doctoral Math departments hired 38%.
 - In the Doctoral Math Group, women hires increased by 6% to 200.
 - All groups reported increases in the number of women hires over last year except Math Private Small (↓40%), Applied Math (↓30%), Statistics (↓34%), and Bachelors (↓14%) .
 - The number of women hired into tenure-track positions increased slightly to 241 from 238; the number hired into non-tenure-track positions increased by 12% to 289.
 - Women accounted for 32% of all tenure-track and 31% of all non-tenure track hires; in 2015–2016 these percentages were, respectively, 31% and 26%.

Faculty Attrition

Figure A.1 shows the variation in attrition from deaths and retirements among full-time faculty for the academic years 2012–13 through 2016–17. On average over the period shown, the percentage of faculty in doctoral departments retiring or dying each year is about 1.9%, and in Masters and Bachelors departments that percentage is about 2.7%.

Figure A.1: Percentage Full-time Faculty Died/Retired*

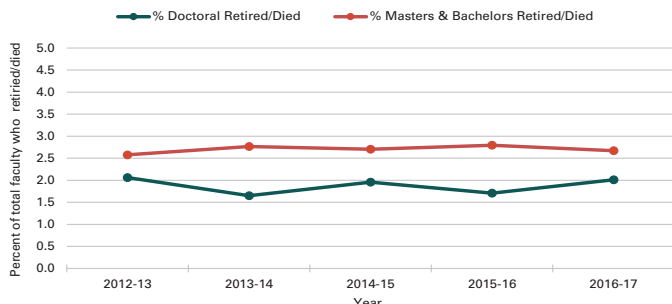
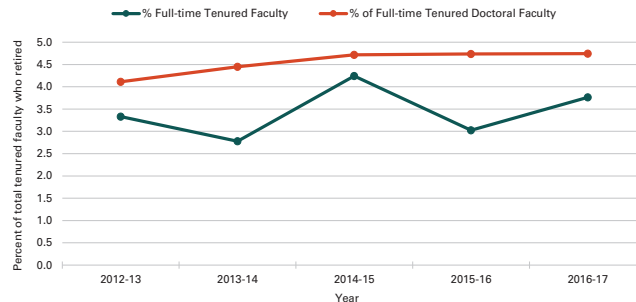


Figure A.2: Percentage Full-time Tenured Doctoral Faculty Died/Retired*



* The percentage of full-time faculty who died or retired is the number of faculty who died or retired at some point during the academic year (September 1 through August 31) divided by the number of full-time faculty at the start of the academic year.

During the same period, in the respective groups, the percentages of tenured faculty who retired averaged 3.3% for Doctoral Math departments, 4.7% for Bachelors and Masters, and 5.8% for Stats. As reported in previous years, departments continue to report the majority of those retiring as members of the tenured faculty. For instance, for 2015–2017 approximately, 82%, 83%, and 82% of these faculty have retired.

Here are a few other highlights from the attrition data from the 2016–2017 cycle:

- Overall retirements by tenured faculty increased by 9% to 469
- Deaths and retirements increased by 6% to 599
- Overall deaths and retirements break down by departmental grouping as follows:
 - 44% (263) were from Bachelor
 - 29% (175) were from Doctoral Math
 - 16% (97) were from Masters
 - 11% (64) were from Stats

Department Grouping Response Rates

In this report, *Mathematical Sciences* departments are those in four-year institutions in the US that refer to themselves with a name that incorporates (with a few exceptions) “Mathematics” or “Statistics” in some form. For instance, the term includes, but is not limited to, departments of “Mathematics,” “Mathematical Sciences,” “Mathematics and Statistics,” “Mathematics and Computer Science,” “Applied Mathematics,” “Statistics,” and “Biostatistics.” Also, *Mathematics (Math)* refers to departments that (with exceptions) have “mathematics” in the name; *Stats* refers to departments that incorporate (again, with exceptions) “statistics” or “biostatistics” in the name but do not use “mathematics.” The streamlining of language here militates against the possible objection to foreshortening the full subject names.

Math Public Large consists of departments with the highest annual rate of production of PhDs, ranging between 7.0 and 24.2 per year.

Math Public Medium consists of departments with an annual rate of production of PhDs, ranging between 3.9 and 6.9 per year.

Math Public Small consists of departments with an annual rate of production of PhDs of 3.8 or less per year.

Math Private Large consists of departments with an annual rate of production of PhDs, ranging between 3.9 and 19.8 per year.

Math Private Small consists of departments with an annual rate of production of PhDs of 3.8 or less per year.

Applied Math consists of doctoral-degree-granting applied mathematics departments.

Statistics consists of doctoral-degree-granting statistics departments.

Biostatistics consists of doctoral-degree-granting biostatistics departments.

Masters contains US departments granting a master's degree as the highest graduate degree.

Bachelors contains US departments granting a baccalaureate degree only.

Doctoral Math contains all US math public, math private, and applied math mathematics departments granting a PhD as the highest graduate degree.

Mathematics (Math) contains all Math Public, Math Private, Applied Math, Masters, and Bachelors Groups above.

Stats consists of all doctoral-degree-granting statistics and biostatistics departments.

Listings of the actual departments that compose these groups are available on the AMS website at www.ams.org/annual-survey/groups.

Response Rates by Survey Groups

Faculty Recruitment & Hiring Response Rates*

Group	Received (%)
Math Public Large	24 of 26 with 23 recruiting (92%)
Math Public Medium	36 of 40 with 35 recruiting (90%)
Math Public Small	61 of 68 with 43 recruiting (90%)
Math Private Large	21 of 24 with 19 recruiting (88%)
Math Private Small	23 of 28 with 17 recruiting (82%)
Applied Math	18 of 23 with 14 recruiting (78%)
Statistics	45 of 59 with 32 recruiting (76%)
Biostatistics	34 of 45 with 24 recruiting (76%)
Masters	119 of 174 with 65 recruiting (68%)
Bachelors	574 of 1020 with 228 recruiting (56%)
Total	955 of 1507 with 500 recruiting (63%)

* Doctoral programs that do not formally “house” faculty and their salaries are excluded from this survey.

Other Information

The interested reader may view additional details on the results of this survey and prior year trends by visiting the AMS website at www.ams.org/annual-survey.

Acknowledgments

The Annual Survey attempts to provide an accurate appraisal and analysis of various aspects of the academic mathematical sciences scene for the use and benefit of the community and for filling the information needs of the professional organizations. Every year, college and university departments in the United States are invited to respond. The Annual Survey relies heavily on the conscientious efforts of the dedicated staff members of these departments for the quality of its information. On behalf of the Joint Data Committee and the Annual Survey Staff, we thank the many secretarial and administrative staff members in the mathematical sciences departments for their cooperation and assistance in responding to the survey questionnaires. Comments or suggestions regarding this Survey Report may be emailed to the committee at ams-survey@ams.org.