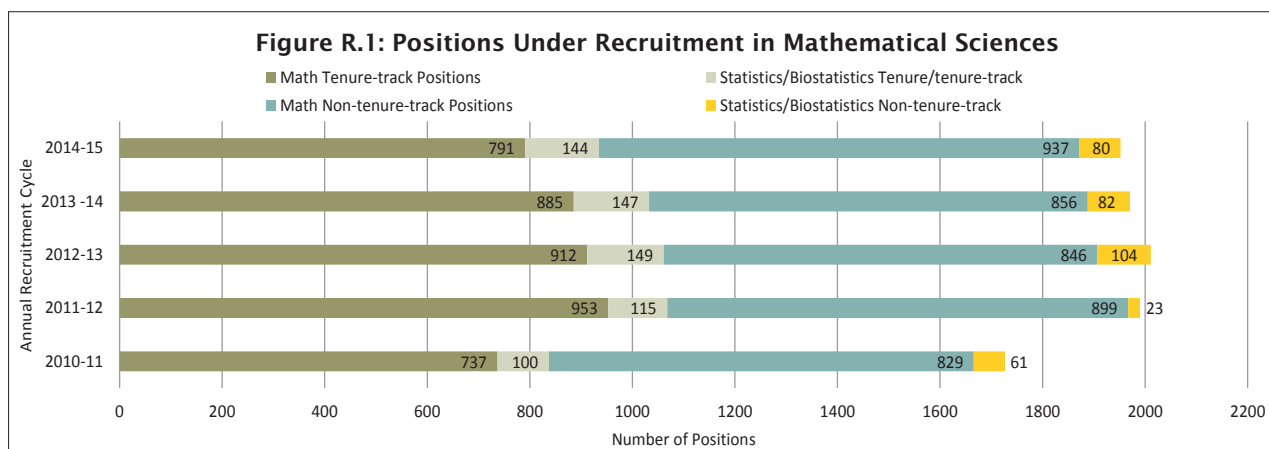


Report on 2014–2015 Academic Recruitment, Hiring, and Attrition

William Yslas Vélez, Thomas H. Barr, and Colleen A. Rose

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, resign, 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.

During the 2014–15 academic year, the estimated number of full-time positions under recruitment in mathematical sciences departments was 1,952. This figure breaks down as follows: 791 tenure-track mathematics positions, 937 non-tenure-track mathematics positions, 144 tenure-track statistics or biostatistics positions, and 80 non-tenure-track statistics or biostatistics positions. See Figure R.1 for comparisons. For the cycles 2011–2012 through 2013–2014, recruitment was up in comparison with the preceding three years, likely a reflection of economic conditions during that time. In the period from 2008 to 2015, the overall percentage of positions under recruitment that were tenure-track ranged from 48% to 63%, with the highest percentages in the first two years of this range of time.¹

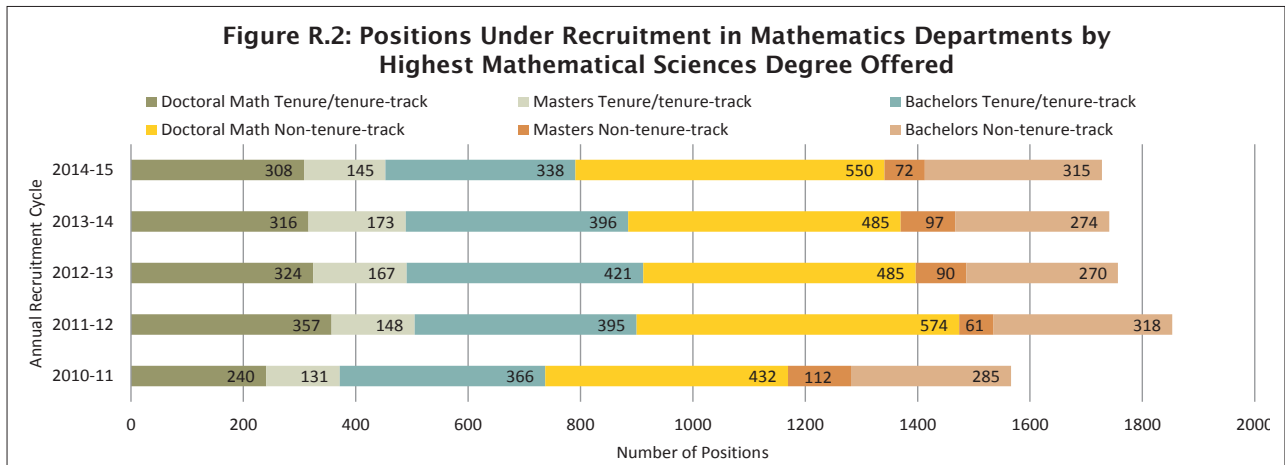


- Overall features in the 2014–2015 cycle:
 - The estimated number of positions under recruitment was 1,952; this figure represents a slight decrease from last year's estimate of 1,970 positions; 88% (1,726) of these positions were filled.
 - Females account for 29% of those hired; this is up from 23% in the previous year.
 - Since 2007 recruitment has increased 61% in all Mathematical Sciences, increasing 60% in Mathematics and 70% in Statistics.
- Tenure-track positions under recruitment:
 - Open tenure-track positions dropped 9% overall from last year, with all groups reporting decreases except Math Private Small and Statistics, which reported increases of 77% and 3%, respectively.
 - 48% (935) of all positions under recruitment were tenure-track. Of these 935 positions:
 - 85% (793) were open to new PhDs; this is down 10% from the previous year. Only the Math Private, Statistics, and Biostatistics groups reported increases in the number positions open to new PhDs.
 - 23% (213) were at the rank of associate/full professor, down 9% from the previous year. All groups reported increases in recruitment in this category except Math Public Small, Math Private Large, and Bachelor's.

¹Detailed information, including tables, is available on the AMS website at www.ams.org/annual1-survey.

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- Non-tenure-track positions under recruitment:
 - Non-tenure-track positions increased 8% overall, up to 1,017 from 937 in the previous year; only groups Math Public Medium, Math Private Small, Statistics, and Master's reported decreases in recruitment in this category.
 - 52% (1,017) of all positions under recruitment were non-tenure-track. Of these 1,017 positions:
 - 92% (931) were open to new PhDs; this is up 4% from last year.
 - 34% (345) were temporary (one-year) appointments; this is down 14% from the prior year.



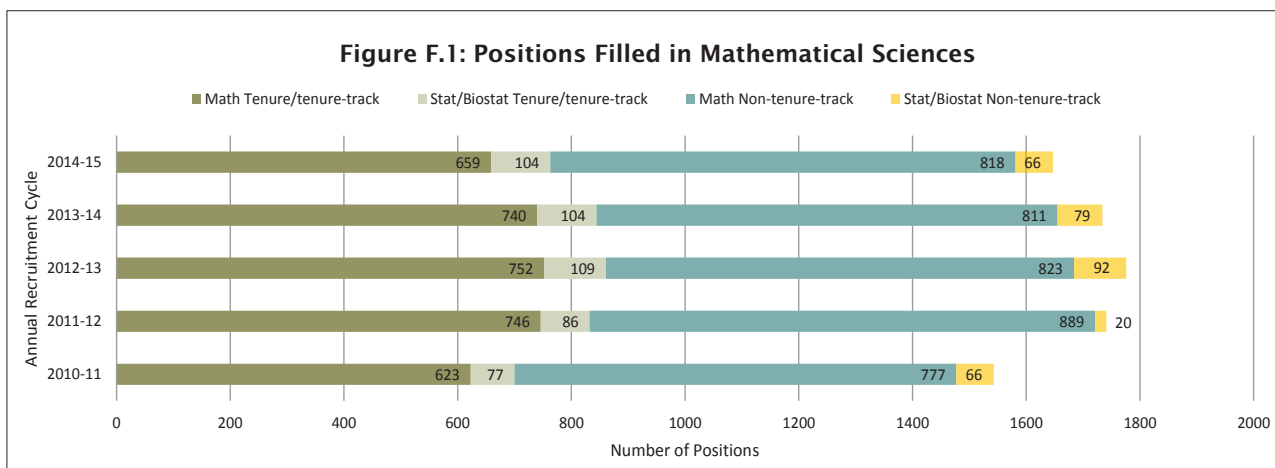
In Mathematics Departments the number of positions under recruitment (1,728) in 2014-15 is comparable with the previous year (1,741) but has dropped for the third consecutive year. As with the overall picture for Mathematical Sciences, recruitment in the 2012-13 through 2014-15 cycles is higher than in the 2009-10 and 2011-12 cycles. In comparison with 2009-10, recruitment in Doctoral departments has increased by 71%, increased in Master's departments increased by 46%, and in Bachelor's departments increased by 52%. Over the longer period since 2004-05 recruitment in Doctoral departments has increased by 26%, in Master's departments decreased by 45%, and in Bachelor's departments increased by 4%. In the same ten-year period, the number of mathematics positions under recruitment has increased by 2%.

Positions Filled

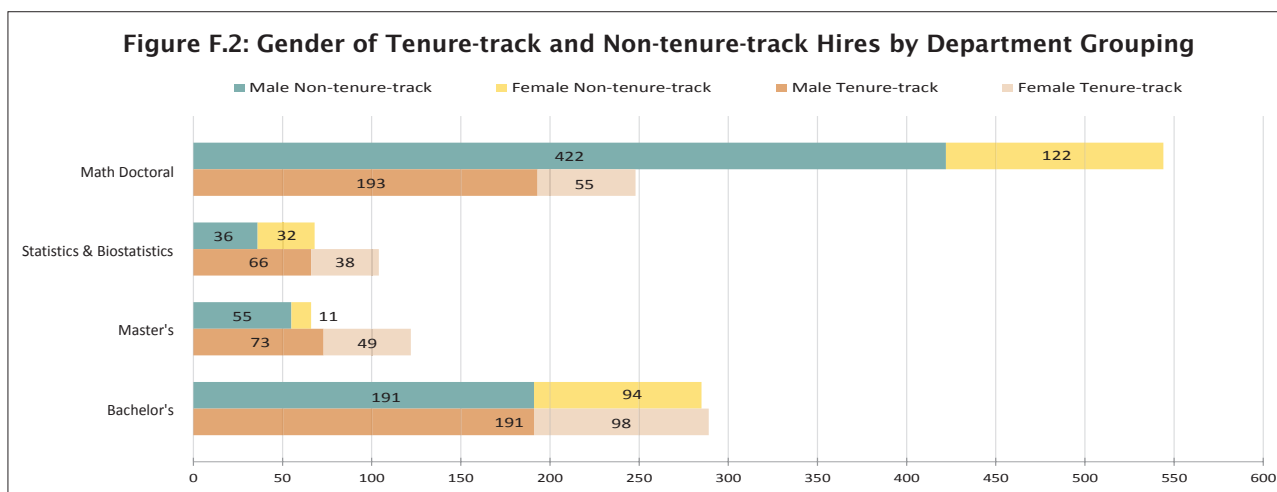
A total of 1,726 full-time positions in Mathematical Sciences were filled during the 2014-15 academic cycle, 1,554 from Mathematics Departments and 172 from Statistics or Biostatistics. Figure F.1 gives a breakdown. The total for Mathematics is up 22% from the 2008-09 cycle and up 4% from the 2003-04 cycle. For Statistics and Biostatistics combined, the number of filled positions is up 31% from 2008-09 and up 55% from 2003-04. One interesting feature implicit in this data is that the success rate for filling mathematical sciences tenure-track positions over the period 2008-2014 is about 82%, whereas the success rate for non-tenure-track is about 97%.

Figure F.2 gives a breakdown on hiring by gender and department grouping. Here are further highlights and comparisons from the data:

- Overall features of hires in mathematical sciences:
 - Of all positions under recruitment, 88% (1,726) were filled. Females hold 29% (499) of those positions.
 - Of all hires, 44% (763) were tenure-track; females constitute 31% (240) of these.
 - Of all hires, 56% (963) were non-tenure track; females constitute 27% (259) of these.
- Tenure-track hires in mathematical sciences:
 - Of the tenure-track positions under recruitment, 82% (763) were filled.
 - Of tenure-track positions filled, 70% (536) were filled by doctoral faculty (i.e., not new PhDs). Of these positions filled by doctoral faculty, 31% went to females. In comparison with last year, all groups except Public Medium, Private Small, Statistics, and Biostatistics reported decreases in tenure-track hires of doctoral faculty.
 - Of the 30% of tenure-track hires who were new PhDs, 33% were female. For comparison, in 2013-14, 28% of tenure-track hires were new PhDs and 39% were female.



- Of tenure-track hires, 27% (208) had a non-tenure-track position last year; of these individuals, 16% were female. All groups except Applied Math and Bachelor's reported increases in tenure-track hires, and this count is 45% higher than the previous year's 143.
 - Of tenure-track hires, 24% (181) held a postdoc last year, and 50% of these postdocs were female. All groups except Statistics reported a decrease in this category, and overall the count is 40% less than the prior year.
 - Non-tenure-track hires:
 - Of the 1,017 non-tenure-track positions under recruitment, 95% were filled.
 - Of non-tenure-track hires, 40% (382) were filled by doctoral faculty (excluding new PhDs); 31% of these doctoral faculty hires were female.
 - Of non-tenure-track hires, 52% (502) were filled by new PhDs; 22% these new PhD hires were female.
 - Of non-tenure-track hires, 8% (79) were filled by non-doctoral faculty; 38% of these non-doctoral hires were female. Over half of these non-doctoral, non-tenure-track hires were in Bachelor's departments; in Doctoral Math departments the number of non-doctoral, non-tenure-track hires decreased by 42% over the previous year.
 - Of non-tenure-track hires, 22% (214) are temporary (one-year); 28% of these temporary hires are female. About half of temporary hires were in Bachelor's departments. Of all groups, the Master's group had the highest percentage (42%) of its non-tenure-track hires in temporary appointments.
 - Of non-tenure-track hires, 41% (391) were in postdoctoral positions; 22% of these postdocs were female.

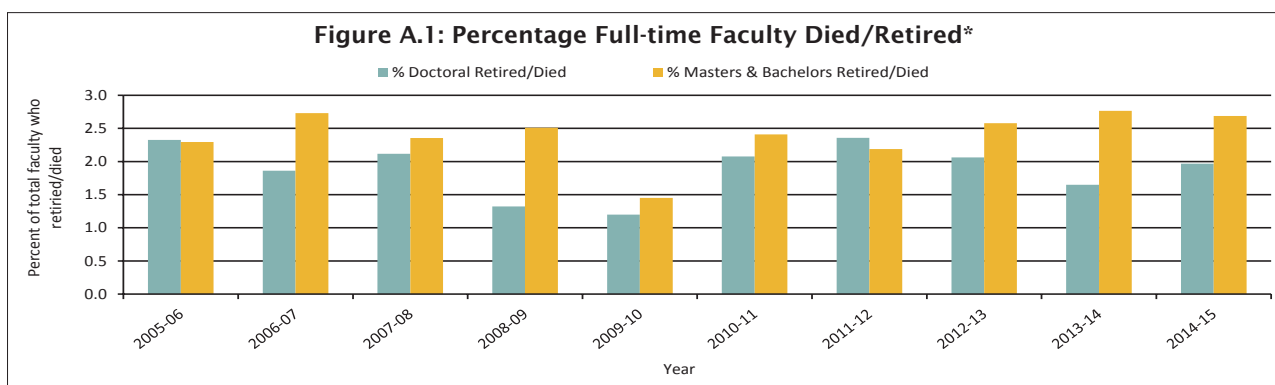


- Female hires:
 - Of all hires, 29% (499) were female; of these women, Bachelor's departments hired 38%, and Doctoral Math departments hired 35%.
 - In the Doctoral Math group, female hires increased by 67% to 177.
 - All groups except Applied Math, Master's, and Bachelor's reported increases in the number of female hires over last year.

- The number of females hired into tenure-track positions dropped by 11% to 240; the number hired into non-tenure-track positions decreased by 3% to 259.
- Females accounted for 31% of all tenure-track and 27% of all non-tenure track hires; last year these percentages were, respectively, 33% and 30%.

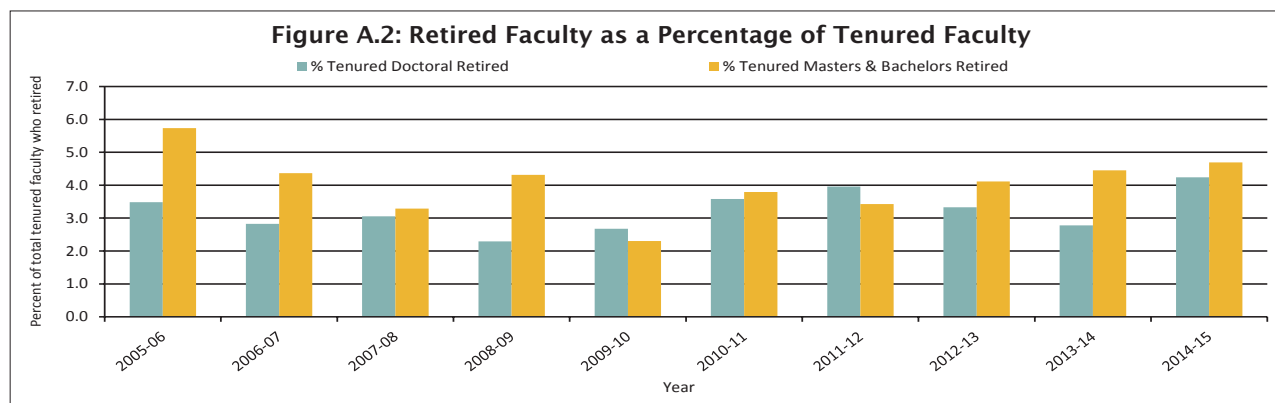
Faculty Attrition

Figure A.1 shows the variation in attrition from deaths and retirements among full-time faculty for the academic years 2005-06 through 2014-15. Attrition rates reached a minimum in 2009-10, a phenomenon likely linked to economic conditions at the time. On average over the period shown, the percentage of faculty in doctoral departments retiring or dying each year is about 1.9%, and in Master's and Bachelor's departments that percentage is about 2.4%.



* 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% for Bachelor's and Master's, and 2.7% for Statistics. The majority of individuals who are reported by their department as retiring are, in fact, members of the tenured faculty. For instance, data collected for 2013-15 indicate that approximately 82% of those retiring were tenured. Figure A.2 provides a ten-year summary.



* Each percentage in this figure is the number of full-time faculty that retired at some point during the academic year (September 1 through August 31) divided by the number of full-time tenured faculty at the start of the academic year.

Here are a few other highlights from the attrition data from the 2014-15 cycle:

- Overall retirements by tenured faculty increased by 7% to 552.
- Deaths and retirements increased by 7% to 587.
- Overall retirements break down by departmental type as follows:
 - 41% (228) were from Bachelor's departments
 - 30% (166) were from Doctoral Math departments
 - 22% (120) were from Master's departments
 - 7% (38) were from Statistics departments

Survey Groups and 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; *Statistics* refers to departments that incorporate (again, with exceptions) “statistics” in the name but do not use “mathematics.”

Starting with reports on the 2012 AMS-ASA-IMS-MAA-SIAM Annual Survey of the Mathematical Sciences, the Joint Data Committee implemented a new method for grouping doctorate-granting mathematics departments. These departments are first grouped into those at public institutions and those at private institutions. These groups are further subdivided based on the size of their doctoral program as reflected in the average annual number of PhDs awarded between 2000 and 2010, based on their reports to the Annual Survey during that period.

For further details on the change in the doctoral department groupings, see the article in the October 2012 issue of *Notices of the AMS* at www.ams.org/journals/notices/201209/rtx120901262p.pdf.

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 Mathematics consists of doctoral-degree-granting applied mathematics departments.

Statistics consists of doctoral-degree-granting statistics departments.

Biostatistics consists of doctoral-degree-granting biostatistics departments.

Master’s contains US departments granting a Master’s degree as the highest graduate degree.

Bachelor’s 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 contains all US math public, math private, and applied math, Master’s, and Bachelor’s groups above.

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 24 recruiting (92%)
Math. Public Medium	40 of 40 with 34 recruiting (100%)
Math. Public Small	56 of 64 with 47 recruiting (88%)
Math. Private Large	21 of 24 with 19 recruiting (88%)
Math. Private Small	25 of 29 with 22 recruiting (86%)
Applied Math.	20 of 23 with 16 recruiting (87%)
Statistics	46 of 58 with 37 recruiting (79%)
Biostatistics	36 of 46 with 30 recruiting (78%)
Master’s	129 of 175 with 75 recruiting (74%)
Bachelor’s	624 of 1017 with 270 recruiting (61%)
Total	1021 of 1502 with 574 recruiting (68%)

* 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.

Acknowledgements

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 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.

Annual Survey of the Mathematical Sciences

www.ams.org/annual-survey

Table R.1: Recruitment and Hiring of Faculty in the Mathematical Sciences, Fall 2015 by Department Grouping

	Math. Public Large Group	Math. Public Medium Group	Math. Public Small Group	Math. Private Large Group	Math. Private Small Group	Applied Math. Group	Total Doctoral Groups Combined	Master's	Bachelor's	Total Math. Groups Combined	Statistics Group	Biostatistics Group	Statistics & Biostatistics Groups Combined	Total All Groups Combined
Recruited Doctoral Positions Total Number	249	157	163	147	81	61	858	217	653	1728	106	118	224	1952
<i>Standar Error</i>	14	7	10	11	11	8	23	18	27	40	8	15	23	43
Tenured or tenure-track	55	74	76	44	39	20	308	145	338	791	72	72	144	935
Open to new doctoral recipients	33	51	68	32	26	12	222	135	323	680	61	52	113	793
Open to assoc/full level	20	12	15	17	7	7	78	25	44	147	29	37	66	213
Non-tenure-track	194	83	87	103	42	41	550	72	315	937	34	46	80	1017
Open to new doctoral recipients	181	82	80	94	38	39	514	68	278	860	30	41	71	931
Temporary 1-year appointments	33	15	46	16	10	8	128	36	163	327	6	12	18	345
Reported Hires for Above Total number	239	147	143	130	76	57	792	188	574	1554	83	89	172	1726
Tenured or tenure-track Hires	44	63	60	29	35	17	248	122	289	659	55	49	104	763
Male hires	34	48	43	24	28	16	193	73	191	457	38	28	66	523
New doctoral hires	0	2	10	12	0	3	27	19	76	122	24	5	29	151
Not new doctoral hires	34	46	33	12	28	13	166	54	115	335	14	23	37	372
Previously in non-tenure-track	20	25	23	4	22	5	99	27	33	159	10	5	15	174
Previously in postdoc	4	8	8	5	0	7	32	17	40	89	2	0	2	91
Female hires	10	15	17	5	7	1	55	49	98	202	17	21	38	240
New doctoral hires	1	2	5	0	1	0	9	19	42	70	5	1	6	76
Not new doctoral hires	9	13	12	5	6	1	46	30	56	132	12	20	32	164
Previously in non-tenure-track	0	1	1	0	1	0	3	10	13	26	3	5	8	34
Previously in postdoc	8	10	11	4	5	1	39	15	22	76	6	8	14	90
Non-tenure-track Hires	195	84	83	101	41	40	544	66	285	895	28	40	68	963
Male hires	155	64	55	86	27	35	422	55	191	668	21	15	36	704
Doctoral hires	155	64	51	86	27	35	418	45	158	621	19	15	34	655
New doctoral hires	107	39	28	62	15	23	274	26	73	373	14	6	20	393
Not new doctoral hires	48	25	23	24	12	12	144	19	85	248	5	9	14	262
Nondoctoral hires	0	0	4	0	0	0	4	10	33	47	2	0	2	49
Postdoc appointments	118	46	27	54	14	21	280	3	8	291	5	9	14	305
1-year appointments	10	6	18	7	5	3	49	24	69	142	8	3	11	153
Female hires	40	20	28	15	14	5	122	11	94	227	7	25	32	259
Doctoral hires	40	17	17	15	14	5	108	7	82	197	7	25	32	229
New doctoral hires	23	9	6	8	7	4	57	3	33	93	2	14	16	109
Not new doctoral hires	17	8	11	7	7	1	51	4	49	104	5	11	16	120
Nondoctoral hires	0	3	11	0	0	0	14	4	12	30	0	0	0	30
Postdoc appointments	35	10	8	8	3	3	67	0	5	72	0	14	14	86
1-year appointments	2	1	6	0	2	1	12	4	39	55	0	6	6	61
Unfilled positions	11	11	20	17	5	4	68	43	126	237	25	29	54	291

Annual Survey of the Mathematical Sciences

www.ams.org/annual-survey

Table R.2: Summary of Recruitment & Hiring of Faculty, Fall 2015

	Doctoral Math. Groups	Master's and Bachelor's	Statistics & Biostatistics Groups	Total
Doctoral Positions under recruitment				
Total Number	858	870	224	1952
Tenure or tenure-track	308	483	144	935
Open to new doctoral recipients	222	458	113	793
Open to assoc/full level	78	69	66	213
Non-tenure-track	550	387	80	1017
Open to new doctoral recipients	514	346	71	931
1-year appointments	128	199	18	345
Reported Hires for Above, excluding temporary hires				
Total doctoral hires	774	703	170	1647
Tenure or tenure-track	248	411	104	763
Previously in non-tenure-track	102	83	23	208
Previously in postdoc	71	94	16	181
Non-tenure-track	544	351	68	963
1-year appointments	61	136	17	214
Postdoc appointments	347	16	28	391
Total new doctoral hires	367	291	71	729
Tenured or tenure-track	36	156	35	227
Male	301	194	49	544
Tenured or tenure-track	27	95	29	151
Female	66	97	22	185
Tenured or tenure-track	9	61	6	76
Total not-new doctoral hires	407	412	99	918
Tenured or tenure-track	212	255	69	536
Male	310	273	51	634
Tenured or tenure-track	166	169	37	372
Female	97	139	48	284
Tenured or tenure-track	46	86	32	164
Total Non-doctoral hires	18	59	2	79
Male	4	43	2	49
Female	14	16	0	30

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Table R.3: Summary of Doctoral Faculty Positions under Recruitment and Filled with the Percentage of Tenured or tenure-track, Fall 2015

Positions	Doctoral Math. Groups	Master's and Bachelor's	Statistics & Biostatistics Groups	Total
Recruited tenured or tenure-track positions open to new doctoral recipients	222	458	113	793
% Tenured or tenure-track	72%	95%	78%	85%
Recruited positions filled by new doctoral recipients	367	291	71	729
% Tenured or tenure-track	10%	54%	49%	31%
Recruited positions filled by not-new doctoral recipients	407	412	99	918
% Tenured or tenure-track	52%	62%	70%	58%

Annual Survey of the Mathematical Sciences

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Table R.4: Summary of Total Recruitment & Hiring of Faculty in the Mathematical Sciences by Department Grouping for Fall 2015

	Math. Public Large Group	Math. Public Medium Group	Math. Public Small Group	Math. Private Large Group	Math. Private Small Group	Applied Math. Group	Total Doctoral Groups Combined	Master's	Bachelor's	Total Math. Groups Combined	Statistics Group	Biostatistics Group	Statistics & Biostatistics Groups Combined	Total All Groups Combined
Total Doctoral Positions Under Recruitment	249	157	163	147	81	61	858	217	653	1728	106	118	224	1952
<i>Standard Error</i>	14	7	10	11	11	8	23	18	27	40	8	15	23	43
Tenured or tenure-track Hires	55	74	76	44	39	20	308	145	338	791	72	72	144	935
Non-tenure-track Hires	194	83	87	103	42	41	550	72	315	937	34	46	80	1017
Total Hires	239	147	143	130	76	57	792	188	574	1554	83	89	172	1726
Tenured or tenure-track Hires	44	63	60	29	35	17	248	122	289	659	55	49	104	763
Non-tenure-track Hires	195	84	83	101	41	40	544	66	285	895	28	40	68	963
Total Hires by Gender	239	147	143	130	76	57	792	188	574	1554	83	89	172	1726
Male hires	189	112	98	110	55	51	615	128	382	1125	59	43	102	1227
Female hires	50	35	45	20	21	6	177	60	192	429	24	46	70	499
Unfilled positions	11	11	20	17	5	4	68	43	126	237	25	29	54	291

Annual Survey of the Mathematical Sciences

www.ams.org/annual-survey

Table R.5: Percentage of Females Hired into Positions Requiring a Doctorate for Fall 2015 in the Mathematical Sciences

	Math. Public Large Group	Math. Public Medium Group	Math. Public Small Group	Math. Private Large Group	Math. Private Small Group	Applied Math. Group	Total Doctoral Groups Combined	Master's	Bachelor's	Total Math. Groups Combined	Statistics Group	Biostatistics Group	Statistics & Biostatistics Groups Combined	Total All Groups Combined
Total Hires	239	147	143	130	76	57	792	188	574	1554	83	89	172	1726
% Female	21%	24%	31%	15%	28%	11%	22%	32%	33%	28%	29%	52%	41%	29%
Females as a percentage of hires														
Tenured or tenure-track	23%	24%	28%	17%	20%	6%	22%	40%	34%	31%	31%	43%	37%	31%
New doctoral	100%	50%	33%	0%	100%	0%	25%	50%	36%	36%	17%	17%	17%	33%
Not new doctoral	21%	22%	27%	29%	18%	7%	22%	36%	33%	28%	46%	47%	46%	31%
Previously in non-tenure-track	0%	4%	4%	0%	4%	0%	3%	27%	28%	14%	23%	50%	35%	16%
Previously in postdoc	67%	56%	58%	44%	100%	13%	55%	47%	35%	46%	75%	100%	88%	50%
Non-tenured-track	21%	24%	34%	15%	34%	13%	22%	17%	33%	25%	25%	63%	47%	27%
New doctoral hires	18%	19%	18%	11%	32%	15%	17%	10%	31%	20%	13%	70%	44%	22%
Not new doctoral hires	26%	24%	32%	23%	37%	8%	26%	17%	37%	30%	50%	55%	53%	31%
Nondoctoral hires	-	100%	73%	-	-	-	78%	29%	27%	39%	0%	-	0%	38%
Postdoc appointments	23%	18%	23%	13%	18%	13%	19%	0%	38%	20%	0%	61%	50%	22%
1-year appointments	17%	14%	25%	0%	29%	25%	20%	14%	36%	28%	0%	67%	35%	29%

Annual Survey of the Mathematical Sciences

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Table A.1: Faculty Deaths & Retirements, Fall 2015

	Math. Public Large Group	Math. Public Medium Group	Math. Public Small Group	Math. Private Large Group	Math. Private Small Group	Applied Math. Group	Total Doctoral Groups Combined	Master's	Bachelor's	Total Math. Groups Combined	Statistics Group	Biostatistics Group	Total Statistics & Biostatistics Combined	Total All Groups
Full-time faculty who retired or died	45	52	52	15	15	1	180	127	238	545	30	12	42	587
<i>Standard Error</i>	3	2	5	2	2	1	7	10	13	18	5	3	5	19
% of Full-time faculty	2.1%	2.6%	2.3%	1.4%	1.8%	0.2%	1.6%	2.8%	2.6%	2.4%	0.3%	1.1%	1.8%	2.4%
Died	3	6	3	1	1	0	14	7	10	31	3	1	4	35
Retired	42	46	49	14	14	1	166	120	228	514	27	11	38	552
Tenured Faculty	34	37	47	14	10	1	143	95	185	423	27	3	30	453

Table A.2: Tenured Faculty Retirements, Fall 2015

	Math. Public Large Group	Math. Public Medium Group	Math. Public Small Group	Math. Private Large Group	Math. Private Small Group	Applied Math. Group	Total Doctoral Math. Groups	Master's	Bachelor's	Total Math. Groups Combined	Statistics Group	Biostatistics Group	Total Statistics & Biostatistics Combined	Total All Groups
Full-time Tenured faculty who retired	34	37	47	14	10	1	143	95	185	423	27	3	30	423
<i>Standard Error</i>	2	2	5	2	2	1	6	8	12	16	4	1	5	16
% of Full-time tenured faculty	2.9%	3.4%	3.9%	2.6%	2.1%	0.3%	3.0%	3.8%	3.8%	3.5%	3.6%	0.9%	2.8%	1.7%