

2004 Annual Survey of the Mathematical Sciences

(Second Report)

Updated Report on the 2003–2004 U.S. Doctoral Recipients
Starting Salary Survey of the 2003–2004 U.S. Doctoral Recipients

Ellen E. Kirkman, James W. Maxwell, and Colleen A. Rose

Update on the 2003–2004 U.S. Doctoral Recipients

Introduction

The Annual Survey of the Mathematical Sciences collects information each year about departments, faculties, and students in the mathematical sciences at four-year colleges and universities in the United States. Definitions of the various groups surveyed in the Annual Survey can be found on page 756 of this report.

This Second Report includes data from two parts of the 2004 Annual Survey. First, we update information about new doctoral recipients reported earlier in the February 2005 issue. Second, we present the starting salaries of the new doctoral recipients who responded to a follow-up survey.

The names of the 2003–2004 doctoral recipients and their thesis titles were published in “Doctoral Degrees Conferred” (*Notices*, February 2005, pages 264–82). This list has been supplemented by forty additional new doctorates. The supplemental listing appears at the end of this report on pages 757–8.

Information about recipients of doctoral degrees awarded between July 1, 2003, and June 30, 2004, was collected from doctorate-granting departments beginning in late spring 2004 and from a follow-up census of individual degree recipients beginning in October. The “2004 Annual Survey First Report” (*Notices*, February 2005, pages 236–51) presented survey results obtained about new doctoral recipients from the departments. Here we update information for new doctoral recipients using data

This Second Report of the 2004 Annual Survey gives an update of the 2003–2004 new doctoral recipients from the First Report, which appeared in the *Notices of the AMS* in February 2005, pages 236–51. Prior to 2000 this report included information about faculty size, departmental enrollments, majors, and graduate students for departments of mathematical sciences in four-year colleges and universities in the United States. This information is now published as a third report in the September *Notices of the AMS*. The First Report gave salary data for faculty members in these same departments. It also had a section on new doctoral recipients in statistics that is not updated here.

The 2004 Annual Survey represents the forty-eighth in an annual series begun in 1957 by the American Mathematical Society. The 2004 Survey is under the direction of the Data Committee, a joint committee of the American Mathematical Society, the American Statistical Association, the Institute of Mathematical Statistics, and the Mathematical Association of America. The current members of this committee are Amy Cohen-Corwin, Donald M. Davis, Nicholas M. Ercolani, J. Douglas Faires, Naresh Jain, Donald R. King, Ellen E. Kirkman (chair), David J. Lutzer, James W. Maxwell (ex officio), Polly Phipps, David E. Rohrlich, and Henry Schenck. The committee is assisted by AMS survey analyst Colleen A. Rose. Comments or suggestions regarding this Survey Report may be directed to the committee.

gathered with a questionnaire, Employment Experiences of New Doctoral Recipients (EENDR). The EENDR was sent in early October 2004 to all new doctoral recipients whose address was known. When a new doctoral recipient did not respond or no address was known, information supplied by the department was used.

Ellen E. Kirkman is professor of mathematics, Wake Forest University. James W. Maxwell is AMS associate executive director for Meetings and Professional Services. Colleen A. Rose is AMS survey analyst.

Highlights

- There were 1,081 doctoral recipients from U.S. institutions for 2003–2004, up 44 (4%) from the previous year. This is the highest number of new Ph.D.'s reported since 1999–2000.
- The number of doctoral recipients who are U.S. citizens is 513, up 14 (3% increase) from last year's number; this year's number is the highest number reported since 2000–2001. The percentage of U.S. citizens among all doctoral recipients this year is 47%, down from 48% last year. The number of new doctoral recipients who are not U.S. citizens is 568, up 30 from last year's number.
- Females totaled 333 (31% of all new doctoral recipients), up in number and percentage from 308 (30%) last year. Of the 513 U.S. citizen new doctoral recipients, 166 are female (32%, the same as last year). The highest percentage of females among the annual counts of U.S. doctoral recipients was 34%, reported for 1998–1999.
- The number of doctoral recipients whose employment status is unknown is 119, down 74 from last year's number of 193.
- The final unemployment rate for 2003–2004 doctoral recipients was 4.4%.
- Of the 962 new doctoral recipients whose employment status is known, 910 reported having employment in fall 2004 with 792 (87%) finding employment in the U.S.; last year this percentage was 86%.
- The number of new doctoral recipients taking positions in U.S. business and industry was 110 in fall 2004, an 11% increase from last year's number, which was at a four-year low. The percentage of doctoral recipients employed in the U.S. taking nonacademic positions has decreased each of the past five years, from 28% in fall 2000 to 15% in fall 2004.
- The number of doctoral recipients taking U.S. academic positions has reached a five-year high of 655, up from 551 last year. Doctoral hires into U.S. academic positions are up in all groups except Group I (Private) (down to 71 from 84 last year) and Group B (down to 104 from 108 last year); the biggest percentage increases are in Group Va (111%) and Group IV (69%). Doctoral hires into non-U.S. academics positions are also up.
- Non-U.S. citizens accounted for 54% of those employed in the U.S. (last year this percentage was 44%).
- There were 525 new doctoral recipients responding to the EENDR survey; of the 449 who found employment in the U.S., 49% reported obtaining a permanent position (last year this percentage was 54%). This is the lowest percentage reported in the last five years and the only time in the last five years when the number of temporary hires exceeded the number of permanent hires.
- The percentage of temporarily employed respondents who reported taking a postdoctoral position increased from 76% in fall 2003 to 77% in fall 2004. The number of respondents who reported taking a postdoctoral position in fall 2004 was 176, up from 164 for fall 2003.

Updated Employment Status of 2003–2004 U.S. Doctoral Recipients

Table 1A shows the fall and final counts of doctoral recipients in the mathematical sciences awarded by U.S. institutions in each year from 1994 through 2004. Final counts include those new doctoral recipients reported from departments who missed the deadline for inclusion in the First Report. This year the total number of new doctoral recipients is 1,081, up from the previous year by 44.

Table 1A: U.S. Doctoral Recipients: Fall and Final Counts

Year	Fall	Final
1994–1995	1148	1157
1995–1996	1098	1099
1996–1997	1123	1130
1997–1998	1163	1176
1998–1999	1133	1135
1999–2000	1119	1127
2000–2001	1008	1065
2001–2002	948	960
2002–2003	1017	1037
2003–2004	1041	1081

Table 1B: U.S. Doctoral Recipients: Citizenship

Year	U.S.	Non-U.S.	TOTAL
1999–2000	566	561	1127
2000–2001	532	533	1065
2001–2002	428	532	960
2002–2003	499	538	1037
2003–2004	513	568	1081

Table 1B shows trends in the number of new doctoral recipients for the past five years broken down by U.S. citizens and non-U.S. citizens. This year the number of new doctoral recipients who are U.S. citizens is 513, an increase of 14 over last year and the highest number reported since 2000–2001. The number of non-U.S. citizen new doctoral recipients has reached a five-year high of 568, but it was 679 in 1992–1993.

Table 1C: 2003–2004 U.S. Doctoral Recipients by Type of Degree-Granting Department

Group ¹	I (Pu)	I (Pr)	II	III	IV	Va
Number	205	187	223	111	265	90
Percent	19	17	21	10	25	8

¹ For definitions of groups see page 756.

Table 1C gives a breakdown of the 1,081 doctoral degrees awarded in the mathematical sciences

**Table 2A: Fall 2004 Employment Status of 2003–2004 U.S. Doctoral Recipients:
Field of Thesis (updated April 2005)**

TYPE OF EMPLOYER	FIELD OF THESIS												TOTAL	
	Algebra Number Theory	Real, Comp., Funct., & Harmonic Analysis	Geometry/ Topology	Discr. Math./ Combin./ Logic/ Comp. Sci.	Probability	Statistics/ Biostat.	Applied Math.	Numerical Analysis/ Approxi- mations	Linear Nonlinear Optim./ Control	Differential, Integral, & Difference Equations	Math. Educ.	Other/ Unknown		
Group I (Public) ¹	19	4	9	5	3	4	9	7	1	10	0	0	71	
Group I (Private)	10	6	18	3	2	0	6	0	0	9	0	1	55	
Group II	16	8	10	6	2	1	6	3	0	18	0	0	60	
Group III	4	3	4	4	2	10	2	1	0	1	3	0	34	
Group IV	0	0	0	0	2	63	1	0	0	0	0	0	66	
Group Va	1	0	0	3	1	1	3	6	0	3	1	0	19	
Master's	11	9	3	7	2	15	5	8	3	3	2	0	68	
Bachelor's	15	13	14	11	4	15	6	8	3	11	4	0	104	
Two-Year College	6	5	6	1	0	1	0	3	0	2	0	0	24	
Other Academic Dept.	5	2	6	8	3	57	19	7	4	3	6	0	120	
Research Institute/ Other Nonprofit	2	2	5	3	1	12	3	3	0	3	0	0	34	
Government	3	2	1	4	0	8	4	2	2	1	0	0	27	
Business and Industry	9	2	5	8	6	56	15	4	1	4	0	0	110	
Non-U.S. Academic	19	11	14	12	3	10	11	5	5	17	0	1	108	
Non-U.S. Nonacademic	1	0	0	1	0	5	2	0	0	1	0	0	10	
Not Seeking Employment	1	0	0	1	0	6	0	1	0	1	0	0	10	
Still Seeking Employment	8	1	4	7	1	10	6	1	2	2	0	0	42	
Unknown (U.S.)	11	6	3	7	1	20	3	6	2	4	1	0	64	
Unknown (non-U.S.) ²	10	6	3	8	2	17	4	3	0	2	0	0	55	
TOTAL	151	80	105	99	35	311	105	68	23	85	17	2	1081	
Column	Male	113	58	75	74	28	186	80	49	19	56	8	2	748
Subtotals	Female	38	22	30	25	7	125	25	19	4	29	9	0	333

¹ For definitions of groups see page 756.

² Includes those whose status is reported as "unknown" or "still seeking employment".

**Table 2B: Fall 2004 Employment Status of 2003–2004 U.S. Doctoral Recipients:
Type of Degree-Granting Department (updated April 2005)**

TYPE OF EMPLOYER	TYPE OF DOCTORAL DEGREE-GRANTING DEPARTMENT							TOTAL	Row Subtotals	
	Group I (Public) Math.	Group I (Private) Math.	Group II Math.	Group III Math.	Group IV Statistics	Group Va Applied Math.	Male		Female	
Group I (Public) ¹	33	25	8	0	1	4	71	54	17	
Group I (Private)	15	30	6	0	0	4	55	45	10	
Group II	21	16	18	2	1	2	60	41	19	
Group III	5	8	6	9	6	0	34	21	13	
Group IV	1	1	0	2	61	1	66	48	18	
Group Va	1	3	1	0	0	14	19	15	4	
Master's	11	3	26	18	9	1	68	46	22	
Bachelor's	14	10	51	17	8	4	104	71	33	
Two-Year College	4	0	9	10	1	0	24	15	9	
Other Academic Dept.	6	14	14	15	51	20	120	70	50	
Research Institute/ Other Nonprofit	7	8	5	0	12	2	34	20	14	
Government	5	3	7	1	8	3	27	15	12	
Business and Industry	13	15	10	10	53	9	110	76	34	
Non-U.S. Academic	33	23	25	10	8	9	108	83	25	
Non-U.S. Nonacademic	0	4	0	0	4	2	10	9	1	
Not Seeking Employment	1	1	2	2	4	0	10	4	6	
Still Seeking Employment	6	8	12	5	7	4	42	28	14	
Unknown (U.S.)	15	8	16	5	15	5	64	46	18	
Unknown (non-U.S.) ²	14	7	7	5	16	6	55	41	14	
TOTAL	205	187	223	111	265	90	1081	748	333	
Column	Male	156	137	159	72	158	66	748		
Subtotals	Female	49	50	64	39	107	24	333		

¹ For definitions of groups see page 756.

² Includes those whose status is reported as "unknown" or "still seeking employment".

Table 2C: Field of Thesis of 2003–2004 U.S. Doctoral Recipients: by Type of Degree-Granting Department (Updated April 2005)

TYPE OF DOCTORAL DEGREE-GRANTING DEPARTMENT	FIELD OF THESIS											TOTAL	
	Algebra Number Theory	Real, Comp., Funct., & Harmonic Analysis	Geometry/Topology	Discr. Math./Combin./Logic/Comp. Sci.	Probability	Statistics/Biostat.	Applied Math.	Numerical Analysis/Approximations	Linear Nonlinear Optim./Control	Differential, Integral, & Difference Equations	Math. Educ.		Other/Unknown
Group I (Public) ¹	56	26	33	21	9	6	17	11	1	25	0	0	205
Group I (Private)	45	15	35	22	10	6	30	4	1	18	0	1	187
Group II	36	31	29	27	4	10	23	28	12	19	4	0	223
Group III	14	8	8	18	2	19	8	11	2	9	12	0	111
Group IV	0	0	0	0	6	256	3	0	0	0	0	0	265
Group Va	0	0	0	11	4	14	24	14	7	14	1	1	90
TOTAL	151	80	105	99	35	311	105	68	23	85	17	2	1081

¹ For definitions of groups see page 756.

Table 2D: Percentage of Total Employed New Doctoral Recipients by Type of Employer

	U.S. Employed		Non-U.S. Employed		TOTAL NUMBER EMPLOYED
	Academic	Nonacademic	Academic	Nonacademic	
Fall 2000	62%	28%	10%	1%	957
Fall 2001	63%	27%	9%	2%	914
Fall 2002	67%	22%	10%	1%	829
Fall 2003	70%	17%	12%	2%	792
Fall 2004	72%	15%	12%	1%	910

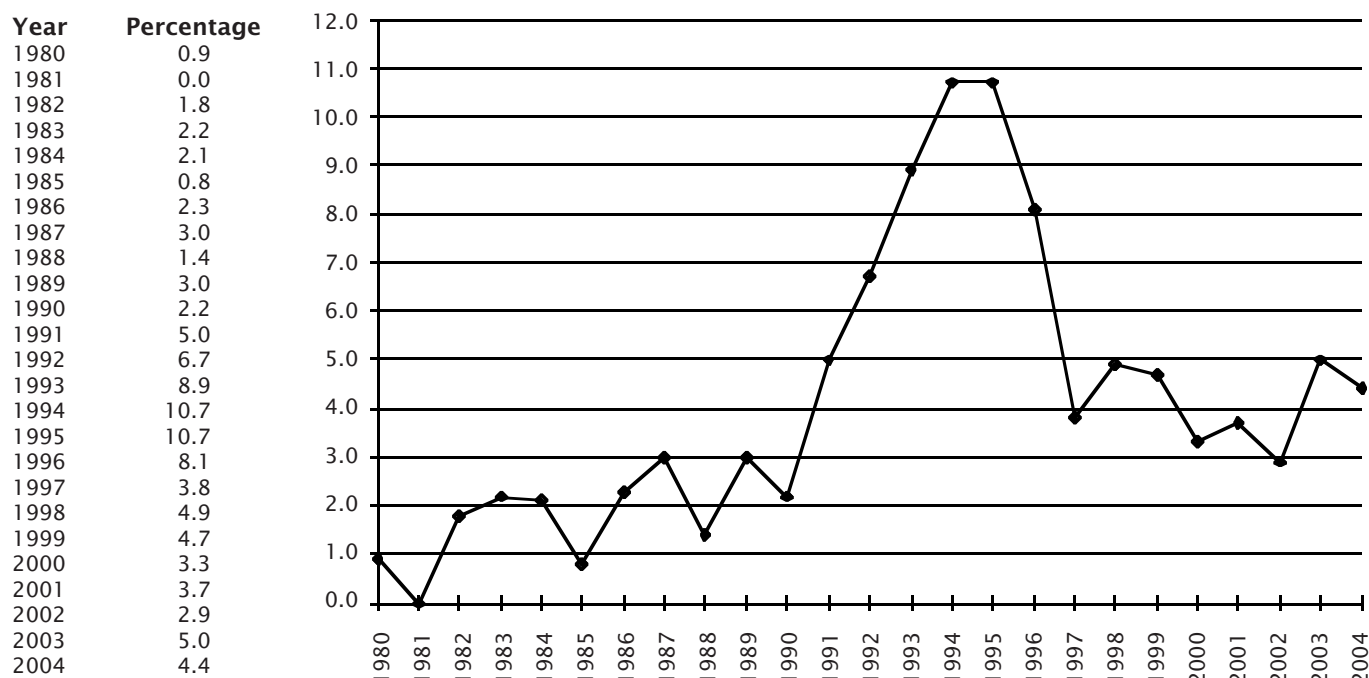
between July 1, 2003, and June 30, 2004, by type of degree-granting department.

Tables 2A, 2B, and 2C display updates of employment data, found in these same tables in the First Report, for the fall count of 2003–2004 doctoral

recipients plus forty additional doctoral recipients reported late. These tables are partitioned by field of thesis research, by the survey group of their degree-granting department, and by type of employer. New doctoral recipients are grouped by field of thesis using the *Mathematical Reviews* 2000 Mathematics Subject Classification list. A complete list of these groups is available on the AMS website at www.ams.org/employment/Thesis_groupings.pdf. At the time of this Second Report, the fall 2004 employment status of 962 of the 1,081 doctoral recipients was known.

The fall 2004 unemployment rate for new doctoral recipients, based on information gathered by the time of the Second Report, was 4.4%. Figure 1 presents the fall 1980 through fall 2004 trend in the final unemployment rate of new doctoral recipients. The counts on which these rates are determined do

Figure 1: Percentage of New Doctoral Recipients Unemployed¹



¹ As reported in the respective Annual Survey Second Reports.

Table 3A: New Doctoral Recipients Taking Employment in the U.S.

Group ¹	Type of Degree-Granting Department												TOTAL	
	I (Pu)		I (Pr)		II		III		IV		Va			
	Academia	Business/Industry	Academia	Business/Industry	Academia	Business/Industry	Academia	Business/Industry	Academia	Business/Industry	Academia	Business/Industry	Academia	Business/Industry
Fall 2000	144	33	82	28	126	37	79	24	131	83	28	18	590	223
Fall 2001	159	28	71	15	126	27	80	26	108	75	30	23	574	194
Fall 2002	133	18	86	12	107	19	91	7	102	65	34	15	553	136
Fall 2003	123	19	90	14	118	5	61	8	119	46	40	7	551	99
Fall 2004	118	13	118	15	144	10	73	10	150	53	52	9	655	110

¹ For definitions of groups see page 756.

not include those new doctoral recipients whose fall employment status was unknown at the time of the Second Report. After spiking to a high of 193 last year, this year the number of recipients whose employment status was reported as unknown dropped to 119.

Of the 962 new doctoral recipients whose employment is known, 792 were employed in the U.S., 118 were employed outside the U.S., 42 were still seeking employment, and 10 were not seeking employment.

Table 2D presents the trend in the percentage of employed new doctoral recipients by type of employer for the last five years. Academic employment includes those employed by research institutes and other nonprofits. The percentage of the total employed new doctoral recipients that are in U.S. academic positions has increased in each of the last five years, and consequently the percentage of the total employed in U.S. nonacademic positions (U.S. government, U.S. business and industry, and non-U.S. nonacademic) has decreased each of the past five years.

Among new doctoral recipients who are employed, the percentage taking nonacademic employment varied significantly by field of thesis. For those whose field of thesis is in the first three columns in Table 2A, this percentage is the lowest at 8% (down from 11%), while the percentage for those with theses in probability or statistics is the highest at 26% (down from 30%).

Table 3A shows that the fall 2004 total number of doctoral recipients taking positions in business or industry is 110; this number reflects an overall increase of 11% since last year. All groups have shown an increase in number of graduates finding employment in business and industry, except Group I Public.

Table 3B shows that the number of new doctoral recipients taking U.S. academic positions has increased to a five-year high of 655, from 551 in 2003. Doctoral hires into U.S. academic positions are up in all groups except Group I Private (down to 71 from 84 last year) and Group B (down to 104

Table 3B: New Doctoral Recipients Taking U.S. Academic Positions

Group ¹	Type of Hiring Department					TOTAL
	I-III	IV	Va	M&B	Other	
Fall 2000	216	51	11	180	132	590
Fall 2001	214	49	11	178	122	574
Fall 2002	222	45	10	148	128	553
Fall 2003	216	39	9	158	129	551
Fall 2004	220	66	19	172	178	655

¹ For definitions of groups see page 756.

Table 3C: Females as a Percentage of 2003-2004 U.S. Doctoral Recipients

% Female	Degree-Granting Department						TOTAL
	I (Pu)	I (Pr)	II	III	IV	Va	
Produced	24%	27%	29%	35%	40%	27%	31%
Hired	24%	18%	32%	38%	27%	21%	27%

from 108 last year); the biggest percentage increases are in Group Va (111%) and Group IV (69%). Doctoral hires into non-U.S. academic positions are also up.

Table 3C gives information about the production and hiring of female new doctoral recipients in the doctoral-granting departments of this survey. From Table 3C we see that the percentage of females hired ranges from a high of 38% in Group III to a low of 18% in Group I (private). The percentage of female new doctoral recipients produced is highest in Group IV (40%).

Updated Information about 2003-2004 U.S. Doctoral Recipients by Sex and Citizenship

Tables 3D and 3E show the sex and citizenship of the 1,081 new doctoral recipients and the fact that 792 new doctoral recipients found jobs in the U.S. this year. This is 87% of the 910 new doctoral recipients known to have jobs in fall 2004. Last year this percentage was 86%.

Table 3D: Citizenship of 2003–2004 Male U.S. Doctoral Recipients by Fall 2004 Employment Status

TYPE OF EMPLOYER	CITIZENSHIP				TOTAL MALE DOCTORAL RECIPIENTS
	U.S. CITIZENS	NON-U.S. CITIZENS			
		Permanent Visa	Temporary Visa	Unknown Visa	
U.S. Employer	242	39	244	12	537
U.S. Academic	197	27	213	9	446
Groups ¹ I, II, III, and Va	76	11	86	3	176
Group IV	12	2	30	4	48
Non-Ph.D. Department	105	14	81	2	202
Research Institute/Other Nonprofit	4	0	16	0	20
U.S. Nonacademic	45	12	31	3	91
Non-U.S. Employer	56	1	31	4	92
Non-U.S. Academic	52	1	28	2	83
Non-U.S. Nonacademic	4	0	3	2	9
Not Seeking Employment	2	1	1	0	4
Still Seeking Employment	16	2	10	0	28
Subtotal	316	43	286	16	661
Unknown (U.S.)	30	1	12	3	46
Unknown (non-U.S.) ²	1	1	28	11	41
TOTAL	347	45	326	30	748

¹ For definitions of groups see page 756.

² Includes those whose status is reported as "unknown" or "still seeking employment".

Table 3E: Citizenship of 2003–2004 Female U.S. Doctoral Recipients by Fall 2004 Employment Status

TYPE OF EMPLOYER	CITIZENSHIP				TOTAL FEMALE DOCTORAL RECIPIENTS
	U.S. CITIZENS	NON-U.S. CITIZENS			
		Permanent Visa	Temporary Visa	Unknown Visa	
U.S. Employer	126	22	102	5	255
U.S. Academic	105	19	81	4	209
Groups ¹ I, II, III, and Va	25	8	29	1	63
Group IV	11	3	4	0	18
Non-Ph.D. Department	64	8	39	3	114
Research Institute/Other Nonprofit	5	0	9	0	14
U.S. Nonacademic	21	3	21	1	46
Non-U.S. Employer	18	0	8	0	26
Non-U.S. Academic	18	0	7	0	25
Non-U.S. Nonacademic	0	0	1	0	1
Not Seeking Employment	4	0	2	0	6
Still Seeking Employment	7	4	3	0	14
Subtotal	155	26	115	5	301
Unknown (U.S.)	9	3	4	2	18
Unknown (non-U.S.) ²	2	0	10	2	14
TOTAL	166	29	129	9	333

¹ For definitions of groups see page 756.

² Includes those whose status is reported as "unknown" or "still seeking employment".

Sex and citizenship are known for all of the 1,081 new doctoral recipients. The final count of new doctoral recipients who are U.S. citizens is 513 (47%) (down from 48% last year). For the last five years this figure has remained very close to 50%, the largest percentage reported by the Annual Survey since the mid-1980s. Pages 241–4 of the First Report present further information related to the citizenship of the 2003–2004 new doctoral recipients.

Of the 513 U.S. citizen new doctoral recipients reported for 2003–2004, 166 are female and 347 are male. While females accounted for 32% of the U.S. citizen total both this year and last year, both

the number of female U.S. citizens and the number of male U.S. citizens represent an increase over last year's counts of 158 and 341, respectively.

Table 3F shows that non-U.S. citizens accounted for 54% of those employed in the U.S. (last year this percentage was 44%). U.S. academic doctoral departments, Groups I through Va, hired 41% U.S. citizens, while groups M, B, and all other academic departments hired 51% U.S. citizens (last year these percentages were 52% and 61%, respectively). U.S. citizens represented 48% of those hired into nonacademic positions (last year 56%). Among the 792 new 2003–2004 doctoral recipients employed in the U.S., 17% took nonacademic employment

Table 3F: Number of 2003–2004 Doctoral Recipients Employed in the U.S. by Citizenship and Type of Employer

U.S. EMPLOYER	CITIZENSHIP		TOTAL
	U.S.	Non-U.S.	
Academic, Groups I–Va	124	181	305
Academic, Other	178	172	350
Nonacademic	66	71	137
TOTAL	388	424	792

(government or business and industry.) This percentage is down from 19% in 2002–2003 and from 24% in 2001–2002.

New Information from the EENDR Survey

Of the 1,041 new doctoral recipients reported in the First Report, the 914 whose addresses were known were sent the Employment Experiences of New Doctoral Recipients (EENDR) survey in October 2004, and 525 (50%) responded. The response rates varied considerably among the various subgroups of new doctoral recipients defined by their employment status as reported by departments. Among those who were employed, the highest response rate, 62%, was from those in academia in the U.S., while the lowest, 38%, was from those in non-U.S. nonacademic.

The EENDR gathered details on employment experiences not available through departments. The rest of this section presents additional information available on this subset of the 2003–2004 doctoral recipients.

Table 4A provides the trend in EENDR respondents taking permanent and temporary positions in the U.S for fall 2000 through fall 2004. This year we see that among the 449 employed in the U.S., 220 reported obtaining a permanent position and 229 a temporary position; this is the only time in the last five years when the number of temporary hires exceeded the number of permanent hires. Of the 229 in temporary positions, 81 (35%) reported taking temporary employment because a suitable permanent position was not available, and 176 (77%) classified their position as postdoctoral. Of the 176 respondents taking positions they classified as postdoctoral, 49 (28%) reported that a suitable permanent position was not available.

Table 4A: Number (and Percentage) of Annual EENDR Respondents Taking U.S. Positions by Job Status

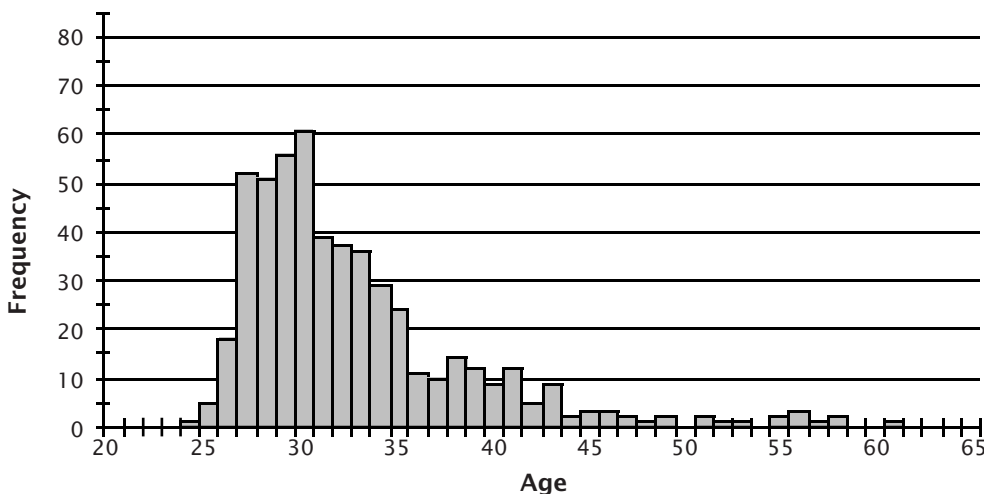
	U.S. Employed					
	Permanent Total	Temporary Total	Temporary			Unknown
			Permanent not available	Postdoctoral		
				Total	Permanent not available	
Fall 2000	317(59)	218(41)	92(42)	157(72)	55(35)	1
Fall 2001	266(56)	205(43)	107(52)	143(70)	42(29)	2
Fall 2002	264(52)	245(48)	90(37)	203(83)	69(34)	1
Fall 2003	253(54)	216(46)	87(40)	164(76)	53(32)	--
Fall 2004	220(49)	229(51)	81(35)	176(77)	49(28)	--

Table 4B: Percentage of Annual EENDR Respondents Taking U.S. Positions by Employment Sector within Job Status

	U.S. Employed					
	Permanent			Temporary		
	Academia	Government	Business/Industry	Academia	Government	Business/Industry
Fall 2000	59%	4%	36%	95%	2%	2%
Fall 2001	62%	6%	32%	95%	4%	--
Fall 2002	70%	6%	23%	93%	6%	1%
Fall 2003	76%	4%	20%	94%	3%	3%
Fall 2004	72%	5%	23%	97%	3%	--

Table 4B shows the employment trends of permanent and temporary positions broken down by sector for the last five years. After steadily increasing over the last four years, the percentage of permanently employed EENDR respondents taking employment in academia has declined this year, and there was an offsetting increase in the proportion of permanently employed EENDR

Figure 2: Age Distribution of 2003–2004 EENDR Respondents



respondents taking positions in business and industry.

Among the 220 who reported obtaining a permanent position in the U.S. in fall 2004, 72% were employed in academia (including 1% in research institutes and other nonprofits), 5% in government, and 23% in business or industry. Women held 36% of the permanent positions.

Among the 229 individuals with temporary employment in the U.S. this year, 97% were employed in academia (including 9% in research institutes and other nonprofits), less than 1% in government, and 3% in business or industry.

Figure 2 gives the age distribution of the 525 new doctoral recipients who responded to this question. The median age of new doctoral recipients was 31 years, while the mean age was 33 years. The first and third quartiles were 29 and 35 years, respectively. In the previous six years the median age has generally been 30 and the mean age has been 32, with first and third quartiles at 28 and 34 years, respectively.

Previous Annual Survey Reports

The 2004 First Annual Survey Report was published in the *Notices* in the February 2005 issue. For the last full year of reports, the 2003 First, Second, and Third Annual Survey Reports were published in the *Notices* in the February, August, and September 2004 issues respectively. These reports and earlier reports, as well as a wealth of other information from these surveys, are available on the AMS website at www.ams.org/employment/surveyreports.html.

Starting Salary Survey of the 2003–2004 U.S. Doctoral Recipients

The starting salary figures for 2004 were compiled from information gathered on the EENDR questionnaires sent to individuals who received doctoral degrees in the mathematical sciences during the 2003–2004 academic year from universities in the United States (see previous section for more details).

The questionnaires were distributed to 914 recipients of degrees using addresses provided by the departments granting the degrees; 525 individuals responded between late October and April. Responses with insufficient data or from individuals who indicated they had part-time or non-U.S. employment were excluded. Numbers of usable responses for each salary category are reported in the following tables.

Readers should be warned that the data in this report are obtained from a self-selected sample, and inferences from them may not be representative of the population.

Key to Tables and Graphs. Salaries are listed in hundreds of dollars. Nine-month salaries are based on 9–10 months' teaching and/or research, not adding extra stipends for summer grants or summer teaching or the equivalent. Years listed denote the survey cycle in which the doctorate was received: for example: survey cycle July 1, 2003–June 30, 2004, is designated as 2004. Salaries are those reported for the fall immediately following the survey cycle. M and F are male and female respectively. Some persons receiving a doctoral degree had been employed in their present position for several years, so those who had “one year or less experience” were analyzed separately from the total. Male and female figures are not provided when the number of salaries available for analysis in a particular category was five or fewer. Also, quartile figures are not available for 1970 through 1980. All categories of “Teaching/Teaching and Research” and “Research Only” contain those recipients employed at academic institutions only. The “Academic Research Only, 9–10-Month Salaries” category was dropped from the published analyses in 1998 because so few recipients responded in this category that the data were not considered meaningful. Starting salaries for those reporting a 9–10-month salary postdoctoral position are available for an eighth year. These salaries are also included within the “Academic Teaching/Teaching and Research, 9–10-Month Salaries” table and boxplot on page 753.

Graphs. The graphs show standard boxplots summarizing salary distribution information for the years 1997 through 2004. Values plotted for 1997 through 2003 are converted to 2004 dollars using the implicit price deflator prepared annually by the Bureau of Economic Analysis, U.S. Department of Commerce.

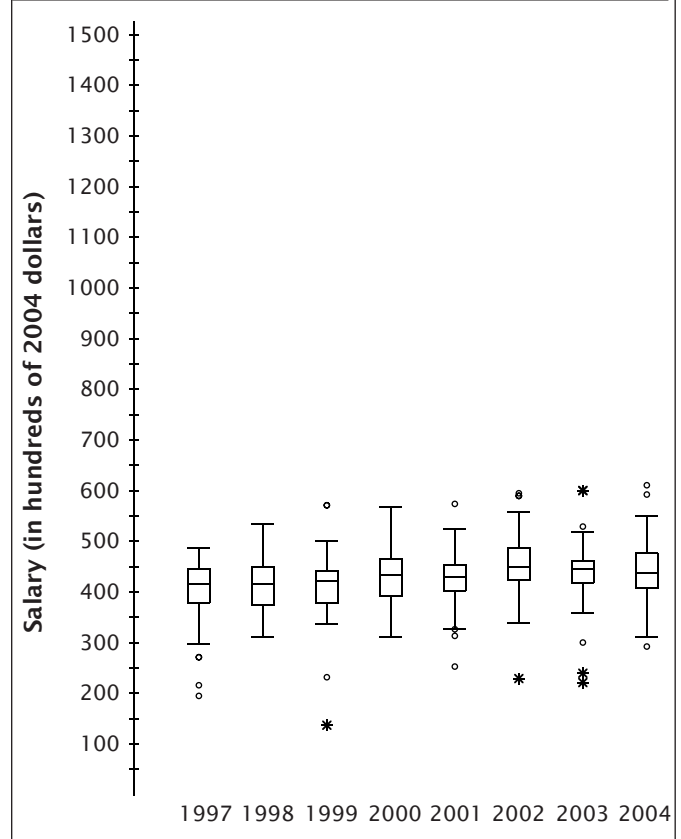
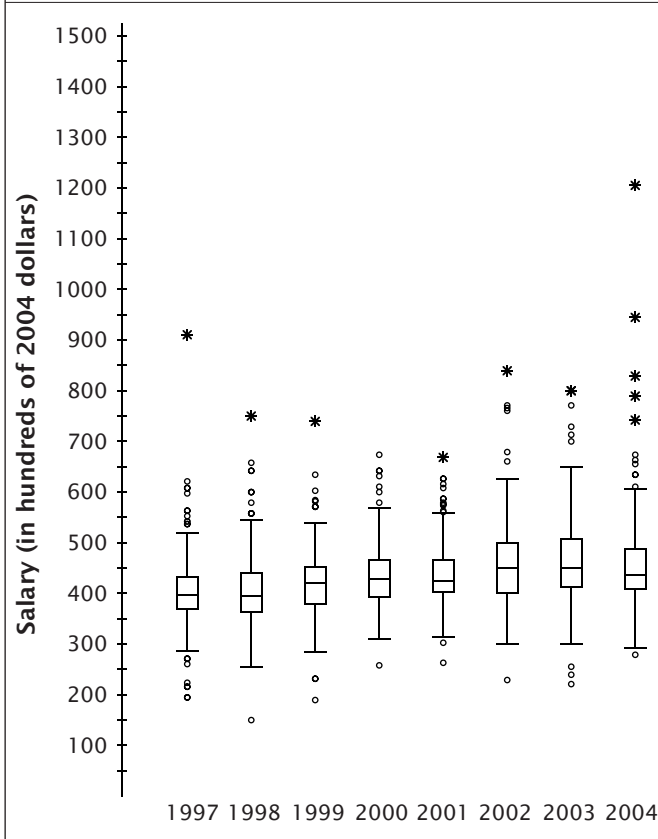
For each boxplot the box shows the first quartile (Q1), the median (M), and the third quartile (Q3). The interquartile range (IQR) is defined as $Q3 - Q1$. Think of constructing invisible fences $1.5 \times \text{IQR}$ below Q1 and $1.5 \times \text{IQR}$ above Q3. Whiskers are drawn from Q3 to the largest observation that falls below the upper invisible fence and from Q1 to the smallest observation that falls above the lower invisible fence. Think of constructing two more invisible fences, each falling $1.5 \times \text{IQR}$ above or below the existing invisible fences. Any observation that falls between the fences on each end of the boxplots is called an outlier and is plotted as \circ in the boxplots. Any observation that falls outside of both fences either above or below the box in the boxplot is called an extreme outlier and is marked as $*$ in the boxplot.

**Academic Teaching/Teaching and Research
9-10-Month Salaries
(in hundreds of dollars)**

**Academic Postdoctorates
9-10-Month Salaries
(in hundreds of dollars)**

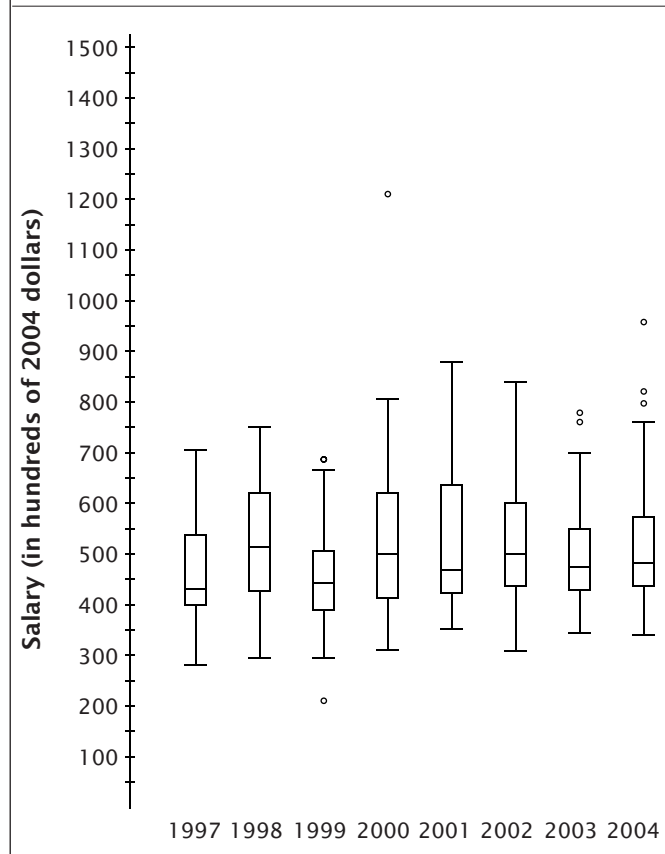
Ph.D. Year	Min	Q ₁	Median	Q ₃	Max	Reported Median in 2004 \$
1975	90	120	128	135	173	365
1980	105	155	171	185	250	343
1985	170	230	250	270	380	388
1990	230	305	320	350	710	425
1995	220	320	350	382	640	411
1996	240	333	360	400	636	415
1997	180	340	366	400	840	415
1998	140	340	370	410	700	415
1999	180	360	400	430	700	442
2000	250	380	415	450	650	449
2001	259	400	420	461	660	444
2002	230	400	450	500	840	468
2003	220	415	450	510	920	460
2004	285	420	450	500	1234	450
2000 M	250	380	415	450	650	
2000 F	321	380	413	450	620	
2001 M	259	490	430	475	660	
2001 F	310	390	413	443	620	
2002 M	230	420	450	500	840	
2002 F	300	400	441	498	610	
2003 M	220	420	450	509	855	
2003 F	359	414	444	512	920	
Total (146 male/78 female)						
2004 M	285	420	450	490	850	
2004 F	300	421	450	500	1234	
One year or less experience (123 male/58 female)						
2004 M	300	420	450	490	850	
2004 F	300	420	450	490	1234	

Ph.D. Year	Min	Q ₁	Median	Q ₃	Max	Reported Median in 2004 \$
1997	180	350	385	410	450	437
1998	290	350	390	420	500	438
1999	130	365	400	418	540	442
2000	300	385	420	450	550	455
2001	250	400	425	450	566	449
2002	230	425	450	487	595	468
2003	240	420	450	480	600	460
2004	300	420	450	490	625	450
2000 M	300	390	420	450	550	
2000 F	360	389	448	458	544	
2001 M	250	400	430	454	566	
2001 F	310	395	421	438	490	
2002 M	230	425	450	488	595	
2002 F	380	430	450	485	589	
2002 M	230	425	450	488	595	
2002 F	380	430	450	485	589	
2003 M	220	420	450	509	855	
2003 F	359	414	444	512	920	
Total (55 male/20 female)						
2004 M	300	420	450	480	625	
2004 F	400	440	470	500	606	



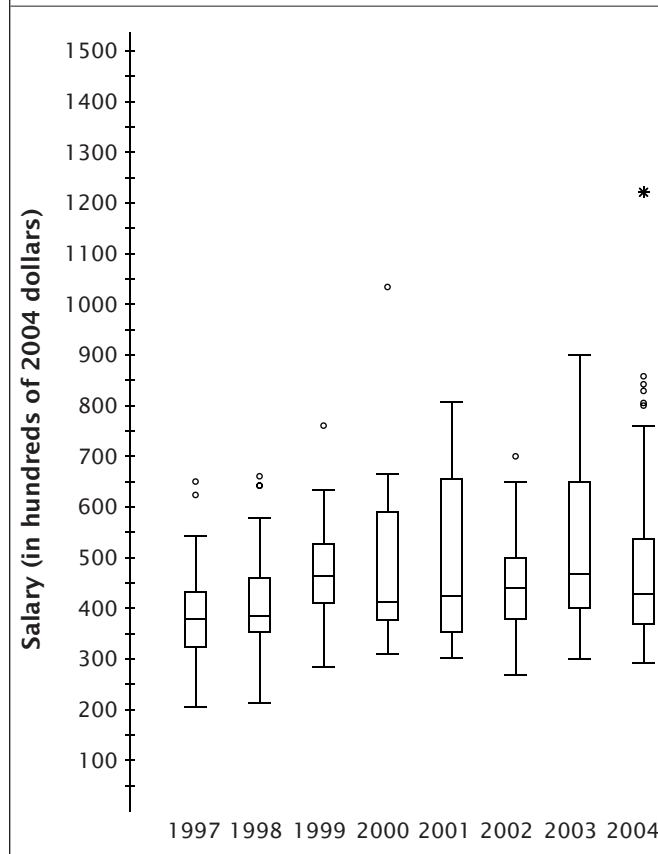
**Academic Teaching/Teaching and Research
11-12-Month Salaries
(in hundreds of dollars)**

Ph.D. Year	Min	Q ₁	Median	Q ₃	Max	Reported Median in 2004 \$
1975	87	---	145	---	204	413
1980	143	---	195	---	350	391
1985	220	230	273	300	470	424
1990	225	318	365	404	670	484
1995	300	354	410	478	600	482
1996	150	302	340	390	720	392
1997	260	370	400	497	650	454
1998	275	405	480	575	700	539
1999	200	374	420	469	650	465
2000	300	400	485	600	1170	525
2001	350	420	465	615	870	492
2002	310	439	500	597	840	520
2003	345	438	475	550	780	485
2004	350	450	495	583	980	495
2000 M	300	390	460	650	1170	
2000 F	395	465	500	570	750	
2001 M	350	420	443	498	870	
2001 F	380	465	588	658	750	
2002 M	310	420	485	595	840	
2002 F	400	453	500	558	700	
2003 M	397	440	490	555	780	
2003 F	345	400	440	513	620	
Total (32 male/8 female)						
2004 M	350	448	487	533	980	
2004 F	380	465	545	605	650	
One year or less experience (28 male/8 female)						
2004 M	350	440	483	520	980	
2004 F	380	465	545	605	650	



**Academic Research Only
11-12-Month Salaries
(in hundreds of dollars)**

Ph.D. Year	Min	Q ₁	Median	Q ₃	Max	Reported Median in 2004 \$
1975	90	---	119	---	180	339
1980	120	---	180	---	321	361
1985	190	295	342	400	520	531
1990	180	280	300	365	546	398
1995	196	280	340	370	587	400
1996	192	270	330	400	585	381
1997	190	300	350	400	600	397
1998	200	333	360	428	617	404
1999	270	390	440	500	720	487
2000	300	384	400	555	1000	433
2001	300	367	420	625	800	444
2002	270	380	440	500	700	457
2003	300	415	470	613	900	480
2004	300	384	440	543	1250	440
2000 M	300	390	400	486	1000	
2000 F	300	360	410	580	630	
2001 M	300	348	425	655	800	
2001 F	342	400	420	588	700	
2002 M	270	388	440	500	650	
2002 F	310	350	440	505	700	
2003 M	300	420	450	510	820	
2003 F	310	390	480	650	900	
Total (37 male/19 female)						
2004 M	300	385	440	660	1250	
2004 F	350	383	440	495	820	
One year or less experience (31 male/16 female)						
2004 M	300	368	440	560	863	
2004 F	350	378	410	452	780	

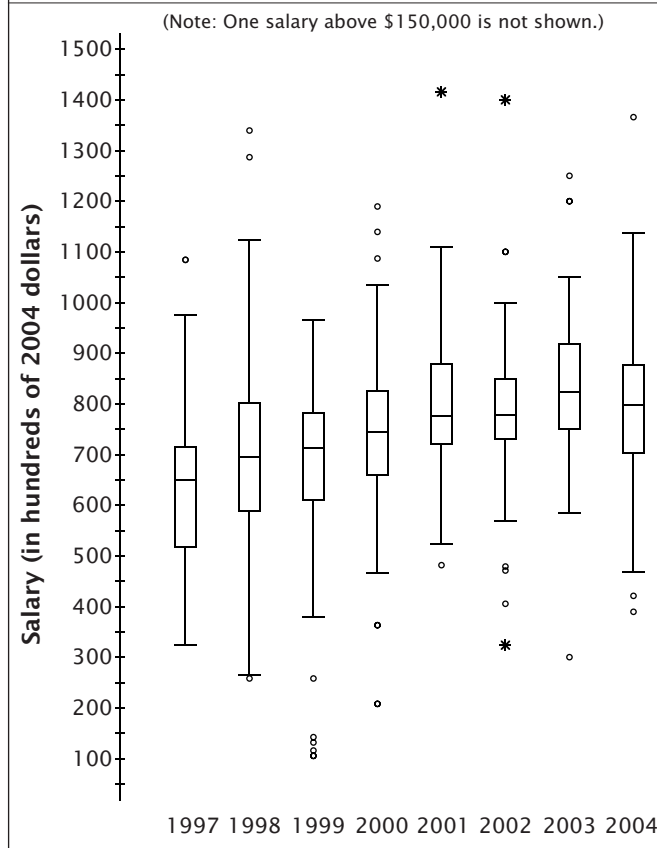
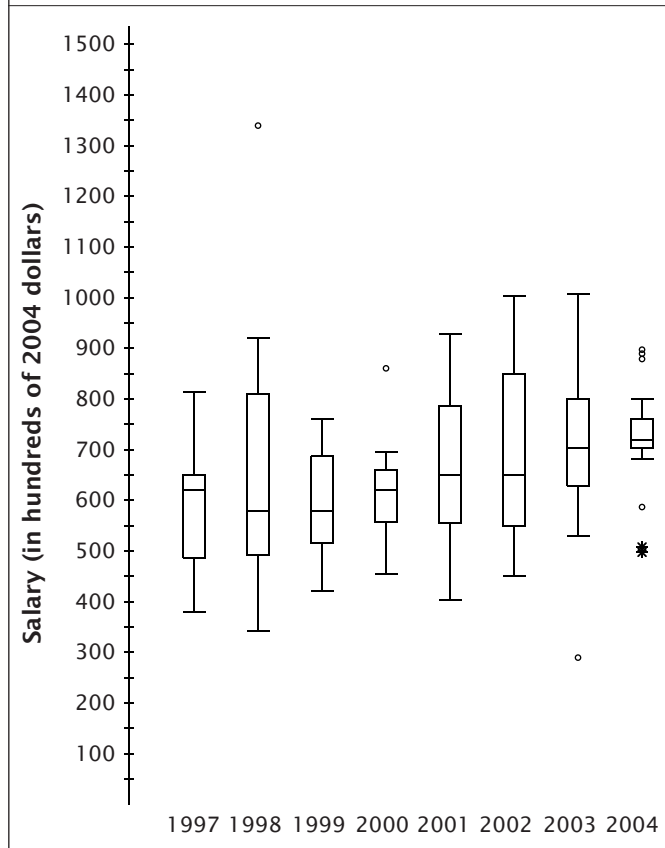


**Government
11-12-Month Salaries
(in hundreds of dollars)**

Ph.D. Year	Min	Q ₁	Median	Q ₃	Max	Reported Median in 2004 \$
1975	78	---	182	---	247	518
1980	156	---	244	---	501	489
1985	263	294	325	381	440	505
1990	320	345	378	430	587	501
1995	370	440	494	507	650	581
1996	360	420	427	504	650	492
1997	350	454	573	600	750	650
1998	320	475	540	736	1250	606
1999	400	495	550	651	720	608
2000	440	540	600	640	830	649
2001	400	580	644	758	920	681
2002	450	551	650	775	1005	676
2003	290	668	705	763	1008	720
2004	510	720	738	780	920	738
2000 M	440	563	620	649	830	
2000 F	530	545	566	593	650	
2001 M	400	590	647	780	920	
2001 F	450	550	630	670	896	
2002 M	450	551	642	725	1005	
2002 F	540	600	700	850	880	
2003 M	290	648	710	788	830	
2003 F	600	683	695	723	1008	
Total (9 male/8 female)						
2004 M	520	700	730	740	910	
2004 F	510	733	749	790	920	
One year or less experience (8 male/5 female)						
2004 M	520	675	732	780	910	
2004 F	510	720	738	743	820	

**Business and Industry
11-12-Month Salaries
(in hundreds of dollars)**

Ph.D. Year	Min	Q ₁	Median	Q ₃	Max	Reported Median in 2004 \$
1975	114	---	187	---	240	533
1980	190	---	284	---	400	569
1985	260	360	400	420	493	621
1990	320	438	495	533	700	657
1995	288	480	568	690	1250	667
1996	250	510	580	610	1000	669
1997	300	483	600	658	1000	681
1998	240	550	650	750	2250	729
1999	360	600	680	761	2450	752
2000	200	640	720	800	1500	779
2001	475	716	770	865	1850	814
2002	325	734	780	850	1400	811
2003	300	700	800	900	1250	817
2004	400	728	817	900	1800	817
2000 M	200	640	730	800	1500	
2000 F	200	645	690	788	980	
2001 M	520	717	788	875	1700	
2001 F	475	710	750	850	1850	
2002 M	325	738	782	858	1100	
2002 F	600	713	768	838	1400	
2003 M	550	725	840	920	1250	
2003 F	300	628	780	816	900	
Total (33 male/11 female)						
2004 M	400	710	813	900	1800	
2004 F	480	789	850	900	1100	
One year or less experience (21 male/9 female)						
2004 M	500	680	800	850	1000	
2004 F	400	615	800	900	1100	



Definitions of the Groups

As has been the case for a number of years, much of the data in these reports is presented for departments divided into groups according to several characteristics, the principal one being the highest degree offered in the mathematical sciences. Doctoral-granting departments of mathematics are further subdivided according to their ranking of "scholarly quality of program faculty" as reported in the 1995 publication *Research-Doctorate Programs in the United States: Continuity and Change*.¹ These rankings update those reported in a previous study published in 1982.² Consequently, the departments which now comprise Groups I, II, and III differ significantly from those used prior to the 1996 survey.

The subdivision of the Group I institutions into Group I Public and Group I Private was new for the 1996 survey. With the increase in number of the Group I departments from 39 to 48, the Data Committee judged that a further subdivision of public and private would provide more meaningful reporting of the data for these departments.

Brief descriptions of the groupings are as follows:

Group I is composed of 48 doctoral-granting departments with scores in the 3.00–5.00 range. Group I Public and Group I Private are Group I doctoral-granting departments at public institutions and private institutions respectively.

Group II is composed of 56 doctoral-granting departments with scores in the 2.00–2.99 range.

Group III contains the remaining U.S. doctoral-granting departments, including a number of departments not included in the 1995 ranking of program faculty.

Group IV contains U.S. doctoral-granting departments (or programs) of statistics, biostatistics, and biometrics reporting a doctoral program.

Group V contains U.S. doctoral-granting departments (or programs) of applied mathematics/applied science, operations research, and management science.

Group Va is applied mathematics/applied science doctoral-granting departments; Group Vb, which is no longer surveyed as of 1998–99, was operations research and management science.

Group M or Master's contains U.S. departments granting a master's degree as the highest graduate degree.

Group B or Bachelor's contains U.S. departments granting a baccalaureate degree only.

Listings of the actual departments which comprise these groups are available on the AMS website at www.ams.org/outreach.

¹Research-Doctorate Programs in the United States: Continuity and Change, edited by Marvin L. Goldberger, Brendan A. Maher, and Pamela Ebert Flat-tau, National Academy Press, Washington, DC, 1995.

²These findings were published in An Assessment of Research-Doctorate Programs in the United States: Mathematical and Physical Sciences, edited by Lyle V. Jones, Gardner Lindzey, and Porter E. Coggeshall, National Academy Press, Washington, DC, 1982. The information on mathematics, statistics, and computer science was presented in digest form in the April 1983 issue of the Notices, pages 257–67, and an analysis of the classifications was given in the June 1983 Notices, pages 392–3.

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 Annual Survey 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.

Other Data Sources

American Association of University Professors, *Inequities Persist for Women and Non-Tenure-Track Faculty: The Annual Report on the Economic Status of the Profession 2004–2005*, Academe: Bull. AAUP (March/April 2005), Washington, DC.

American Statistical Association, *2004–2005 Salary Report of Academic Statisticians*, AmStat News (December 2004), Alexandria, VA.

—, *Salary Survey Results: Biostatistics and Other Biomedical Statistics Departments and Units*, AmStat News (December 2004), Alexandria, VA.

Commission on Professionals in Science and Technology, *Professional Women and Minorities*, 15th ed., CPST, Washington, DC, 2004.

—, *Salaries of Scientists, Engineers, and Technicians: A Summary of Salary Surveys*, 20th ed., CPST, Washington, DC, 2003.

Conference Board of the Mathematical Sciences, *Statistical Abstract of Undergraduate Programs in the Mathematical Sciences in the United States: Fall 2000 CBMS Survey*, American Mathematical Society, 2002.

—, *Statistical Abstract of Undergraduate Programs in the Mathematical Sciences in the United States: Fall 1995 CBMS Survey*, MAA Reports No. 2, 1997.

National Opinion Research Center, *Doctorate Recipients from United States Universities: Summary Report 2002*, Survey of Earned Doctorates, Chicago, IL, 2003.

National Research Council, *Strengthening the Linkages between the Sciences and the Mathematical Sciences*, National Academy Press, Washington, DC, 2000.

—, *U.S. Research Institutes in the Mathematical Sciences: Assessment and Perspectives*, National Academy Press, Washington, DC, 1999.

—, *Research-Doctorate Programs in the United States: Continuity and Change*, National Academy Press, Washington, DC, 1995.

National Science Board, *Science and Engineering Indicators—2004*. Two Volumes (Volume 1, NSB 04-01; Volume 2, NSB 04-1A), National Science Foundation, Arlington, VA, 2004.

National Science Foundation, *Characteristics of Doctoral Scientists and Engineers in the United States: 2001* (NSF 03-310), Detailed Statistical Tables, Arlington, VA, 2003.

——, *Graduate Students and Postdoctorates in Science and Engineering: Fall 2002* (NSF 05-310), Arlington, VA, 2005.

——, *Science and Engineering Degrees: 1966-2001* (NSF 04-311), Detailed Statistical Tables, Arlington, VA, 2004.

——, *Science and Engineering Degrees, by Race/Ethnicity of Recipients: 1992-2001* (NSF 04-318), Detailed Statistical Tables, Arlington, VA, 2004.

——, *Science and Engineering Doctorate Awards: 2002* (NSF 04-303), Detailed Statistical Tables, Arlington, VA, 2003.

——, *Statistical Profiles of Foreign Doctoral Recipients in Science and Engineering: Plans to Stay in the United States* (NSF 99-304), Arlington, VA, 1998.

——, *Women, Minorities, and Persons with Disabilities in Science and Engineering: 2004* (NSF 04-417), Arlington, VA, 2004

Doctoral Degrees Conferred 2003-2004

Supplementary List

The following list supplements the list of thesis titles published in the February 2005 *Notices*, pages 264-82.

ALABAMA

Auburn University (4)

MATHEMATICS AND STATISTICS

Granado, Michael, On the moving off property and weak additivity of local connectedness and metrizable.

Holliday, John, The Shields-Harary number graphs.

Logan, Sasha, Maximal sets of Hamilton cycles.

Muse, William, Orthogonal quadruple systems and 3-frames.

CALIFORNIA

University of California, Irvine (4)

MATHEMATICS

Boutchaktchiev, Vilislav, Mixed Hodge structure on Brill-Noether stacks.

Gurtas, Yusuf, Positive Dehn twist expressions for some elements of finite order in the mapping class group.

Tsai, Yen-Lung, Non-abelian Clemens-Schmid exact sequences.

Yun, Myung Sik, Numerical simulation of microstructural evolution of inhomogeneous elastic media.

University of California, San Diego

(10)

MATHEMATICS

Chang, Frank, Division algebras over generalized local fields.

Kroyan, Julia, Trust-search algorithms for unconstrained optimization.

Lu, Shaoying, Scalable parallel multilevel algorithms for solving partial differential equations.

McMurry, Timothy Lewis, Infinite order flat-top kernels in nonparametric regression.

Melcher, Tai, Hypocoelliptic heat kernel inequalities on Lie groups.

Mendes, Anthony A., Building generating functions brick by brick.

Ovall, Jeffrey Scott, Duality-based adaptive refinement for elliptic PDEs.

Parker, Cameron, Block bootstrap methods for unit root testing.

Sanchez, Rino, A construction of small unitary representations.

Schuman, Michele Ann, A new look at problems of Herstein and Kaplansky.

FLORIDA

University of Florida (1)

STATISTICS

Kim, Myung Joon, Constrained Bayes and empirical Bayes estimators under squared error and balanced loss functions.

KENTUCKY

University of Kentucky (4)

STATISTICS

Berhane, Indrias, Consistency and generalization error bound of feed forward neural network trained with smoothing regularizer.

Kim, Kyoungmi, Empirical likelihood ratio method when additional information is known.

Peng, Xuejun, Simultaneous inference and sample size considerations for microarray data analysis.

Smith, Michelle, Markov chain analysis and statistical inference for start-up demonstration test.

NEW JERSEY

Rutgers University, Graduate School (4)

STATISTICS

Eyheramendy, Susana, Bayesian text categorization.

Liu, Jun, Stochastic control problems with limitations on the set of allowable controls.

Thompson, Wesley, Transformation and selection of covariates estimating equations.

Zhang, Jingshan, Scalar scale analysis of multivariate data-robust testing based on scale curves.

PENNSYLVANIA

Temple University (5)

STATISTICS

Allen, Shannon Eileen, Analysis of hierarchical factorial layouts when observations are sampled from unbalanced finite populations of finite effects.

Chin, Jie, Bayesian approaches to simultaneous testing of multiple hypotheses.

Gagnon, Robert Charles, Experiments with unknown parameters in variance.

Li, Susan Xuemei, Further contributions to Fisher's and Sims' tests.

Pasles, Elise B., Mutually nearly orthogonal Latin squares and their applications.

University of Pittsburgh (8)

BIOSTATISTICS

Kelly, Mary E., Zero inflation in ordinal data: applications of a mixture model.

McHenry, Michael Brent, New estimation approaches in survival analysis with Aalen's additive risk model.

Ruppert, Kristine, Assessment of the use of biopsies collected as part of nonsystematic follow-up of liver transplant patients.

Shen, Changyu, Regression analysis in longitudinal studies with nonignorable missing outcomes.

Szatkiewicz, Jin Peng, Mapping genes for quantitative traits using selected samples of sibling pairs.

Wang, Jiping, Use of receiver operating characteristic curve in medical decision making.

Xu, Lei, Covariate adjustment partial least squares for the extraction of the spatial temporal pattern.

Ye, Yunrong, The correlated random parameters model for longitudinal binary response data with missing covariates.