

2003 Annual Survey of the Mathematical Sciences

(Second Report)

Updated Report on the 2002–2003 U.S. Doctoral Recipients
Starting Salary Survey of the 2002–2003 U.S. Doctoral Recipients

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

Update on the 2002–2003 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 800 of this report.

This Second Report includes data from two parts of the 2003 Annual Survey. First, we update information about new doctoral recipients reported earlier in the February 2004 issue. Second, we present the starting salaries of the new doctoral recipients who responded to a follow-up survey.

The names of the 2002–2003 doctoral recipients and their thesis titles were published in “Doctoral Degrees Conferred” (*Notices of the AMS*, February 2004, pages 246–63). This list has been supplemented by twenty additional new doctorates. The supplemental listing appears at the end of this report on page 801.

Information about recipients of doctoral degrees awarded between July 1, 2002, and June 30, 2003, was collected from doctorate-granting departments beginning in late spring 2003 and from a follow-up census of individual degree recipients beginning in October. The “2003 Annual Survey First Report” (*Notices of the AMS*, February 2004, pages 218–33) presented survey results obtained about new doctoral recipients from the departments. Here we update information for new doctoral recipients

This Second Report of the 2003 Annual Survey gives an update of the 2002–2003 new doctoral recipients from the First Report, which appeared in the *Notices of the AMS* in February 2004, pages 218–33. 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 2003 Annual Survey represents the forty-seventh in an annual series begun in 1957 by the American Mathematical Society. The 2003 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, Lorraine Denby, Alexander J. Hahn, Naresh Jain, G. Samuel Jordan, Stephen F. Kennedy, Ellen E. Kirkman (chair), David J. Lutzer, and James W. Maxwell (ex officio). The committee is assisted by AMS survey analyst Colleen A. Rose. Comments or suggestions regarding this Survey Report may be directed to the committee.

using data gathered with a questionnaire, Employment Experiences of New Doctoral Recipients (EENDR). The EENDR was sent in early October 2003 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.

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Highlights

- There were 1,037 doctoral recipients from U.S. institutions for 2002–2003, up 77 (8%) from the previous year. Last year’s number was the lowest since 1989–1990.
- The number of doctoral recipients who are U.S. citizens is 499, up 71 (12% increase) from last year’s number, which was the lowest figure reported since 1989–1990. The percentage of U.S. citizens among all doctoral recipients this year is 48%, up from 45% last year. The number of new doctoral recipients who are not U.S. citizens is 538, up 6 from last year’s number; this reverses a five-year trend of decline from 639 non-U.S. citizens in 1997–1998.
- Females totaled 308 (30%) of all new doctoral recipients, up in number (and down in percentage) from 296 (31%) last year. Of the 499 U.S. citizen new doctoral recipients, 158 are female (32%, up from 30% 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 much higher this year than it has been in recent years. This year’s report includes 193 new doctoral recipients of unknown employment status; last year this number was 94. This fact should be considered in interpreting comparisons in employment data from this year and previous years.
- The final unemployment rate for 2002–2003 doctoral recipients was 5.0%, the highest reported since 1996, when it was 8.1%.
- Of the 792 new doctoral recipients known to have employment in fall 2003, 682 (86%) new doctoral recipients found employment in the U.S.; last year this percentage was 88%.
- The number of new doctoral recipients taking positions in U.S. business and industry was 99 in fall 2003, a 27% decrease from last year’s number; this number has been decreasing the past four years from the 223 reported in fall 2000 (a 56% decrease). The percentage of doctoral recipients employed in the U.S. who were hired in business and industry in the U.S. is 19% in fall 2002–2003, down from 24% in 2001–2002 and from 30% in 2000–2001.
- The number of doctoral recipients taking U.S. academic positions has been decreasing each of the past 5 years, from 610 in 1999 to 551 in 2003.
- The number of new doctoral recipients hired by master’s and bachelor’s institutions was 158 this year. This number is a 7% increase in last year’s figure of 148. This is the first increase reported since 1998.
- There were 551 new doctoral recipients responding to the EENDR survey; of the 469 who found employment in the U.S., 54% reported obtaining a permanent position (last year this percentage was 52%).
- After showing a significant increase over the previous four years, there is a decline this year in the percentage of temporarily employed respondents who reported taking a postdoctoral position, from 83% in fall 2002 to 76% in fall 2003. The number of respondents who reported taking a postdoctoral position in fall 2003 was 164, down from 203 for fall 2002.

Updated Employment Status of 2002–2003 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 1993 through 2003. Final counts include those new doctoral recipients reported from departments who missed the deadline for inclusion in the First Report. Numbers in this table have been revised from reports prior to 1998–1999 to exclude new doctorates data from Group Vb departments, which are no longer surveyed. Reversing the downward trend of the past four years, this year the total number of new doc-

Table 1A: Annual U.S. Doctoral Recipients, Fall and Final Counts, 1993 to 2003

Year	Fall	Final
1993–1994	1025	1034
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

Table 1B: Citizenship of Annual U.S. Doctoral Recipients, 1998 to 2003

Year	U.S.	Non-U.S.	TOTAL
1998–1999	560	575	1135
1999–2000	566	561	1127
2000–2001	532	533	1065
2001–2002	428	532	960
2002–2003	499	538	1037

toral recipients is 1,037, up from the previous year by 77; last year’s number was the lowest since 1989–1990.

Table 1B shows trends in the number of new doctoral recipients for the past five years broken down

Table 1C: 2002–2003 U.S. Doctoral Recipients by Type of Degree-Granting Department

	I (Pu)	I (Pr)	II	III	IV	Va
Number	258	154	171	122	241	91
Percent	25	15	16	12	23	9

by U.S. citizens and non-U.S. citizens. There was a drop of 98 new doctoral recipients from 1998–1999 to 2002–2003, mostly explained by a drop of 61 U.S. citizen new doctoral recipients. This year the

**Table 2A: 2002–2003 U.S. Doctoral Recipients: Field of Thesis by
Fall 2003 Employment Status, Updated April 2004**

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)	29	8	13	4	5	0	5	6	1	12	0	1	84	
Group I (Private)	14	5	9	4	1	2	3	0	1	14	0	0	53	
Group II	7	3	9	3	2	2	9	3	4	10	2	0	54	
Group III	0	4	1	3	0	10	1	1	1	3	1	0	25	
Group IV	0	0	1	0	2	36	0	0	0	0	0	0	39	
Group Va	0	0	0	2	1	0	4	2	0	0	0	0	9	
Master's	8	9	8	3	3	6	4	2	0	2	3	2	50	
Bachelor's	30	11	16	8	1	7	6	7	4	13	5	0	108	
Two-Year College	0	0	0	0	0	0	1	1	0	1	0	0	3	
Other Academic Dept.	7	3	2	5	3	56	15	3	1	6	6	0	107	
Research Institute/ Other Nonprofit	3	0	0	3	0	11	0	2	0	0	0	0	19	
Government	6	0	1	2	2	11	3	4	0	3	0	0	32	
Business and Industry	9	6	2	8	4	50	11	5	3	1	0	0	99	
Non-U.S. Academic	22	5	10	8	0	14	6	14	2	15	1	0	97	
Non-U.S. Nonacademic	2	1	1	0	0	4	1	2	0	2	0	0	13	
Not Seeking Employment	1	1	0	0	0	5	0	2	0	1	0	0	10	
Still Seeking Employment	8	1	3	2	0	8	7	4	3	6	0	0	42	
Unknown (U.S.)	11	10	9	8	0	34	17	8	1	6	1	4	109	
Unknown (non-U.S.) ¹	12	8	9	6	5	19	14	6	0	4	1	0	84	
TOTAL	169	75	94	69	29	275	107	72	21	99	20	7	1037	
Column	Male	133	61	69	52	21	161	75	55	18	73	6	5	729
Subtotals	Female	36	14	25	17	8	114	32	17	3	26	14	2	308

¹ Includes those whose status is reported as "unknown" or "still seeking employment".

**Table 2B: 2002–2003 U.S. Doctoral Recipients: Type of Degree-Granting Department by
Fall 2003 Employment Status, Updated April 2004**

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)	44	25	9	2	0	4	84	64	20	
Group I (Private)	18	29	1	0	2	3	53	43	10	
Group II	17	5	24	3	2	3	54	40	14	
Group III	2	1	5	10	4	3	25	19	6	
Group IV	1	2	1	0	35	0	39	20	19	
Group Va	1	0	0	0	1	7	9	6	3	
Master's	8	2	19	15	6	0	50	27	23	
Bachelor's	20	11	45	19	7	6	108	73	35	
Two-Year College	0	0	3	0	0	0	3	1	2	
Other Academic Dept.	10	8	11	12	52	14	107	66	41	
Research Institute/ Other Nonprofit	2	7	0	0	10	0	19	9	10	
Government	5	2	8	2	8	7	32	19	13	
Business and Industry	19	14	5	8	46	7	99	75	24	
Non-U.S. Academic	33	21	11	14	13	5	97	76	21	
Non-U.S. Nonacademic	2	2	3	2	2	2	13	12	1	
Not Seeking Employment	2	0	2	2	4	0	10	7	3	
Still Seeking Employment	7	8	8	11	4	4	42	27	15	
Unknown (U.S.)	34	8	9	13	31	14	109	81	28	
Unknown (non-U.S.) ¹	33	9	7	9	14	12	84	64	20	
TOTAL	258	154	171	122	241	91	1037	729	308	
Column	Male	201	126	121	68	141	729			
Subtotals	Female	57	28	50	54	100	308			

¹ Includes those whose status is reported as "unknown" or "still seeking employment".

Table 2C: 2002–2003 U.S. Doctoral Recipients: Field of Thesis by Type of Degree-Granting Department, Updated April 2004

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)	72	33	41	21	11	4	16	15	5	38	1	1	258
Group I (Private)	43	12	25	15	5	7	19	8	1	17	0	2	154
Group II	39	17	23	10	5	6	21	18	7	22	2	1	171
Group III	13	13	4	11	2	17	11	19	1	14	17	0	122
Group IV	0	0	0	0	4	232	2	0	0	0	0	3	241
Group Va	2	0	1	12	2	9	38	12	7	8	0	0	91
TOTAL	169	75	94	69	29	275	107	72	21	99	20	7	1037

Table 2D: Percentage of Total Employed New Doctoral Recipients by Type of Employer, Fall 1999 to Fall 2003

%	U.S. Employed		Non-U.S. Employed		TOTAL NUMBER EMPLOYED
	Academic	Nonacademic	Academic	Nonacademic	
Fall 1999	64	23	11	2	955
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

number of new doctoral recipients who are U.S. citizens is 499, an increase of 71 over last year; last year's number of U.S. citizens was the lowest figure reported since 1989–1990. The all-time high

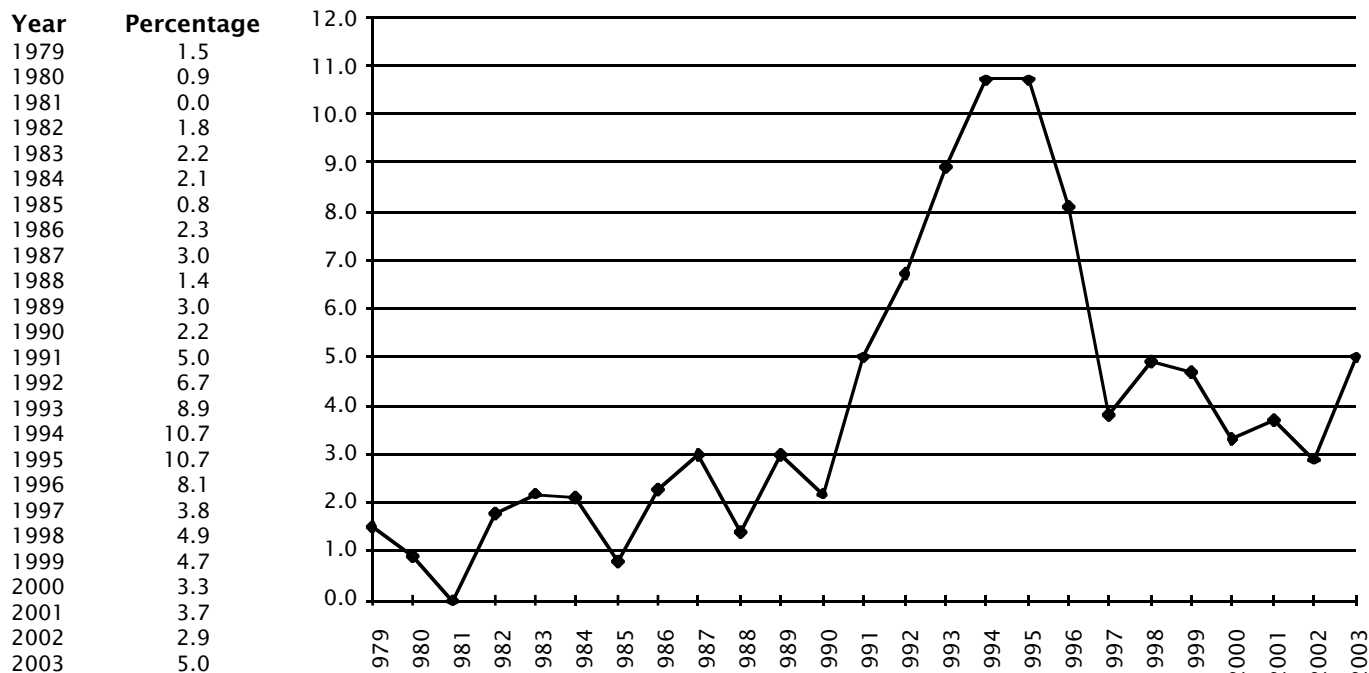
number of non-U.S. citizen new doctoral recipients was 679 in 1992–1993.

Table 1C gives a breakdown of the 1,037 doctoral degrees awarded in the mathematical sciences between July 1, 2002, and June 30, 2003, 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 2002–2003 doctoral recipients plus twenty additional doctoral recipients reported late. These tables are partitioned by field of thesis research, by the survey group of their degree department, and by type of employer. At the time of this Second Report, the fall 2003 employment status of 844 of the 1,037 doctoral recipients was known.

The fall 2003 unemployment rate for new doctoral recipients, based on information gathered by

Figure 1: Percentage of New Doctoral Recipients Unemployed, As Reported in the Respective Annual Survey Second Reports, 1979 to 2003



the time of the Second Report, was 5.0%. This is the highest unemployment rate since 1996, when it was 8.1%. Figure 1 presents the fall 1979 through fall 2003 trend in the final unemployment rate of new doctoral recipients. The counts on which these rates are determined do not include those new doctoral recipients whose fall employment status was unknown at the time of the Second Report. Although the number of recipients whose employment status was reported as unknown had been declining, from 150 in 1997 to a low of 94 in 2002, this year it spiked to a high of 193. For future reports, measures are being taken which should reduce the number of recipients whose employment status gets reported as unknown. Note that prior to 1999 the new doctoral recipients from Group Vb are included in the total unemployment rate for each year.

Of the 844 new doctoral recipients whose employment is known, 682 were employed in the U.S., 110 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 is at a five-year high, while the percentage of the total employed in U.S. nonacademic positions is at a five-year low.

Among new doctoral recipients who are employed, the percentage taking nonacademic employment (U.S. government, U.S. business and industry, and non-U.S. nonacademic) 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 11% (up from 9%), while the percentage

Table 3A: Number of New Doctoral Recipients Taking Positions in Business and Industry in the U.S. by Type of Degree-Granting Department, Fall 1999 to Fall 2003

Group	I (Pu)	I (Pr)	II	III	IV	Va	TOTAL
Fall 1999	32	24	28	21	66	14	185
Fall 2000	33	28	37	24	83	18	223
Fall 2001	28	15	27	26	75	23	194
Fall 2002	18	12	19	7	65	15	136
Fall 2003	19	14	5	8	46	7	99

for those with theses in probability or statistics is the highest, at 30% (down from 39%).

Tables 3A through 3D first appeared in the First Report for 2000–2001, although they do not have the same table numbers in that report. They have all been updated with information obtained from the in-

dividual new doctoral recipients who responded to the follow-up questionnaire. The next few paragraphs discuss some of the information presented in these tables.

Table 3B: Number of New Doctoral Recipients Taking U.S. Academic Positions by Type of Degree-Granting Department, Fall 1999 to Fall 2003

Group	I (Pu)	I (Pr)	II	III	IV	Va	TOTAL
Fall 1999	166	91	146	82	86	39	610
Fall 2000	144	82	126	79	131	28	590
Fall 2001	159	71	126	80	108	30	574
Fall 2002	133	86	107	91	102	34	553
Fall 2003	123	90	118	61	119	40	551

Table 3A shows that the fall 2003 total number of doctoral recipients taking positions in business or industry is 99; this number reflects a continued decline, and a 56% decrease since fall 2000's high of 223. While some groups have shown a slight increase, Groups II and IV show the largest decreases over last year.

Table 3C: Number of New Doctoral Recipients Taking U.S. Academic Positions by Type of Hiring Department, Fall 1999 to Fall 2003

Group	I–III	IV	Va	M&B	Other	TOTAL
Fall 1999	233	47	19	193	118	610
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

Table 3C shows that the number of new doctoral recipients taking U.S. academic positions has continued to decline over each of the past five years, from 610 in 1999 to 551 in 2003. The number hired by Groups M and B has dropped each of the years 1999–2002, but is slightly up this year; there has been a 18%

Table 3D: Females as a Percentage of 2002–2003 U.S. Doctoral Recipients Produced by and Hired by Doctoral-Granting Groups, Fall 2003

%	I (Pu)	I (Pr)	II	III	IV	Va	TOTAL
Produced	22	18	29	44	41	21	30
Hired	24	19	26	24	49	33	27

decrease from fall 1999 to fall 2003. This decline may reflect more hiring at these institutions of

Table 3E: 2002–2003 Male U.S. Doctoral Recipients: Type of Citizenship by Fall 2003 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	255	16	173	18	462
U.S. Academic	205	14	137	12	368
Groups I, II, III, and Va	92	4	68	8	172
Group IV	12	1	7	0	20
Non-Ph.D. Department	99	9	55	4	167
Research Institute/Other Nonprofit	2	0	7	0	9
U.S. Nonacademic	50	2	36	6	94
Non-U.S. Employer	11	0	75	2	88
Non-U.S. Academic	9	0	66	1	76
Non-U.S. Nonacademic	2	0	9	1	12
Not Seeking Employment	6	0	1	0	7
Still Seeking Employment	13	2	12	0	27
Subtotal	285	18	261	20	584
Unknown (U.S.)	55	6	18	2	81
Unknown (non-U.S.) ¹	1	0	50	13	64
TOTAL	341	24	329	35	729

¹ Includes those whose status is reported as "unknown" or "still seeking employment".

Table 3F: 2002–2003 Female U.S. Doctoral Recipients: Type of Citizenship by Fall 2003 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	130	16	66	8	220
U.S. Academic	107	12	57	7	183
Groups I, II, III, and Va	23	3	24	3	53
Group IV	10	1	7	1	19
Non-Ph.D. Department	68	7	24	2	101
Research Institute/Other Nonprofit	6	1	2	1	10
U.S. Nonacademic	23	4	9	1	37
Non-U.S. Employer	3	1	18	0	22
Non-U.S. Academic	3	1	17	0	21
Non-U.S. Nonacademic	0	0	1	0	1
Not Seeking Employment	2	0	1	0	3
Still Seeking Employment	9	4	2	0	15
Subtotal	144	21	87	8	260
Unknown (U.S.)	14	5	7	2	28
Unknown (non-U.S.) ¹	0	0	15	5	20
TOTAL	158	26	109	15	308

¹ Includes those whose status is reported as "unknown" or "still seeking employment".

individuals completing a postdoctoral appointment.

Table 3D gives information about the production and hiring of female new doctoral recipients in the doctoral-granting departments of this survey. From Table 3D we see that the percentage of females hired ranges from a high of 49% in Group IV to a low of 19% in Group I (private).

Updated Information about 2002–2003 U.S. Doctoral Recipients by Sex and Citizenship

Tables 3E and 3F show the sex and citizenship of the 1,037 new doctoral recipients and the fact that 682 new doctoral recipients found jobs in the U.S. this year. This is 86% of the 792 new

doctoral recipients known to have jobs in fall 2003. Last year this percentage was 88%.

Sex and citizenship is known for all of the 1,037 new doctoral recipients. The final count of new doctoral recipients who are U.S. citizens is 499 (48%). 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 224–6 of the First Report present further information related to the citizenship of the 2002–2003 new doctoral recipients.

Of the 499 U.S. citizen new doctoral recipients reported for 2002–2003, 158 are female and 341 are male. While females accounted for 32% of the

Table 3G: Number of 2002–2003 New 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	137	127	264
Academic, Other	175	112	287
Nonacademic	73	58	131
TOTAL	385	297	682

U.S. citizen total, both figures represent an increase over last year’s counts of 130 and 298, respectively.

Table 3G shows that U.S. academic doctoral departments, Groups I through Va, hired 52% U.S. citizens, while groups M, B, and all other academic departments hired 61% U.S. citizens. U.S. citizens represented 56% of those hired into nonacademic positions. Among the 682 new 2002–2003 doctoral recipients employed in the U.S., 19% took nonacademic employment (government or business and industry.) This percentage is down from 24% in 2001–2002 and from 30% in 2000–2001.

New Information from the EENDR Survey

Of the 1,017 new doctoral recipients reported in the First Report, the 910 whose addresses were known were sent the Employment Experiences of New Doctoral Recipients (EENDR) survey in October 2003, and 551 (54%) 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, 74%, was from those in academia in the U.S., while the lowest, 57%, was from those in 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 2002–2003 doctoral recipients.

Table 4A provides the trend in EENDR respondents taking permanent and temporary positions in the U.S for fall 1999 through fall 2003. This year we see that among the 469 employed in the U.S., 253 reported obtaining a permanent position and 216 a temporary position. Of the 216 in temporary positions,

Table 4A: Number (and Percentage) of Annual EENDR Respondents Taking U.S. Positions by Job Status, Fall 1999 to Fall 2003

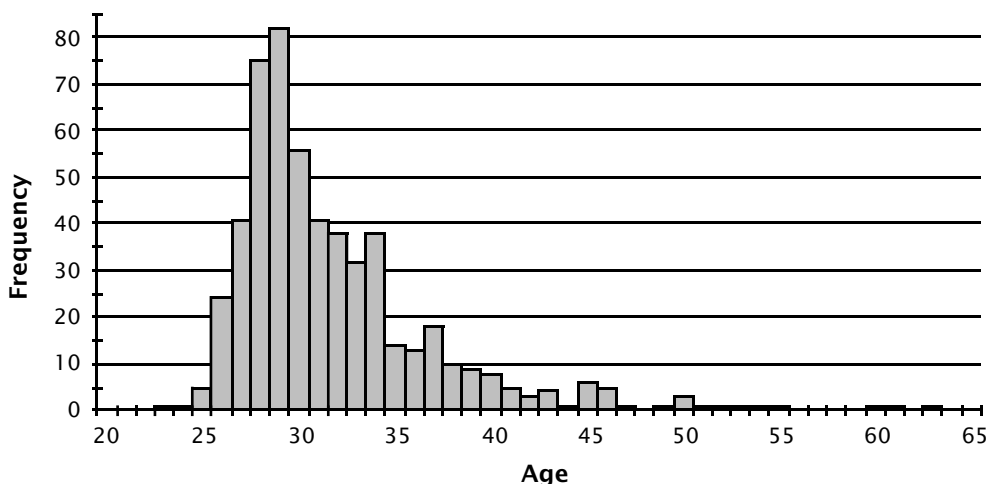
U.S. Employed	Fall 1999	Fall 2000	Fall 2001	Fall 2002	Fall 2003
TOTAL	512	536	473	510	469
Permanent	273 (53)	317 (59)	266 (56)	264 (52)	253 (54)
Temporary	237 (46)	218 (41)	205 (43)	245 (48)	216 (46)
Perm not avail.	101 (43)	92 (42)	107 (52)	90 (37)	87 (40)
Postdoctorate	155 (65)	157 (72)	143 (70)	203 (83)	164 (76)
Perm not avail.	58 (37)	55 (35)	42 (29)	69 (34)	53 (32)
Unknown	2	1	2	1	0

Table 4B: Percentage of Annual EENDR Respondents Taking U.S. Positions by Employment Sector within Job Status, Fall 1999 to Fall 2003

U.S. Employed	Fall 1999	Fall 2000	Fall 2001	Fall 2002	Fall 2003
Permanent					
Academia	59	59	62	70	76
Government	4	4	6	6	4
Business/Ind.	37	36	32	23	20
Temporary					
Academia	94	95	95	93	94
Government	5	2	4	6	3
Business/Ind.	0	2	0	1	3

87 (40%) reported taking temporary employment because a suitable permanent position was not available and 164 (76%) classified their position as postdoctoral. Furthermore, among those in postdoctoral positions, 32% responded that they took the position because a suitable permanent position was not available. Of particular note in Table 4A is that after showing a 13% increase last year, this year there is a decline in the percentage of temporarily employed respondents who reported

Figure 2: Age Distribution of 2002–2003 EENDR Respondents



taking a postdoctoral position; last year the percentage of temporarily employed respondents who were hired in postdoctoral positions was 83%, and this year it was 76%. The figures reported in this table for fall 2001 and fall 2002 have been corrected, as they were incorrectly reported on page 807 of the "2002 Annual Survey of the Mathematical Sciences Second Report" (*Notices of the AMS*, August 2003).

Table 4B shows the employment trends of permanent and temporary positions broken down by sector for the last five years. There has been a continuing increase in the proportion of EENDR respondents taking permanent employment in academia and an offsetting decline in the proportion taking permanent positions in business and industry.

Among the 253 who reported obtaining a permanent position in the U.S. in fall 2003, 76% were employed in academia (including 3% in research institutes and other nonprofits), 4% in government, and 20% in business or industry. Women held 37% of the permanent positions.

Among the 216 individuals with temporary employment in the U.S. this year, 94% were employed in academia (including 5% in research institutes and other nonprofits), 3% in government, and 3% in business or industry.

Figure 2 gives the age distribution of the 551 new doctoral recipients who responded to this question. The median age of new doctoral recipients was 30 years, while the mean age was 32 years. The first and third quartiles were 28 and 34 years, respectively. These figures are the same as those reported last year and very similar to those reported in previous years.

Previous Annual Survey Reports

The 2003 First Annual Survey Report was published in the *Notices of the AMS* in the February 2004 issue. For the last full year of reports, the 2002 First, Second, and Third Annual Survey Reports were published in the *Notices of the AMS* in the February, August, and September 2003 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 2002–2003 U.S. Doctoral Recipients

The starting salary figures for 2003 were compiled from information gathered on the EENDR questionnaires sent to individuals who received doctoral degrees in the mathematical sciences during the 2002–2003 academic year from universities in the United States (see previous section for more details).

The questionnaires were distributed to 910 recipients of degrees using addresses provided by the departments granting the degrees; 551 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.

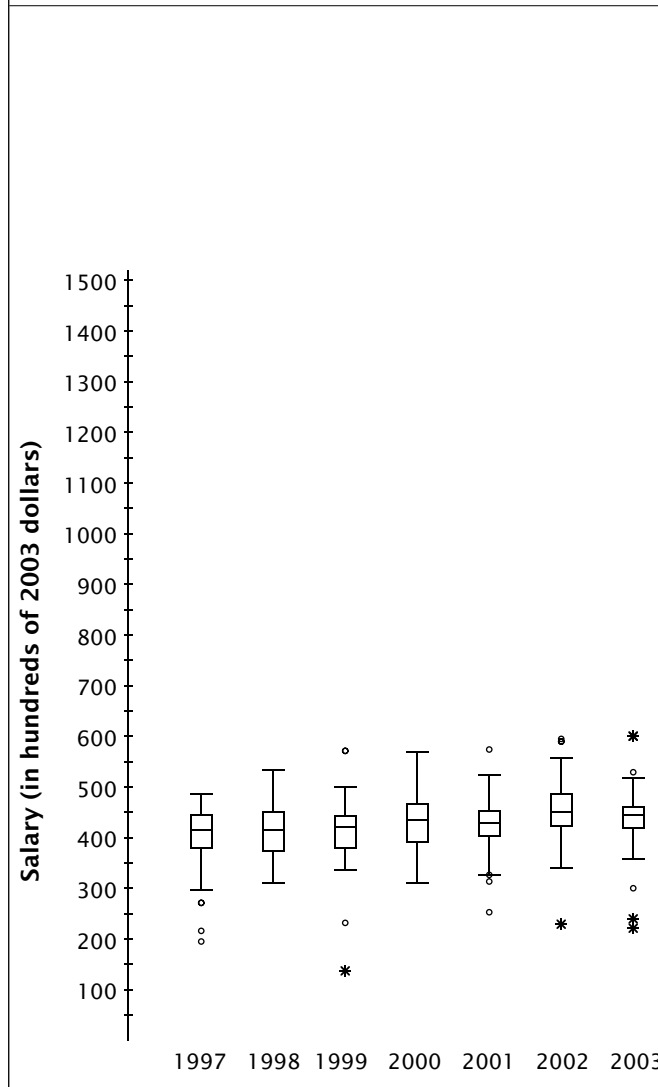
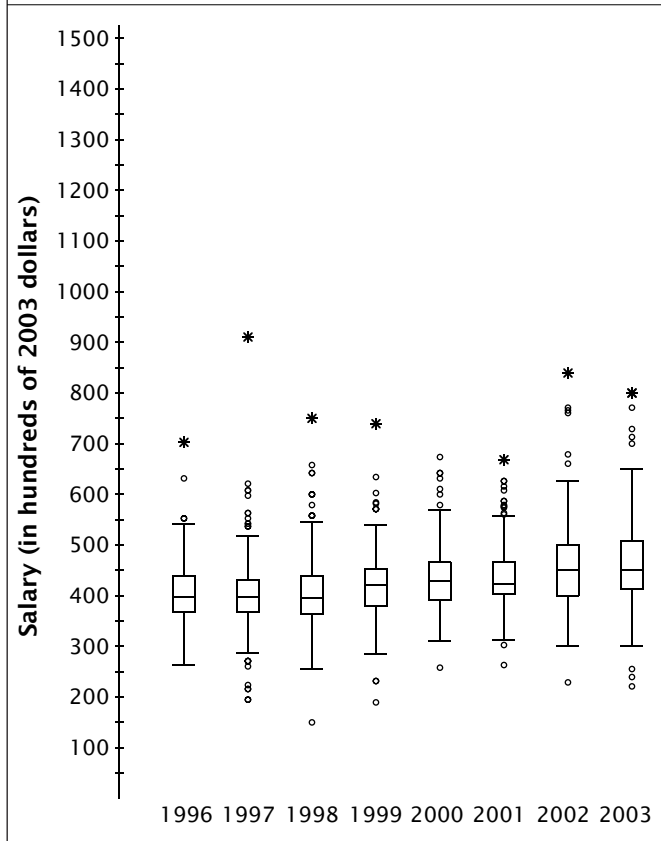
Key to Tables. Salaries are listed in hundreds of dollars. Nine-month salaries are based on 9–10 months' teaching and/or research, not adding extra stipends for summer grants or summer teaching or the equivalent. Years listed denote the survey cycle in which the doctorate was received. For example: survey cycle July 1, 2002–June 30, 2003 is designated as 2003. 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 respond 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 a sixth year. These salaries are also included within the "Academic Teaching/Teaching and Research, 9–10-Month Salaries" table and boxplot on page 797.

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

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

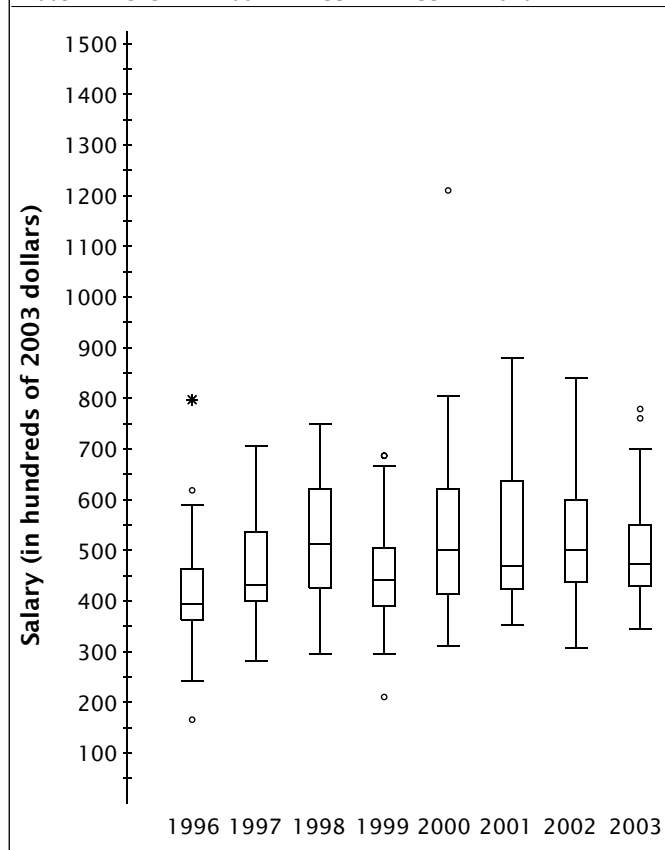
Ph.D. Year	Min	Q ₁	Median	Q ₃	Max	Reported Median in 2003 \$
1970	85	---	110	---	195	422
1975	90	120	128	135	173	356
1980	105	155	171	185	250	334
1985	170	230	250	270	380	379
1990	230	305	320	350	710	414
1995	220	320	350	382	640	402
1996	240	333	360	400	636	405
1997	180	340	366	400	840	405
1998	140	340	370	410	700	405
1999	180	360	400	430	700	432
2000	250	380	415	450	650	439
2001	259	400	420	461	660	434
2002	230	400	450	500	840	457
2003	220	415	450	510	920	450
1999 M	220	370	400	430	700	
1999 F	180	350	390	420	540	
2000 M	250	380	415	450	650	
2000 F	321	380	413	450	620	
2001 M	259	400	430	475	660	
2001 F	310	390	413	443	620	
2002 M	230	420	450	500	840	
2002 F	300	400	441	498	610	
Total (168 male/72 female)						
2003 M	220	420	450	509	855	
2003 F	359	414	444	512	920	
One year or less experience (143 male/54 female)						
2003 M	220	420	450	505	855	
2003 F	359	411	434	501	700	

Ph.D. Year	Min	Q ₁	Median	Q ₃	Max	Reported Median in 2003 \$
1997	180	350	385	410	450	399
1998	290	350	390	420	500	399
1999	130	365	400	418	540	404
2000	300	385	420	450	550	415
2001	250	400	425	450	566	410
2002	230	425	450	487	595	430
2003	240	420	450	480	600	450
1999 M	220	373	400	428	540	
1999 F	130	350	390	410	475	
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	
Total (67 male/16 female)						
2003 M	240	420	450	485	600	
2003 F	359	408	449	459	510	



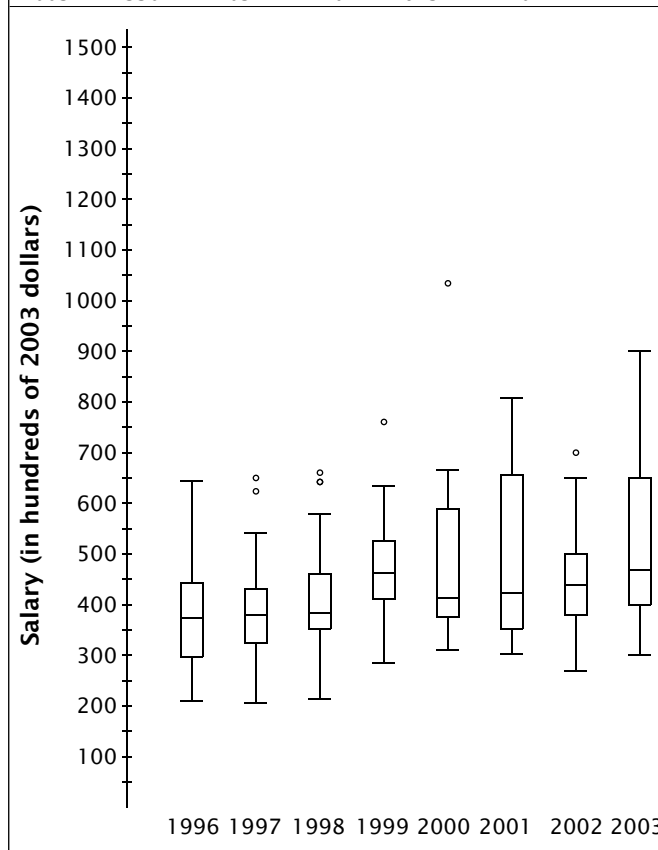
**Academic Teaching/Teaching and Research
11-12-Month Salaries
(in hundreds of dollars)**

Ph.D. Year	Min	Q ₁	Median	Q ₃	Max	Reported Median in 2003 \$
1970	95	---	128	---	200	491
1975	87	---	145	---	204	403
1980	143	---	195	---	350	381
1985	220	230	273	300	470	414
1990	225	318	365	404	670	473
1995	300	354	410	478	600	470
1996	150	302	340	390	720	383
1997	260	370	400	497	650	443
1998	275	405	480	575	700	526
1999	200	374	420	469	650	453
2000	300	400	485	600	1170	512
2001	350	420	465	615	870	480
2002	310	439	500	597	840	508
2003	345	438	475	550	780	475
1999 M	280	370	420	458	650	
1999 F	200	393	435	590	630	
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	
Total (28 male/12 female)						
2003 M	397	440	490	555	780	
2003 F	345	400	440	513	620	
One year or less experience (21 male/10 female)						
2003 M	397	440	470	520	700	
2003 F	345	400	433	455	620	



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

Ph.D. Year	Min	Q ₁	Median	Q ₃	Max	Reported Median in 2003 \$
1970	90	---	120	---	205	461
1975	90	---	119	---	180	331
1980	120	---	180	---	321	352
1985	190	295	342	400	520	518
1990	180	280	300	365	546	389
1995	196	280	340	370	587	390
1996	192	270	330	400	585	372
1997	190	300	350	400	600	388
1998	200	333	360	428	617	394
1999	270	390	440	500	720	475
2000	300	384	400	555	1000	423
2001	300	367	420	625	800	434
2002	270	380	440	500	700	447
2003	300	415	470	613	900	470
1999 M	270	383	400	493	600	
1999 F	340	468	530	581	720	
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	
Total (29 male/19 female)						
2003 M	300	420	450	510	820	
2003 F	310	390	480	650	900	
One year or less experience (24 male/16 female)						
2003 M	300	400	440	496	770	
2003 F	330	405	470	613	720	

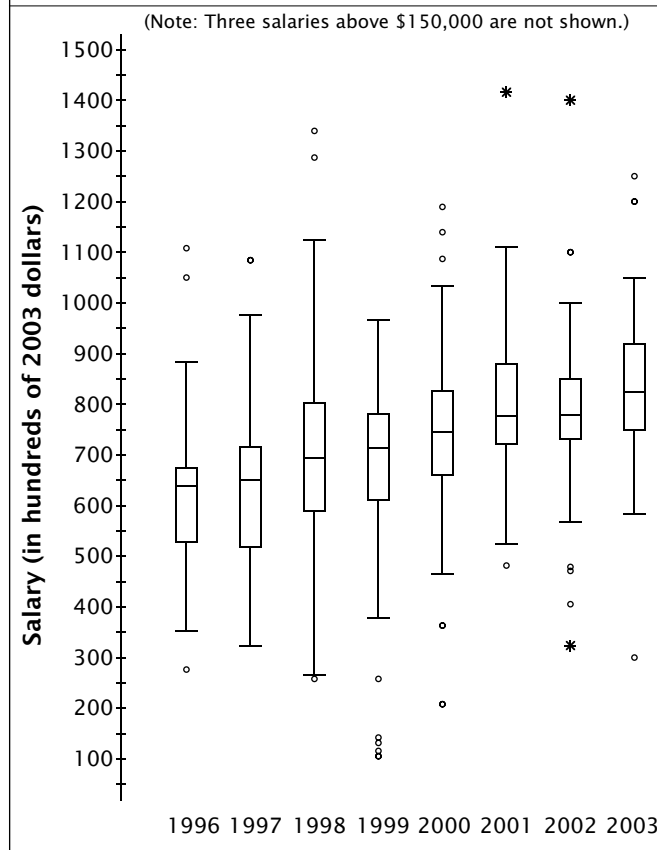
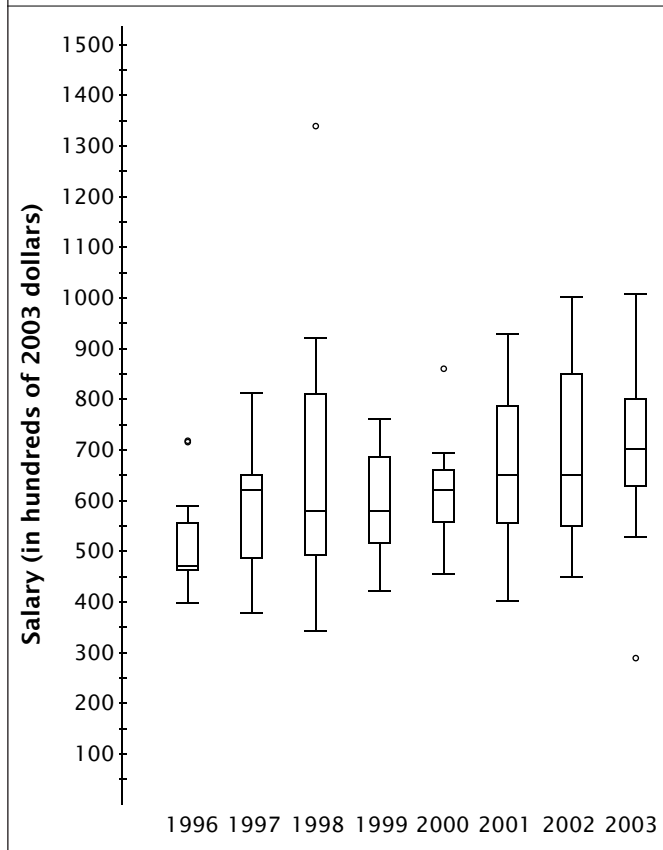


**Government
11-12-Month Salaries
(in hundreds of dollars)**

Ph.D. Year	Min	Q ₁	Median	Q ₃	Max	Reported Median in 2003 \$
1970	100	---	150	---	223	576
1975	78	---	182	---	247	506
1980	156	---	244	---	501	477
1985	263	294	325	381	440	493
1990	320	345	378	430	587	490
1995	370	440	494	507	650	567
1996	360	420	427	504	650	481
1997	350	454	573	600	750	635
1998	320	475	540	736	1250	591
1999	400	495	550	651	720	594
2000	440	540	600	640	830	634
2001	400	580	644	758	920	665
2002	450	551	650	775	1005	661
2003	290	668	705	763	1008	705
1999 M	400	495	540	587	720	
1999 F	---	---	---	---	---	
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	
Total (10 male/6 female)						
2003 M	290	648	710	788	830	
2003 F	600	683	695	723	1008	
One year or less experience (9 male/5 female)						
2003 M	290	630	710	750	830	
2003 F	600	680	690	700	730	

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

Ph.D. Year	Min	Q ₁	Median	Q ₃	Max	Reported Median in 2003 \$
1970	96	---	170	---	235	653
1975	114	---	187	---	240	520
1980	190	---	284	---	400	555
1985	260	360	400	420	493	606
1990	320	438	495	533	700	641
1995	288	480	568	690	1250	652
1996	250	510	580	610	1000	653
1997	300	483	600	658	1000	665
1998	240	550	650	750	2250	712
1999	360	600	680	761	2450	734
2000	200	640	720	800	1500	761
2001	475	716	770	865	1850	795
2002	325	734	780	850	1400	793
2003	300	700	800	900	1250	800
1999 M	360	626	700	763	2450	
1999 F	440	580	644	676	1100	
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	
Total (32 male/15 female)						
2003 M	550	725	840	920	1250	
2003 F	300	628	780	816	900	
One year or less experience (24 male/11 female)						
2003 M	550	719	815	905	1250	
2003 F	300	610	702	805	880	



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 departments with scores in the 3.00–5.00 range. Group I Public and Group I Private are Group I departments at public institutions and private institutions respectively.

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

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

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

Group V contains U.S. departments (or programs) in applied mathematics/applied science, operations research, and management science which report a doctoral program.

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

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

Group B 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 Flattau, 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.

Graphs. The graphs show standard boxplots summarizing salary distribution information for the years 1996 through 2003. Values plotted for 1996 through 2002 are converted to 2003 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 $1.5 \times IQR$ below Q1 and $1.5 \times IQR$ 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 $1.5 \times IQR$ 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.

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, *Don't Blame the Faculty for High Tuition: The Annual Report on the Economic Status of the Profession 2003–2004*, Academe: Bull. AAUP (March/April 2004), Washington, DC.

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———, *Graduate Students and Postdoctorates in Science and Engineering: Fall 2001* (NSF 03-320), Arlington, VA, 2003.

———, *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: 2002* (NSF 03-312), Arlington, VA, 2003.

Doctoral Degrees Conferred 2002–2003

Supplementary List

The following list supplements the list of thesis titles published in the February 2004 *Notices*, pages 246–263.

CALIFORNIA

University of California, Davis (1)

MATHEMATICS

Scott, Michael, General relativistic shock-waves propagating at the speed of light.

NEW JERSEY

Princeton University (16)

MATHEMATICS

Askshay, Venkatesh, Limiting forms of the trace formula.

Banner, Adrian, Restriction of the Fourier transforms to quadratic submanifolds.

Booker, Andrew, Numerical tests of modularity.

Chudnovsky, Maria, Berge trigraphs and their applications.

Doran, Brent, Intersection homology hypergeometric functions, and moduli spaces as ball quotients.

Hall, Christopher, L -functions of twisted legendre curves.

Harcos, Gergely, New bounds for automorphic L -functions.

Helfgott, Harald, Root numbers and the parity problem.

Kerr, Matthew, Geometric construction of regular currents with applications to algebraic cycles.

Krieger, Joachim, Global regularity of wave maps in 2 and 3 spatial dimensions.

McKee, Mark, On the finite order of Whittaker functions, Eisenstein series, and automorphic L -functions.

Milley, Peter, Tube volumes and small hyperbolic 3-manifolds.

Parson, James, Level-raising congruences in the representation theory of reductive groups over large fields.

Sepanski, Peter, A Seiberg-Witten product formula for certain circle-bundles over surfaces.

Spinu, Florin, The L^4 norms of the Eisenstein series.

Tymoczko, Julianna, Decomposing Hessenberg varieties over classical groups.

OHIO

Case Western Reserve University (2)

STATISTICS

Subramanian, Neepa, Monte Carlo methods for large queuing networks.

Yan, Guofen, Evaluation of Bayesian diagnostic methods for hierarchical data.

OREGON

Portland State University (1)

MATHEMATICS

Rosson, John, Multiplicative invariants of special 2-complexes.