2001 Annual Survey of the Mathematical Sciences

(Second Report)

Updated Report on the 2001 Survey of New Doctoral Recipients
Starting Salary Survey of New Doctoral Recipients

Don O. Loftsgaarden, James W. Maxwell, and Kinda Remick Priestley

This Second Report of the 2001 Survey gives an update of the 2000–2001 new doctoral recipients from the First Report, which appeared in the *Notices of the AMS* in February 2002, pages 217–31. 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 2001 Annual Survey represents the forty-fifth in an annual series begun in 1957 by the American Mathematical Society. The 2001 Survey is under the direction of the Annual Survey 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 Lorraine Denby, J. Douglas Faires, Alexander J. Hahn, Peter E. Haskell, G. Samuel Jordan, Stephen F. Kennedy, Ellen E. Kirkman, Don O. Loftsgaarden (chair), and James W. Maxwell (ex officio). The committee is assisted by AMS survey analyst Kinda Remick Priestley and survey coordinator Colleen Rose. Comments or suggestions regarding this Survey Report may be directed to the committee.

Update on the 2001 New 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 in the box on page 814 of this report. Departments in the former Group Vb (operations research and management science) are no longer being surveyed.

This Second Report includes data from two parts of the 2001 Annual Survey. First, we update information about new doctoral recipients reported earlier in the February 2002 issue. Second, we present the starting salaries of the new doctoral recipients who responded to a follow-up survey. Prior to 2000 this report contained a third part presenting information about the faculties and instructional programs at the undergraduate and graduate levels in these departments for the 2001–2002 academic year. Starting with the 2000 survey, we chose to present this data in a separate report that will be published in the September issue of the *Notices of the AMS*.

The names of the 2000–2001 doctoral recipients and their thesis titles were published in "Doctoral Degrees Conferred" (*Notices of the AMS*, February 2002, pages 241–57). This list has been supplemented by 57 additional new doctorates that have been reported since the original list was published. The supplemental listing appears at the end of this report on pages 815-16. The response rate from doctoral-granting departments was lower than normal at the time the First Report was published. An aggressive follow-up for nonresponding departments resulted in the reporting of 57 more new doctoral recipients for 2000–2001, a much higher increase than most previous Second Reports.

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Highlights

There were 1,065 new doctoral recipients from U.S. institutions for 2000–2001, down 62 from the previous year. This is the smallest number of new doctoral recipients since 1993–1994, when there were 1,034.

The final 2000–2001 unemployment rate for new doctoral recipients was 3.7%, up from 3.3% last year.

During the past four years the number of new doctoral recipients has dropped from 1,176 to 1,065. Nearly all of this drop is due to a drop in non-U.S. citizen new doctoral recipients, which have dropped from 639 to 533.

Females totaled 311 of the new doctoral recipients, up slightly from 304 last year and the second highest number ever recorded. Females make up 29.2% of the new doctoral recipients. The 754 male new doctoral recipients is down 69 from 823 last year.

There were 532 U.S. citizen new doctoral recipients, which is 50.0% of the total. This percentage has been very close to 50% for the past three years. There were 166 female U.S. citizen doctoral recipients, up 2 from last year and second only to the 188 two years ago. The number of male U.S. citizen new doctoral recipients was 366, down from 402 last year. The percentage of female U.S. citizens, 31.2%, is the second highest percentage ever, second only to the 33.6% reported two years ago.

Of the 914 new doctoral recipients known to have employment in October 2001, 818 (89.5%) were employed in the U.S. Of these 818 employed in the U.S., 574 have academic employment (including research institutes and other nonprofits.) This number is down 16 from last year and down 36 from two years ago.

Among the 818 new doctoral recipients having employment in the U.S., 29.8% took nonacademic positions (government or business and industry), compared to 31.1% last year.

Median salaries for new doctoral recipients taking 9–10-month positions in U.S. academic institutions remained at $41,300 for females, while males rose from $41,500 to $43,000.

The median age for new doctoral recipients is 31.0, and the average age is 32.4, both up slightly from last year.

Information about recipients of doctoral degrees awarded between July 1, 2000, and June 30, 2001, was collected from doctorate-granting departments beginning in late spring 2001 and from a follow-up census of individual degree recipients beginning in October. The "2001 Annual Survey First Report" (*Notices of the AMS*, February 2002, pages 217–31) presented survey results obtained about new doctoral recipients from the departments. Here we update information for new doctoral recipients using data gathered with a questionnaire, Employment Experiences of New Doctoral Recipients (EENDR.) The EENDR was sent in early October 2001 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.

Updated Employment Status of U.S. New Doctoral Recipients, 2000–2001

Table 1A shows the fall and final counts of new doctoral recipients in the mathematical sciences awarded by U.S. institutions from 1992 through 2001. 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 previous reports to exclude new doctorates data from Group Vb departments, which are no longer surveyed.

Table 1A: U.S. New Doctoral Recipients, Fall and Final Counts, 1992 to 2001

Year	Fall	Final
1992–1993	1104	1116
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

Table 1B: Citizenship of New Doctoral Recipients, 1998–2001

Year	U.S.	Non-U.S.	Total
1997–1998	537	639	1176
1998–1999	560	575	1135
1999–2000	566	561	1127
2000–2001	532	533	1065

Table 1B shows trends in the number of new doctoral recipients for the past four years broken down by U.S. citizens and non-U.S. citizens. There has been a drop of 111 new doctorates during those four years, and nearly all of this drop can be explained by a drop of 106 non-U.S. citizen new doctoral recipients. These trends bear watching in the future. The all-time high number of non-U.S. citizen new doctoral recipients is 679 in 1992–1993.

Table 1C: 2000–2001 U.S. New Doctoral Recipients by Type of Degree-Granting Department

	I (Pu)	I (Pr)	II	III	IV	Va
Number	235	132	207	138	272	81
%	22.1	12.4	19.4	13.0	25.5	7.6

Table 1C gives a breakdown of the 1,065 doctoral degrees awarded in the mathematical sciences between July 1, 2000, and June 30, 2001, by type of degree-granting department.

Table 2A: 2000–2001 U.S. Doctoral Recipients: Field of Thesis by Fall 2001 Employment Status, April 2002

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	Applied Math.	Numerical Analysis/ Approxi-mations	Linear Nonlinear Optim./ Control	Differential, Integral, & Difference Equations	Math. Education	Other/ Unknown	
Group I (Public)		16	15	9	10	4	1	4	3	1	12	1	2	**78**
Group I (Private)		13	6	17	5	2	2	2	6	2	5	0	1	**61**
Group II		10	8	9	6	0	2	5	3	1	7	2	0	**53**
Group III		9	2	1	1	0	3	2	0	0	4	0	0	**22**
Group IV		0	1	0	0	7	39	0	0	0	0	0	2	**49**
Group Va		0	1	1	1	0	0	4	1	1	2	0	0	**11**
Master's		9	6	6	4	4	10	3	2	4	11	3	1	**63**
Bachelor's		24	16	14	19	4	6	7	6	3	7	6	3	**115**
Two-Year College		6	1	2	2	0	1	0	0	1	2	2	0	**17**
Other Academic Dept.		4	1	1	4	4	37	13	4	2	4	4	1	**79**
Research Institute/ Other Nonprofit		3	1	1	3	1	11	2	2	1	1	0	0	**26**
Government		4	1	2	1	1	24	5	5	2	5	0	0	**50**
Business and Industry		11	9	7	12	9	87	25	15	5	12	0	2	**194**
Non-U.S. Academic		11	9	14	6	2	18	6	0	3	9	2	0	**80**
Non-U.S. Nonacademic		2	2	0	0	1	7	1	1	1	1	0	0	**16**
Not Seeking Employment		2	1	1	4	0	5	2	0	0	1	1	0	**17**
Still Seeking Employment		6	2	2	2	2	10	7	0	1	4	0	0	**36**
Unknown (U.S.)		5	2	3	7	0	24	9	4	0	3	4	1	**62**
Unknown (non-U.S.)[1]		7	1	7	2	2	8	0	3	1	5	0	0	**36**
COLUMN TOTAL		**142**	**85**	**97**	**89**	**43**	**295**	**97**	**55**	**29**	**95**	**25**	**13**	**1065**
COLUMN SUBTOTALS	Male	109	72	69	63	35	174	75	43	22	70	15	7	**754**
	Female	33	13	28	26	8	121	22	12	7	25	10	6	**311**

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

Table 2B: 2000–2001 U.S. Doctoral Recipients: Type of Degree-Granting Department by Fall 2001 Employment Status, April 2002

TYPE OF EMPLOYER		TYPE OF DOCTORAL DEGREE-GRANTING DEPARTMENT						ROW TOTAL	ROW SUBTOTAL	
		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)		45	11	13	5	1	3	**78**	59	19
Group I (Private)		27	27	1	0	3	3	**61**	51	10
Group II		18	5	18	8	3	1	**53**	37	16
Group III		11	1	3	4	2	1	**22**	18	4
Group IV		1	2	1	0	45	0	**49**	32	17
Group Va		5	1	0	0	0	5	**11**	9	2
Master's		4	3	26	19	8	3	**63**	46	17
Bachelor's		28	8	43	30	5	1	**115**	76	39
Two-Year College		6	1	6	4	0	0	**17**	11	6
Other Academic Dept.		10	6	14	8	31	10	**79**	52	27
Research Institute/ Other Nonprofit		4	6	1	2	10	3	**26**	17	9
Government		3	4	13	5	21	4	**50**	28	22
Business and Industry		28	15	27	26	75	23	**194**	150	44
Non-U.S. Academic		20	15	18	5	16	6	**80**	61	19
Non-U.S. Nonacademic		2	3	2	0	6	3	**16**	14	2
Not Seeking Employment		3	4	2	3	5	0	**17**	9	8
Still Seeking Employment		7	5	4	5	10	5	**36**	19	17
Unknown (U.S.)		10	4	12	9	23	4	**62**	42	20
Unknown (non-U.S.)[1]		3	11	3	5	8	6	**36**	23	13
COLUMN TOTAL		**235**	**132**	**207**	**138**	**272**	**81**	**1065**	**754**	**311**
COLUMN SUBTOTALS	Male	174	110	150	101	160	59	**754**		
	Female	61	22	57	37	112	22	**311**		

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

Table 2C: 2000–2001 New Doctoral Recipients: Field of Thesis by Type of Degree-Granting Department, April 2002

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	Applied Math.	Numerical Analysis/ Approxi-mations	Linear Nonlinear Optim./ Control	Differential, Integral, & Difference Equations	Math. Education	Other/ Unknown	
Group I (Public)	60	30	39	27	8	7	15	8	5	29	0	7	235
Group I (Private)	33	8	30	14	6	2	13	5	4	17	0	0	132
Group II	39	30	18	20	10	8	24	18	11	20	8	1	207
Group III	8	14	9	13	4	25	13	12	4	19	17	0	138
Group IV	0	1	0	0	14	244	8	0	0	0	0	5	272
Group Va	2	2	1	15	1	9	24	12	5	10	0	0	81
Total	**142**	**85**	**97**	**89**	**43**	**295**	**97**	**55**	**29**	**95**	**25**	**13**	**1065**

Table 2D: Percentage of Total Employed New Doctoral Recipients by General Employment Sector, Fall 1998 to Fall 2001

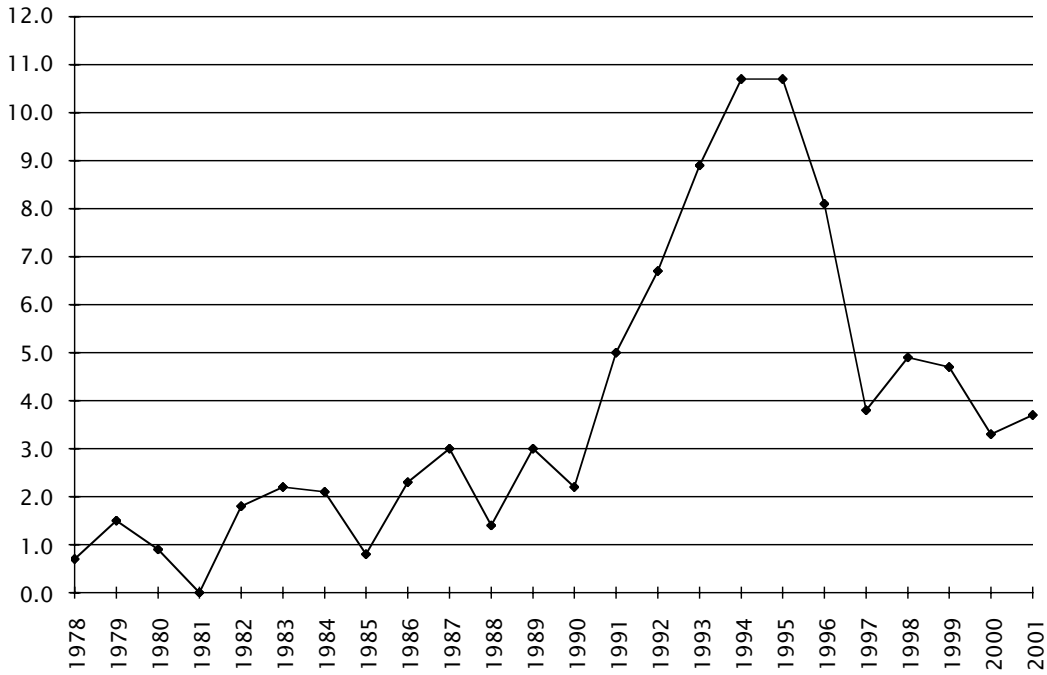
%	U.S.		Non-U.S.		Total Number
	Academic	Nonacademic	Academic	Nonacademic	
Fall 1998	56.7	29.3	11.9	2.1	965
Fall 1999	63.9	23.5	10.7	2.0	955
Fall 2000	61.7	27.8	9.6	0.9	957
Fall 2001	62.8	26.7	8.8	1.8	914

Tables 2A, 2B, and 2C display updates of employment data, found in these same tables in the First Report, for the fall count of 2000–2001 doctoral recipients plus 57 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 2001 employment status of 967 of the 1,065 doctoral recipients was known.

The fall 2001 unemployment rate for new doctoral recipients, based on information gathered by the time of the Second Report, was 3.7%. The unemployment rate rose steadily in the early 1990s and reached its all-time high of 10.7% in 1994 and held that rate through 1995. It began to decrease in 1996, reaching 3.3% for 2000, the lowest it has been in the past ten years. Figure 1 presents the fall 1978 through fall 2001 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

Figure 1: Percentage of New Doctoral Recipients Unemployed, As Reported in the Respective Annual Survey Second Reports, 1978–2001

Year	Percentage
1978	0.7
1979	1.5
1980	0.9
1981	0.0
1982	1.8
1983	2.2
1984	2.1
1985	0.8
1986	2.3
1987	3.0
1988	1.4
1989	3.0
1990	2.2
1991	5.0
1992	6.7
1993	8.9
1994	10.7
1995	10.7
1996	8.1
1997	3.8
1998	4.9
1999	4.7
2000	3.3
2001	3.7



was unknown at the time of the Second Report. Note that prior to 1999 the new doctoral recipients from Group Vb are included in the total unemployment rate for each year.

Of the 967 new doctoral recipients whose employment is known, 818 were employed in the U.S., 96 were employed outside the U.S., 36 were still seeking employment, and 17 were not seeking employment.

Table 2D presents the trend in the percentage of employed new doctoral recipients by general employment sector for the last four years. Academic employment includes those employed by research institutes and other nonprofits.

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 13.3%, while the percentage for those with theses in probability or statistics is the highest at 44.9%.

Tables 3A through 3E 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 individual new doctoral recipients who responded to a follow-up questionnaire. The next few paragraphs discuss some of the information presented in these tables.

Table 3A: Number of New Doctoral Recipients Taking Positions in U.S. Business and Industry by Type of Degree-Granting Department, Fall 1998 to Fall 2001

Group	I (Pu)	I (Pr)	II	III	IV	Va	**Total**
Fall 1998	37	27	44	25	75	26	**234**
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**

Table 3B: Number of New Doctoral Recipients Taking U.S. Academic Positions by Type of Degree-Granting Department, Fall 1998 to Fall 2001

Group	I (Pu)	I (Pr)	II	III	IV	Va	**Total**
Fall 1998	133	100	138	61	85	30	**547**
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**

Table 3A shows that 29 fewer new doctoral recipients accepted jobs in U.S. business and industry compared to last year, a decrease of 13.0%.

From Table 3B we see that 16 fewer new doctoral recipients were hired in U.S. academic institutions than last year, a decrease of 2.7%.

Table 3C: U.S. Academic Positions Filled by New Doctoral Recipients by Type of Hiring Department, Fall 1998 to Fall 2001

Group	I–III	IV	Va	M&B	Other	**Total**
Fall 1998	187	36	5	203	116	**547**
Fall 1999	233	47	19	193	118	**610**
Fall 2000	216	51	11	180	132	**590**
Fall 2001	214	49	11	178	122	**574**

Table 3C shows that Groups I–III, IV, Va, and M&B all hired approximately the same number of new doctoral recipients as they did last year, while "Other" hired 10 fewer.

Table 3D gives information about the production and hiring of female new doctoral recipients in the doctoral-granting departments of this survey. From Table 2B we see that 27.0% of the new doctoral recipients hired by Group M departments were female, while 33.9% of those hired by Group B departments were female.

Table 3D: Females as a Percentage of New Doctoral Recipients Produced and Hired by Doctoral-Granting Departments, Fall 2001

%	I (Pu)	I (Pr)	II	III	IV	Va	**Total**
Produced	26.0	16.7	27.5	26.8	41.2	27.2	**29.2**
Hired	24.4	16.4	30.2	18.2	34.7	18.2	**24.8**

Table 3E shows that the new doctoral recipients from Group Va departments have the highest unemployment rate this year at 7.0%, while those from Group II departments have the lowest unemployment rate at 2.1%. Overall, 3.7% of the new doctoral recipients were unemployed.

Table 3E: Percentage of Unemployed New Doctoral Recipients by Type of Degree-Granting Department, Fall 1998 to Fall 2001

%	I (Pu)	I (Pr)	II	III	IV	Va	**Total**
Fall 1998	5.4	3.7	7.0	8.9	3.1	1.4	**4.9**
Fall 1999	5.7	2.8	5.5	4.2	4.3	4.5	**4.7**
Fall 2000	5.2	4.3	2.1	1.8	2.3	5.5	**3.3**
Fall 2001	3.2	4.3	2.1	4.0	4.1	7.0	**3.7**

Table 3F: 2000–2001 Male New Doctoral Recipients: Type of Citizenship by Fall 2001 Employment Status

TYPE OF EMPLOYER	CITIZENSHIP				MALE DOCTORAL RECIPIENTS
	U.S. CITIZENS	NON-U.S. CITIZENS			
		Permanent Visa	Temporary Visa	Unknown Visa	
U.S. Employer	317	49	206	14	586
U.S. Academic	231	30	141	6	408
Groups I, II, III, and Va	92	14	65	3	174
Group IV	7	5	18	2	32
Non-Ph.D. Department	121	11	52	1	185
Research Institute/Other Nonprofit	11	0	6	0	17
U.S. Nonacademic	86	19	65	8	178
Non-U.S. Employer	8	1	60	6	75
Non-U.S. Academic	7	0	50	4	61
Non-U.S. Nonacademic	1	1	10	2	14
Not Seeking Employment	5	1	2	1	9
Still Seeking Employment	15	2	2	0	19
SUBTOTAL	**345**	**53**	**270**	**21**	**689**
Unknown (U.S.)	20	4	16	2	42
Unknown (non-U.S.)[1]	1	0	19	3	23
TOTAL	**366**	**57**	**305**	**26**	**754**

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

Table 3G: 2000–2001 Female New Doctoral Recipients: Type of Citizenship by Fall 2001 Employment Status

TYPE OF EMPLOYER	CITIZENSHIP				FEMALE DOCTORAL RECIPIENTS
	U.S. CITIZENS	NON-U.S. CITIZENS			
		Permanent Visa	Temporary Visa	Unknown Visa	
U.S. Employer	140	26	59	7	232
U.S. Academic	104	17	42	3	166
Groups I, II, III, and Va	26	6	19	0	51
Group IV	8	3	4	2	17
Non-Ph.D. Department	65	7	16	1	89
Research Institute/Other Nonprofit	5	1	3	0	9
U.S. Nonacademic	36	9	17	4	66
Non-U.S. Employer	3	0	18	0	21
Non-U.S. Academic	3	0	16	0	19
Non-U.S. Nonacademic	0	0	2	0	2
Not Seeking Employment	8	0	0	0	8
Still Seeking Employment	4	3	10	0	17
SUBTOTAL	**155**	**29**	**87**	**7**	**278**
Unknown (U.S.)	11	3	5	1	20
Unknown (non-U.S.)[1]	0	0	12	1	13
TOTAL	**166**	**32**	**104**	**9**	**311**

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

Updated Information about 2000–2001 New Doctoral Recipients by Sex and Citizenship

Tables 3F and 3G show the sex and citizenship of the 1,065 new doctoral recipients and the fact that 818 new doctoral recipients found jobs in the U.S. this year. This is 89.5% of the 914 new doctoral recipients known to have jobs in October 2001.

Sex and citizenship is known for all of the 1,065 new doctoral recipients. The final count of new doctoral recipients who are U.S. citizens is 532 (50.0%). For the past three years, this figure has remained very close to 50%, the largest percentages reported by the Annual Survey since the mid-1980s. Pages 222–5 of the First Report present further information related to the citizenship of the 2000–2001 new doctoral recipients.

Of the 532 U.S. citizen new doctoral recipients, 166 are female and 366 are male. The 166 female new doctoral recipients comprise 31.2% of the

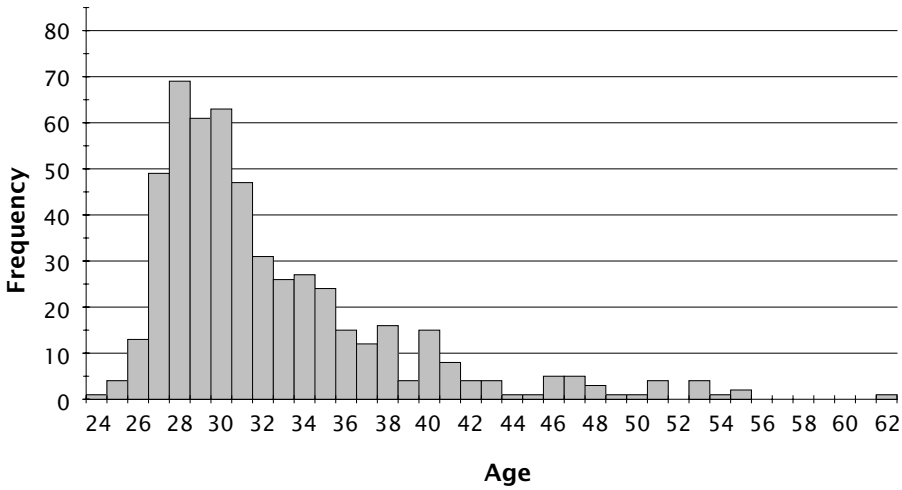
Table 3H: 2000–2001 New Doctoral Recipients Having Fall 2001 Employment in the U.S. by Citizenship and Type of Employer

Employer	U.S.	Non-U.S.	**Total**
U.S. Academic, Groups I–Va	133	141	**274**
U.S. Academic, Other	202	98	**300**
U.S. Nonacademic	122	122	**244**
Total	**457**	**361**	**818**

U.S. citizen total for 2000–2001, an increase from last year's count of 164, or 29.0% of the U.S. citizen new doctoral recipients. The number of U.S. citizen males, 366, is down 36 (9.0%) from 402 last year.

Table 3H shows that while U.S. academic doctoral departments, Groups I through Va, hired 48.5% U.S. citizens, U.S. academic positions other than in the doctoral departments hired 67.3% U.S. citizens. The percentage of U.S. citizens hired for nonacademic positions in the U.S. was 50.0%. Among those 818 2000–2001 doctoral recipients taking employment in the U.S., 29.8% took nonacademic employment (government or business and industry). This is down from 31.1% in 1999–2000.

Figure 2: Age Distribution of 2000–2001 EENDR Respondents



New Information from the EENDR Survey

Of the 1,008 new doctoral recipients reported in the First Report, the 939 whose addresses were known were sent the Employment Experiences of New Doctoral Recipients (EENDR) survey in October 2001, and 530 (56.4%) 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, 68.1%, was from those in academia in the U.S., while the lowest, 46.2%, was from those in foreign nonacademia.

The EENDR gathered details on employment experiences not available through departments. The rest of this section presents the additional information available on this subset of the 2000–2001 doctoral recipients.

Table 4 shows the citizenship of the 530 new doctoral recipients who responded to the EENDR.

Of the 530 total respondents to the EENDR, 473 were employed in the U.S., 42 were employed outside the U.S., 7 were still seeking employment, and 8 were not seeking employment, as of the week of October 10, 2001. The unemployment rate for those responding to the EENDR is 1.3%. Among those employed in the U.S., 456 were employed full-time and 16 were employed part-time (one individual did not answer this question). Of the 16 reporting part-time employment, 8 reported that they were working part-time because a suitable full-time job was not available, while 4 reported they were working part-time while they pursued additional education.

Table 4: 2000–2001 EENDR Respondents: Type of Citizenship by Fall 2001 Employment Status

TYPE OF EMPLOYER	CITIZENSHIP				TOTAL EENDR RESPONDENTS
	U.S. CITIZENS	NON-U.S. CITIZENS			
		Permanent Visa	Temporary Visa	Unknown Visa	
U.S. Employer	290	34	149	0	**473**
U.S. Academic	224	22	114	0	**360**
Groups I, II, III, and Va	75	7	54	0	**136**
Group IV	10	5	15	0	**30**
Non-Ph.D. Department	127	10	40	0	**177**
Research Institute/Other Nonprofit	12	0	5	0	**17**
U.S. Nonacademic	66	12	35	0	**113**
Non-U.S. Employer	6	0	35	1	**42**
Non-U.S. Academic	6	0	30	0	**36**
Non-U.S. Nonacademic	0	0	5	1	**6**
Not Seeking Employment	7	0	1	0	**8**
Still Seeking Employment	4	2	1	0	**7**
SUBTOTAL	**307**	**36**	**186**	**1**	**530**
Unknown (U.S.)	0	0	0	0	**0**
Unknown (non-U.S.)[1]	0	0	0	0	**0**
TOTAL	**307**	**36**	**186**	**1**	**530**

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

Among the 473 employed in the U.S., 266 reported obtaining a permanent position and 205 a temporary position (two individuals did not answer this question). Of the 205 in temporary positions, 93 (45.4%) reported taking temporary employment because a suitable permanent position was not available and 163 (79.5%) classified their position as postdoctoral. Furthermore, among those in postdoctoral positions, 30.7% responded that they took the position because a suitable permanent position was not available.

Among the 266 who reported obtaining a permanent position in the U.S., 61.7% were employed in academia (including 3.8% in research institutes and other nonprofits), 32.3% in business or industry, and 6.0% in government. Women held 32.0% of the permanent positions.

Among the 205 individuals with temporary employment in the U.S., 95.1% were employed in academia (including 3.4% in research institutes and other nonprofits), 0.5% in business or industry, and 4.4% in government.

Among the 42 individuals employed outside the U.S., 85.7% were employed in academia (including 9.5% in research institutes and other nonprofits) and the other 14.3% were in business or industry. None were employed in government. Six of those employed outside the U.S. were U.S. citizens, 5 of which were in temporary positions, while none were U.S. permanent residents.

Figure 2 gives the age distribution of the 522 new doctoral recipients who responded to this question. The median age of new doctoral recipients was 31.0, while the mean age was 32.4. The first and third quartiles were 28 and 35 respectively. These figures are very similar to those reported in previous years.

Starting Salary Survey of New Doctoral Recipients

The starting salary figures for 2001 were compiled from information gathered on the EENDR questionnaires sent to individuals who received doctoral degrees in the mathematical sciences during the 2000–2001 academic year from universities in the United States (see previous section for more details).

The questionnaires were distributed to 939 recipients of degrees using addresses provided by the departments granting the degrees; 530 individuals responded between late October and April. Responses with insufficient data or from individuals who indicated they had part-time employment were considered unusable. 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.

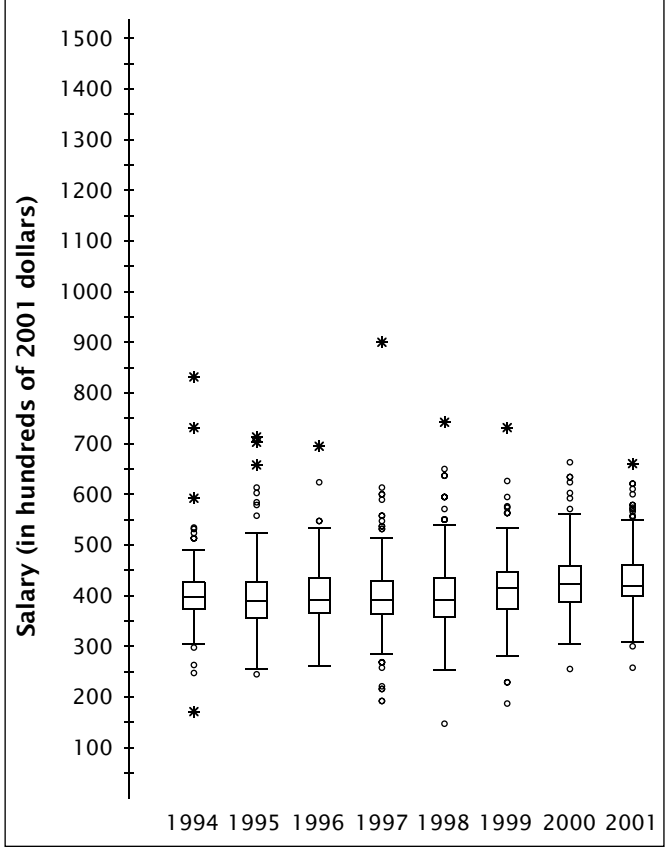
Key to Tables. Salaries are listed in hundreds of dollars. Nine-month salaries are based on 9–10 months' teaching and/or research, not adding extra stipends for summer grants or summer teaching or the equivalent. Years listed are the academic year in which the doctorate was received. M and F are male 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 1965 through 1980. All categories of "Teaching or Teaching and Research" and "Research" contain only those recipients employed at academic institutions. The "Research, 9–10-Month Salaries" table was dropped as of 1998 because so few recipients respond in this category that the data was not considered meaningful. Starting salaries for those reporting a postdoctoral position are available for a fifth year. These salaries are also included within the academic tables and boxplots on pages 811-13.

Graphs. The graphs show standard boxplots summarizing salary distribution information for the years 1994 through 2001. Values plotted for 1994 through 2000 are converted to 2001 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 1.5xIQR below Q1 and 1.5xIQR 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 1.5xIQR 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 o 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.

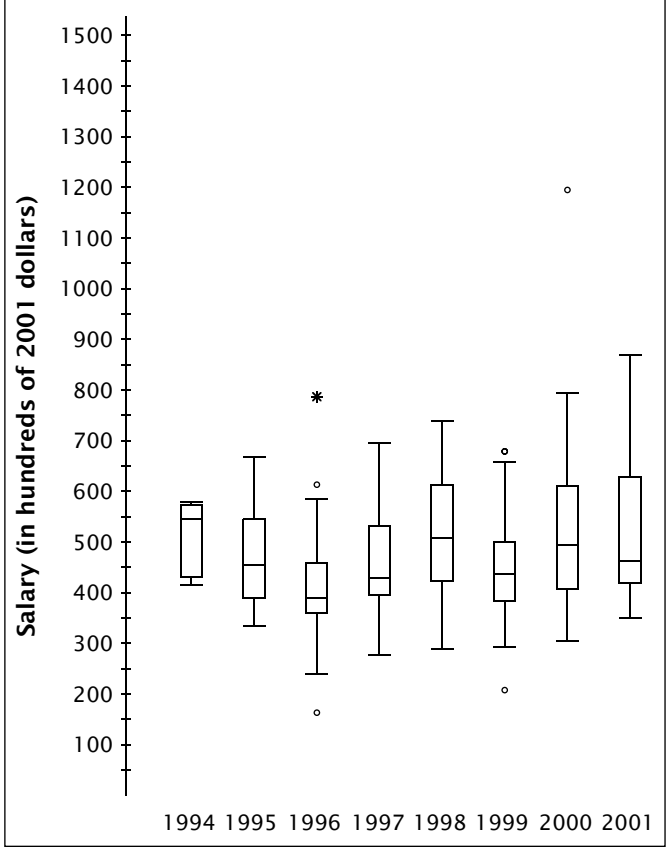
Academic Teaching/Teaching and Research 9–10-Month Salaries (in hundreds of dollars)

Ph.D. Year	Min	Q_1	Median	Q_3	Max	Reported Median in 2001 $
1965	70	---	80	---	105	368
1970	85	---	110	---	195	414
1975	90	120	128	135	173	350
1980	105	155	171	185	250	328
1985	170	230	250	270	380	371
1990	230	305	320	350	710	405
1994	150	330	350	375	730	399
1995	220	320	350	382	640	390
1996	240	333	360	400	636	394
1997	180	340	366	400	840	393
1998	140	340	370	410	700	392
1999	180	360	400	430	700	418
2000	250	380	415	450	650	424
2001	259	400	420	461	660	420
1997 M	180	340	367	400	571	---
1997 F	180	340	366	396	840	---
1998 M	140	340	370	411	700	---
1998 F	250	350	377	409	600	---
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	---
Total (158 male/68 female)						
2001 M	259	400	430	475	660	430
2001 F	310	390	413	443	620	413
One year or less experience (133 male/60 female)						
2001 M	259	400	430	465	660	430
2001 F	310	390	415	439	620	415



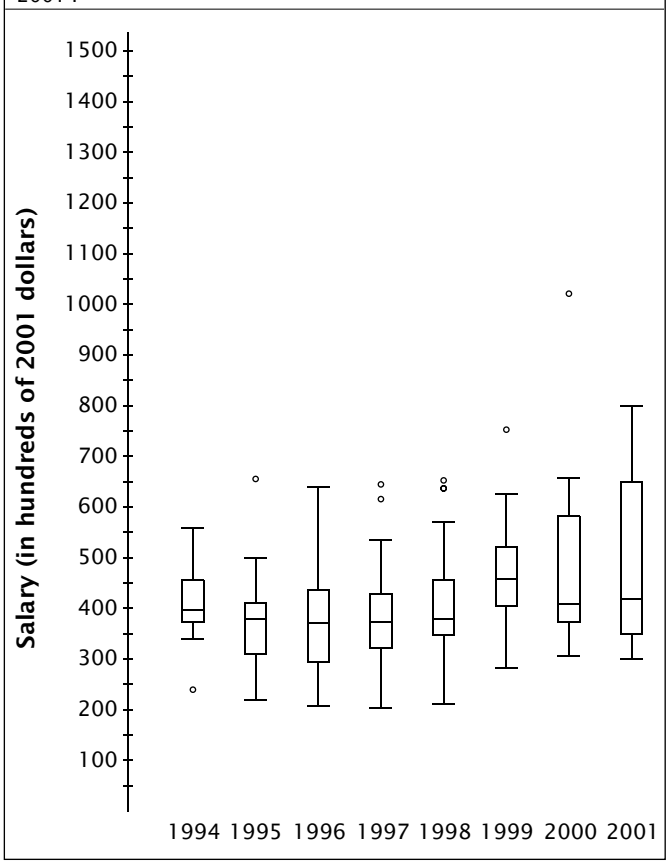
Academic Teaching/Teaching and Research 11–12-Month Salaries (in hundreds of dollars)

Ph.D. Year	Min	Q_1	Median	Q_3	Max	Reported Median in 2001 $
1965	78	---	104	---	121	478
1970	95	---	128	---	200	482
1975	87	---	145	---	204	396
1980	143	---	195	---	350	374
1985	220	230	273	300	470	405
1990	225	318	365	404	670	462
1994	365	391	480	503	510	547
1995	300	354	410	478	600	457
1996	150	302	340	390	720	372
1997	260	370	400	497	650	429
1998	275	403	480	578	700	509
1999	200	374	420	469	650	439
2000	300	400	485	600	1170	496
2001	350	420	465	615	870	465
1997 M	260	360	400	420	635	---
1997 F	260	393	447	505	650	---
1998 M	275	410	495	573	700	---
1998 F	300	395	464	575	630	---
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	---
Total (38 male/18 female)						
2001 M	350	420	443	498	870	443
2001 F	380	465	588	658	750	588
One year or less experience (34 male/15 female)						
2001 M	350	413	440	485	870	440
2001 F	380	465	566	650	750	566



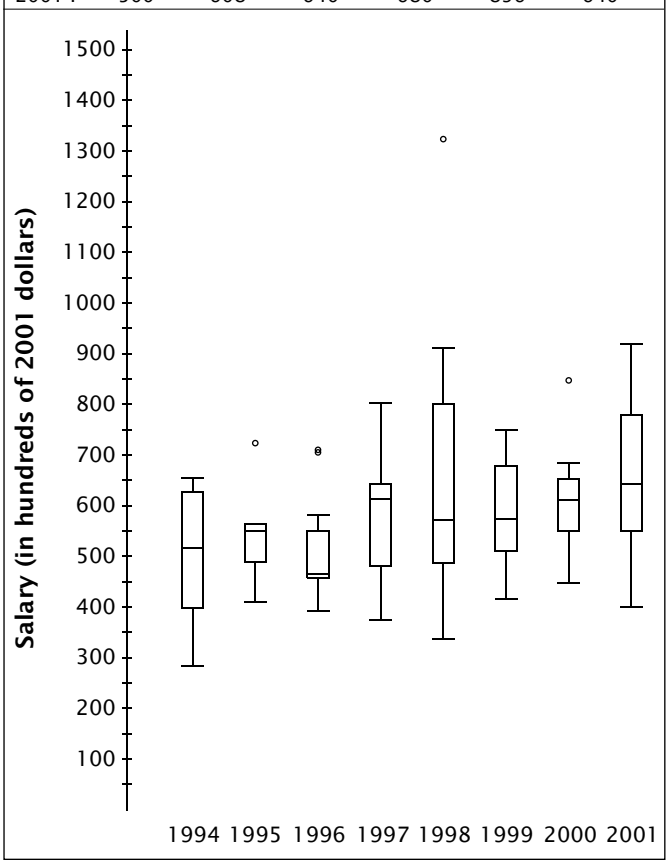
Academic Research Only
11–12-Month Salaries
(in hundreds of dollars)

Ph.D. Year	Min	Q_1	Median	Q_3	Max	Reported Median in 2001 $
1965	81	---	93	---	107	428
1970	90	---	120	---	205	452
1975	90	---	119	---	180	325
1980	120	---	180	---	321	345
1985	190	295	342	400	520	508
1990	180	280	300	365	546	379
1994	210	330	350	400	490	399
1995	196	280	340	370	587	379
1996	192	270	330	400	585	361
1997	190	300	350	400	600	376
1998	200	333	360	428	617	382
1999	270	390	440	500	720	460
2000	300	384	400	555	1000	409
2001	300	367	420	625	800	420
1997 M	210	300	350	406	500	---
1997 F	190	313	350	386	600	---
1998 M	200	340	360	400	600	---
1998 F	285	330	360	540	617	---
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	---
Total (20 male/7 female)						
2001 M	300	348	425	655	800	425
2001 F	342	400	420	588	700	420
One year or less experience (18 male/5 female)						
2001 M	300	343	395	628	800	395
2001 F	---	---	---	---	---	---



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

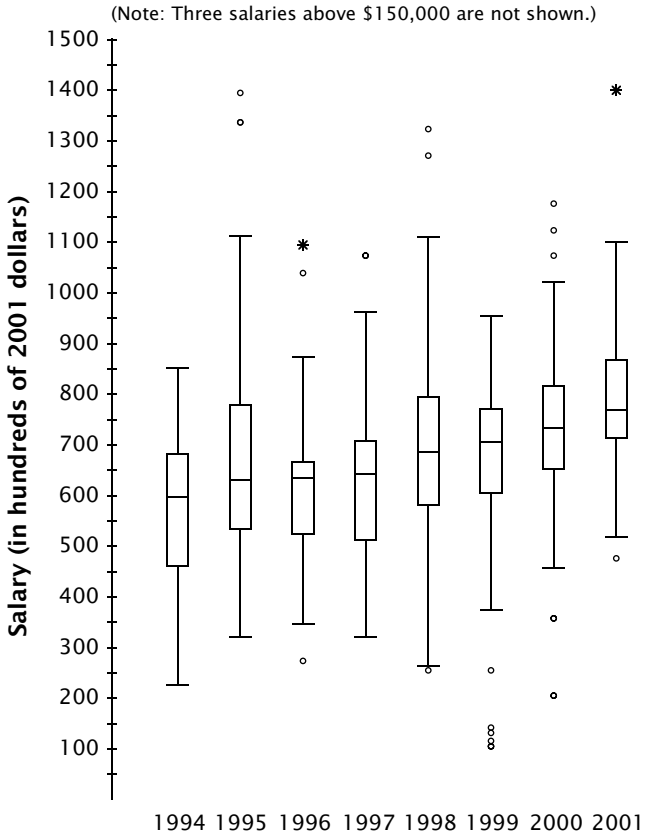
Ph.D. Year	Min	Q_1	Median	Q_3	Max	Reported Median in 2001 $
1965	70	---	126	---	160	580
1970	100	---	150	---	223	565
1975	78	---	182	---	247	497
1980	156	---	244	---	501	468
1985	263	294	325	381	440	482
1990	320	345	378	430	587	478
1994	250	355	455	530	576	518
1995	370	440	494	507	650	551
1996	360	420	427	504	650	467
1997	350	454	573	600	750	615
1998	320	475	540	736	1250	572
1999	400	495	550	651	720	575
2000	440	540	600	640	830	613
2001	400	580	644	758	920	644
1997 M	370	476	573	608	750	---
1997 F	350	465	560	586	680	---
1998 M	320	500	568	756	1250	---
1998 F	---	---	---	---	---	---
1999 M	400	495	540	587	720	---
1999 F	---	---	---	---	---	---
2000 M	440	563	620	649	830	---
2000 F	530	545	566	593	650	---
Total (17 male/7 female)						
2001 M	400	590	647	780	920	647
2001 F	450	550	630	670	896	630
One year or less experience (15 male/6 female)						
2001 M	400	570	640	710	920	640
2001 F	500	608	640	680	896	640



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

Ph.D. Year	Min	Q_1	Median	Q_3	Max	Reported Median in 2001 $
1965	100	---	136	---	180	626
1970	96	---	170	---	235	640
1975	114	---	187	---	240	511
1980	190	---	284	---	400	545
1985	260	360	400	420	493	594
1990	320	438	495	533	700	626
1994	200	418	525	600	750	598
1995	288	480	568	690	1250	633
1996	250	510	580	610	1000	634
1997	300	483	600	658	1000	644
1998	240	550	650	750	2250	689
1999	360	600	680	761	2450	711
2000	200	640	720	800	1500	736
2001	475	716	770	865	1850	770
1997 M	300	490	600	670	1000	---
1997 F	400	460	540	620	900	---
1998 M	240	550	650	750	1250	---
1998 F	305	565	662	765	2250	---
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	---
Total (63 male/19 female)						
2001 M	520	717	788	875	1700	788
2001 F	475	710	750	850	1850	750
One year or less experience (52 male/16 female)						
2001 M	550	734	795	885	1700	795
2001 F	475	715	750	850	1050	750

(Note: Three salaries above $150,000 are not shown.)



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

Ph.D. Year	Min	Q_1	Median	Q_3	Max	Reported Median in 2001 $
1997	180	350	385	410	450	404
1998	290	350	390	420	500	404
1999	130	365	400	418	540	408
2000	300	385	420	450	550	420
2001	250	400	425	450	566	425
1997 M	250	350	380	405	446	---
1997 F	180	350	385	408	450	---
1998 M	290	340	390	430	500	---
1998 F	310	361	375	390	436	---
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	---
Total (54 male/18 female)						
2001 M	250	400	430	454	566	430
2001 F	310	395	421	438	490	395

Acknowledgments

The Annual Survey of the Mathematical Sciences 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.

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 Annual Survey 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/employment/`.

[1]Research-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.*

[2]*These 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.*

Other Data Sources

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____, *Science and Engineering Degrees, by Race/Ethnicity of Recipients: 1990–1998* (NSF 01–327), Detailed Statistical Tables, Arlington, VA, 2001.

____, *Science and Engineering Doctorate Awards: 1999* (NSF 01-314), Detailed Statistical Tables, Arlington, VA, 2001.

____, *Characteristics of Doctoral Scientists and Engineers in the United States: 1999 Early Release Tables* (NSF 01–404), Detailed Statistical Tables, Arlington, VA, 2000.

____, *Women, Minorities, and Persons with Disabilities in Science and Engineering: 2000* (NSF 00–327), Arlington, VA, 2000.

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

_____, *Who Is Unemployed? Factors Affecting Unemployment among Individuals with Degrees in Science and Engineering*, Higher Education Surveys Report (NSF 97–336), Arlington, VA, 1997.

Doctoral Degrees Conferred 2000–2001

Supplementary List

The following list supplements the list of thesis titles published in the February 2002 *Notices*, pages 241–58.

CALIFORNIA

University of California, Berkeley (8)

STATISTICS

Benjamin, *Morris*, Random walks in convex sets.

Cawley, *Simon*, Statistical models for DNA sequencing and analysis.

Gat, *Yoram*, Overfit bounds for classification algorithms.

Hui, *Wang*, Multiple shrinkage estimator.

Kwon, *Jaimyoung*, Calculus of statistical efficiency in general setting; kernal plug-in estimation for Markov chains; hidden Markov modeling of freeway traffic.

Li, *Wei*, Modelling marked point processes with an application to currency exchange rates.

Liang, *Chyng-lan*, The detection of stellar occulations by Kuiper belt objects.

Schweinsburg, *Jason*, Coalescents with simultaneous multiple collisions.

University of California, Santa Barbara (2)

MATHEMATICS

He, *Chiyu*, Moment problems and operator theory.

Stanger, *Adrian*, Vector spaces of modular functions and powers of the partition function.

DISTRICT OF COLUMBIA

George Washington University (4)

STATISTICS

Chen, *Xuejun*, The estimation and asymptotic theory of the multiplicative frailty model.

Moriarity, *Christopher*, Statistical properties of statistical matching.

Sellers, *Kimberly*, Vague coherent systems.

Yu, *Binbing*, Some problems arising in observational studies: Potential effect of selection bias and omitted variables.

MASSACHUSETTS

Harvard University (3)

BIOSTATISTICS

Bellamy, *Scarlett*, Clustered data methods with applications to community-based research.

French, *Jonathan*, Analysis of environmental health data with missing values.

Morales, *Knashawn*, Statistical methods for risk assessment based on epidemiological data.

MISSOURI

University of Missouri, Columbia (3)

MATHEMATICS

Goward, *Russel*, A simple algorithm for principalization of monomial ideals.

Hollenbeck, *Brian*, Best constants for operators involving the Hilbert transform.

Stanislavova, *Milena*, Spectral mappings theorems and invariant manifolds for infinite-dimensional Hamiltonian systems.

NEW YORK

Columbia University (3)

MATHEMATICS

Chau, *Albert*, Flow on noncompact Kahler Einstein metrics.

Kamizono, *Kenji*, Hedging and optimization under transaction costs.

Langmead, *Gregory*, A supersymmetric quantum field theory formulation of the Donaldson polynomial invariants.

OHIO

University of Cincinnati (1)

MATHEMATICAL SCIENCES

Gonchigdanzan, Khurelbaater, Almost sure central limit theorems.

OREGON

Oregon State University (3)

STATISTICS

Hamilton, *Evan*, A linear programming and sampling approach to the cutting-order problem.

Ritter, *Kerry*, Statistical aspects of two measurement problems: Defining taxonomic richness and testing with unanchored responses.

Suh, *Euh-Young*, Semiparametric maximum likelihood for nonlinear regression with measurement errors.

PENNSYLVANIA

Carnegie Mellon University (8)

STATISTICS

DiMatteo, Ilaria, Bayesian curve fitting using tree-knot splines.

DiPietro, Michele, Bayesian inference for discretely sampled diffusion processes with financial applications.

Huang, Tzee-Ming, Convergence rates for posterior distributions.

Johnson, Matthew S., Parametric and nonparametric extensions to unfolding response models.

Jones, Bobby L., Analyzing longitudinal data with mixture models: A trajectory approach.

Lockwood, John R., III, Estimating joint distributions of contaminants in U.S. community water system sources.

Nichols, Thomas E., Spatiotemporal modeling in positron emission tomography.

Tang, Feng, A model-based Bayesian fault diagnostic system with applications to semiconductor manufacturing processes.

Temple University (5)

STATISTICS

Hyslop, Terry, The assessment of individual and population bioequivalence in crossover designs.

Kwagyan, John, Further investigations of the disposition model for correlated binary outcomes.

Lupinacci, Paul, D-optimal designs for a class of nonlinear models.

Xie, Yang, Split-plot type residual effects designs.

Zhang, Daozhi, Pareto optimal designs in behavioral experiments.

TENNESSEE

University of Memphis (8)

MATHEMATICAL SCIENCES

Ackeriman, Michael, On the diameter of graphs after vertex and edge deletion.

Balog, Jozsef, Graph properties and bootstrap percolation.

Ingram, Debra, The construction of generalized minimum aberration designs by efficient algorithm.

Li, Yingfu, Construction of generalized minimum aberration designs through Hadamard matrices and orthogonal arrays.

Soeharyadi, Yudi, Regularity for hyperbolic balance laws.

Wang, Wei, Stochastic and state space model in carcinogenesis and cell population.

Yang, Wenjian, On some exact statistical procedures for analyzing correlated binary.

Zhang, Zhaohua, Natural language sensing and metacognition modeling in software agents.

TEXAS

Rice University (4)

STATISTICS

Boekenhaver, Rachel, Estimating nonlinear functionals of a random field.

Cramer, Roxy, Parameter estimation for discretely observed continuous-time Markov chains.

Shaw, Chad A., Genealogical methods for multitype branching processes with applications in biology.

Wojciechowski, William C., Robust modeling.

UTAH

Utah State University (5)

MATHEMATICS AND STATISTICS

Cui, Xiangchen, MSE bounds and perfect sampling for conditional coding.

Florin, Catrina, Positive solutions obtained as local minima via symmetries, for nonlinear elliptic equations.

Moisen, Gretchen. Comparing nonlinear and nonparametric modeling techniques for mapping and stratification in forest inventories of the interior western USA.

Yan, Huey, Generalized minimum penalized Hellinger distance estimation and generalized penalized Hellinger deviance testing for discrete generalized linear models.

Zhao, Guohua, A new perspective on classification.