

# 1999 Annual Survey of the Mathematical Sciences

(First Report)

## Report on the 1999 New Doctoral Recipients Faculty Salary Survey

*Don O. Loftsgaarden, James W. Maxwell, and Kinda M. Remick*

### Report on the 1999 New Doctoral Recipients

This report presents a statistical profile of recipients of doctoral degrees awarded by departments in the mathematical sciences at universities in the United States during the period July 1, 1998, through June 30, 1999. It includes a preliminary analysis of the employment market for 1998–99 doctoral recipients and a demographic profile summarizing characteristics of citizenship status, sex, and racial/ethnic group. All information came from the departments that gave the degrees. Table 1 provides the departmental response rates for the 1999 Survey of New Doctoral Recipients. See page 238 for a description of the groups.

**Table 1: Response Rates**

<b>Group I</b>	47 of 48 including 0 with 0 degrees
<b>Group II</b>	55 of 56 including 4 with 0 degrees
<b>Group III</b>	70 of 73 including 27 with 0 degrees
<b>Group IV</b>	72 of 91 including 6 with 0 degrees
<b>Group Va</b>	17 of 19 including 1 with 0 degrees
<b>Group Vb</b>	No longer surveyed

### Recent Changes in Procedures for the Annual Survey

Data used for the First Report of the Annual Survey is gathered from doctoral-granting departments starting in May each year. Updated information from the individual new doctoral recipients is gathered in the fall each year, and this information is used to update the results from the First Report in the Second Report, which appears in an issue of *Notices* the following sum-

This First Report of the 1999 Annual Survey gives information about the employment status of 1998–99 new doctoral recipients from U.S. departments in the mathematical sciences and salary data on faculty members in U.S. departments of mathematical sciences in four-year colleges and universities. The report is based on information collected from a questionnaire distributed in May. A second questionnaire concerned with data on fall 1999 enrollments, majors, and departmental faculty size was distributed in October 1999. A questionnaire was also distributed to the individual new doctoral recipients in October 1999. Results from the second questionnaire will appear in the Second Report of the 1999 Annual Survey in a summer 2000 issue of the *Notices*. The questionnaire sent to new doctoral recipients will be used to update and revise results in this report, and those results will also appear in the Second Report.

The 1999 Annual Survey represents the forty-third in an annual series begun in 1957 by the American Mathematical Society. The 1999 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 Paul W. Davis, Lorraine Denby, Malay Ghosh, Mary W. Gray, Alfred W. Hales, James Kister, James Lewis, Don O. Loftsgaarden (chair), James W. Maxwell (ex officio), Yashaswini Mittal, and Ann E. Watkins. The committee is assisted by AMS survey analyst Kinda Remick and survey coordinator Colleen Rose. Comments or suggestions regarding this Survey Report may be directed to the Committee.

mer. For the 1996 Annual Survey and earlier surveys, data from the individual new doctoral recipients was gathered earlier, and early responses were used in the First Report. This means that results in First Reports after 1996 are not strictly comparable with those in earlier reports.

Definitions of the groups surveyed in these Annual Surveys are on page 238 of this report. Prior to 1999, Group V was comprised of Groups Va and Vb, with Group Va containing Applied Mathematics/Applied Science doctoral departments and Vb containing Operations Research/Management Science doctoral depart-

## Highlights

Based on responses from departments alone, the preliminary unemployment rate for the 1,133 new doctoral recipients from 1998–99 is 6.2%. If past history holds true, when this figure is revised using information from the individual doctoral recipients, it will likely be less than 4%. The fall 1998 unemployment rate, with degrees from Vb removed, was 7.6%.

Of the new doctoral recipients who have jobs, 72 (8.2%) have positions in the institution from which they received their degrees, though not necessarily in the same department, and 21 (2.4%) have part-time jobs.

Of those doctoral recipients employed in the U.S., 160 (21.1%) have jobs in business and industry, down from 219 (28.7%) in 1997–98. This is a complete reversal in what has been an increasing trend for the past several years. The number of new doctoral recipients employed in U.S. academic positions increased by 63 (12.6%) over 1997–98. The increase of 63 new doctoral recipients taking academic positions is very close to the decrease of 59 new doctoral recipients taking jobs in business and industry.

Females account for 28.1% of the 1,133 new doctoral recipients, up from 24.3% in 1997–98. Of the 554 U.S. citizen new doctoral recipients, 33.8% are females, up from 27.6% in 1997–98. The number of female U.S. citizen new doctoral recipients increased from 156 in 1997–98 to 187 in 1998–99, while the total number of new doctorates in 1998–99 is down 30 from 1997–98. The 1998–99 numbers for females are all record highs.

Of the 1,133 new doctoral recipients in 1998–99, 48.9% are U.S. citizens, up slightly from 48.6% in 1997–98. This is the highest percentage of U.S. citizens since 1987.

Among U.S. citizen new doctoral recipients, the number of Black or African Americans and Hispanic or Latinos remained nearly the same as in 1997–98, with 12 in each group in 1998–99. The largest minority group was Asians with 18. Whites accounted for 506 (91.3%) of U.S. citizen degrees.

Among new doctoral recipients hired in U.S. doctoral-granting departments, 49.8% were U.S. citizens. For other U.S. academic positions, 69.3% of the new doctoral recipients hired were U.S. citizens.

ments. Response rates for Vb departments have always been very poor, and many of the departments are inherently quite different from the other departments included in the Annual Surveys. Beginning with the 1999 Survey, the Annual Survey Data Committee decided to no longer survey Group Vb. Hence Group V now contains only Group Va, Applied Mathematics/Applied Science departments. The average number of doctoral degrees reported by responding Group Vb departments in 1995, 1996, 1997, and 1998 was 55. This change means the number of doctoral degrees in the 1999 First Report is not strictly comparable to those of earlier First Reports.

In 1999, 9 new statistics departments were added to Group IV, doctoral-granting statistics departments, to make this group more complete.

### Note:

Whenever comparisons are made between 1997–98 and 1998–99 numbers, the 1997–98 numbers have been adjusted by removing Vb doctoral recipients from the numbers given in the 1997–98 First Report. This is done because Group Vb departments are no longer a part of the Annual Survey beginning with the 1998–99 Annual Survey. This means that many of the 1997–98 numbers used in comparisons in this report will not coincide exactly with those in the 1997–98 First Report published last year.

### Doctoral Degrees Granted

Table 2 shows the number of new doctoral degrees granted by the different doctoral groups surveyed in the Annual Survey for the past five years. Since Group Vb has been dropped from the Annual Survey beginning in 1998–99, doctorates reported by Vb departments in earlier years are not shown in Table 2. The 1,133 new doctorates granted by these departments in 1998–99 is a decrease of 30 compared to 1997–98. Groups I (Public–Pu), I (Private–Pr), II, and Va showed decreases, while Group III increased by 7 and Group IV increased by 30 compared to 1997–98. The increase of 30 in Group IV is explained at least in part by the addition of nine new statistics departments to this group for the 1998–99 survey. The names of the 1,133 new doctoral recipients are found on pages 253–71 of this issue of the *Notices*. The numbers in Table 2 will be broken down in various ways, such as by gender, in later sections of this report.

**Table 2: New Doctoral Degrees Awarded by Groups I–Va, Fall Count**

Group	I (Pu)	I (Pr)	II	III	IV	Va	Total*
1994–95	458		205	220	195	70	1148
1995–96	325	174	222	124	172	81	1098
1996–97	297	187	238	132	197	72	1123
1997–98	306	174	264	129	213	77	1163
1998–99	292	152	241	136	243	69	1133

\*Does not include Vb. See "Recent Changes in Procedures" on page 231.

*Don O. Loftsgaarden is professor emeritus of mathematics at the University of Montana. James W. Maxwell is AMS associate executive director for Professional Programs and Services. Kinda M. Remick is AMS survey analyst.*

**Table 3A: Employment Status of 1998–99 U.S. New Doctoral Recipients in the Mathematical Sciences by Field of Thesis**

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/Approximations	Linear Nonlinear Optim./Control	Differential, Integral, & Difference Equations	Math. Education	Other/Unknown	
Group I (Public)	22	8	21	9	3	0	4	5	1	9	0	0	82
Group I (Private)	11	7	14	2	2	1	7	3	0	7	0	0	54
Group II	15	10	10	3	2	0	5	6	1	5	1	0	58
Group III	5	3	3	2	0	7	1	0	2	3	1	0	27
Group IV	1	0	0	0	1	45	0	0	0	2	0	0	49
Group Va	0	0	0	1	1	2	5	5	1	2	0	0	17
Master's	13	10	7	5	0	6	1	2	1	2	2	0	49
Bachelor's	28	17	20	20	3	8	6	9	1	11	2	1	126
Two-Year College	3	2	0	2	1	1	0	2	1	3	0	0	15
Other Academic Dept.	2	1	0	7	3	14	12	4	4	4	5	0	56
Research Institute/Other Nonprofit	5	1	0	0	2	12	2	4	0	5	0	0	31
Government	0	7	2	1	6	8	5	5	0	1	0	0	35
Business and Industry	8	6	12	11	5	63	18	17	6	13	0	1	160
Non-U.S. Academic	19	13	13	10	4	18	7	5	1	11	0	0	101
Non-U.S. Nonacademic	1	0	1	0	4	5	2	1	0	3	0	0	17
Not Seeking Employment	3	2	3	1	0	1	0	0	0	1	0	0	11
Still Seeking Employment	13	8	6	3	4	10	9	1	0	5	0	0	59
Unknown (U.S.)	16	5	14	10	9	45	11	7	4	8	3	0	132
Unknown (non-U.S.)*	4	5	6	3	1	23	5	3	0	3	0	1	54
<b>Column Total</b>	<b>169</b>	<b>105</b>	<b>132</b>	<b>90</b>	<b>51</b>	<b>269</b>	<b>100</b>	<b>79</b>	<b>23</b>	<b>98</b>	<b>14</b>	<b>3</b>	<b>1133</b>
<b>Column Subtotals</b>													
Male	123	81	99	67	34	173	70	59	18	80	9	2	815
Female	46	24	33	23	17	96	30	20	5	18	5	1	318

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

**Table 3B: Employment Status of 1998–99 U.S. New Doctoral Recipients in the Mathematical Sciences by Type of Degree-Granting Department**

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	23	10	2	0	2	82	60	22
Group I (Private)	17	28	3	1	1	4	54	43	11
Group II	23	6	23	3	1	2	58	42	16
Group III	8	0	4	10	5	0	27	19	8
Group IV	1	1	0	2	43	2	49	29	20
Group Va	2	2	1	0	1	11	17	14	3
Master's	13	3	19	11	3	0	49	36	13
Bachelor's	31	12	48	25	6	4	126	83	43
Two-Year College	4	1	6	3	0	1	15	12	3
Other Academic Dept.	7	5	14	12	11	7	56	39	17
Research Institute/Other Nonprofit	6	6	2	1	11	5	31	22	9
Government	5	1	12	4	10	3	35	23	12
Business and Industry	28	19	23	19	57	14	160	122	38
Non-U.S. Academic	38	19	17	2	19	6	101	78	23
Non-U.S. Nonacademic	4	2	3	1	7	0	17	14	3
Not Seeking Employment	0	4	2	3	1	1	11	6	5
Still Seeking Employment	19	5	14	7	9	5	59	42	17
Unknown (U.S.)	25	12	29	25	39	2	132	87	45
Unknown (non-U.S.)*	16	3	11	5	19	0	54	44	10
<b>Column Total</b>	<b>292</b>	<b>152</b>	<b>241</b>	<b>136</b>	<b>243</b>	<b>69</b>	<b>1133</b>	<b>815</b>	<b>318</b>
<b>Column Subtotals</b>									
Male	214	114	175	103	156	53	815		
Female	78	38	66	33	87	16	318		

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

**Table 3C: 1998-99 New Doctoral Recipients: Field of Thesis by Type of Degree-Granting Department**

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/Approximations	Linear Nonlinear Optim./Control	Differential, Integral, & Difference Equations	Math. Education	Other/Unknown	
Group I (Public)	69	41	52	31	13	6	19	24	4	31	0	2	292
Group I (Private)	41	18	33	14	7	5	10	11	0	13	0	0	152
Group II	43	34	41	21	13	6	20	21	10	30	1	1	241
Group III	16	12	6	17	5	17	18	12	5	15	13	0	136
Group IV	0	0	0	1	9	231	2	0	0	0	0	0	243
Group Va	0	0	0	6	4	4	31	11	4	9	0	0	69
<b>Total</b>	<b>169</b>	<b>105</b>	<b>132</b>	<b>90</b>	<b>51</b>	<b>269</b>	<b>100</b>	<b>79</b>	<b>23</b>	<b>98</b>	<b>14</b>	<b>3</b>	<b>1133</b>

**Employment Status of U.S. New Doctoral Recipients, 1998-99**

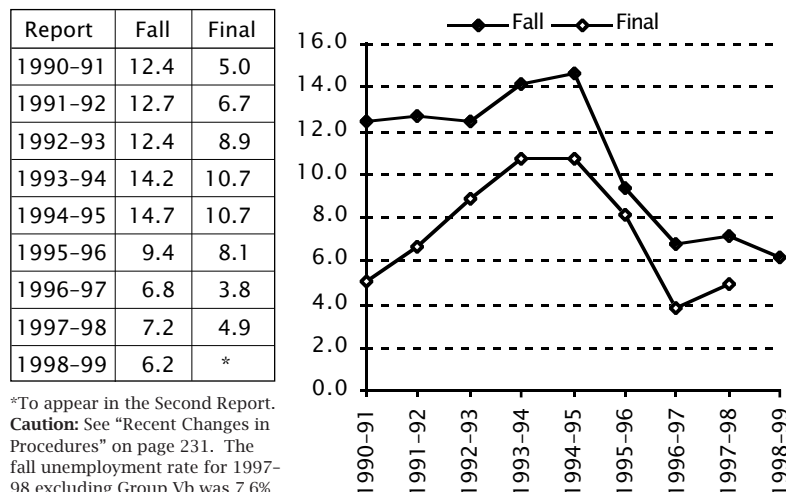
Table 3A gives a cross-tabulation of the 1,133 new doctoral recipients in the mathematical sciences: Type of Employer by Field of Thesis. Table 3B gives a cross-tabulation of the same data: Type of Employer by Type of Degree-Granting Department (Group). Table 3C gives a cross-tabulation of these same data: Type of Degree-Granting Department (Group) by Field of Thesis. This table gives a picture of the type of doctoral students being trained in the various groups. These tables contain a wealth of information about the employment of these new doctoral recipients, some of which will be discussed in this report. Keep in mind the results in this report come from the departments giving the degrees and not from the recipients themselves.

The last column (Total) in Table 3A can be used to find the overall unemployment rate. In this and other unemployment calculations in this report, the individuals whose employment status is not known (Unknown (U.S.) and Unknown (non-U.S.)) are first removed, and the unemployment fraction is the number still seeking employment divided by the total number of in-

dividuals left after the "Unknowns" are removed. The overall unemployment rate for these data is 6.2%. The analogous figure for fall 1998, with Vb doctoral recipients removed, is 7.6%. This figure will be updated with information gathered from the individual new doctoral recipients in the Second Report of the Annual Survey in a summer 2000 issue of the *Notices*. Table/Graph 4A shows how this employment rate compares with other years in the 1990s. Table/Graph 4E gives the unemployment rate for each of the doctoral-granting groups for fall 1998 and fall 1999.

There are 759 new doctoral recipients employed in the U.S. Of these, 564 (74.3%) hold academic positions, 35 (4.6%) are employed by government, and 160 (21.1%) hold positions in business and industry. In the First Report for fall 1998, with the Group Vb degree recipients removed, there were 763 new doctoral recipients employed in the U.S., of which 501 (65.7%) held academic positions, 43 (5.6%) were in government, and 219 (28.7%) were in business and industry.

**Table/Graph 4A: Percentage of New Doctoral Recipients Unemployed (as reported in the respective Annual Survey Reports 1991-99)**



\*To appear in the Second Report. **Caution:** See "Recent Changes in Procedures" on page 231. The fall unemployment rate for 1997-98 excluding Group Vb was 7.6%.

**Table 4B: Number of New Doctoral Recipients Taking Positions in Business and Industry by Type of Degree-Granting Department, Fall 1998 and Fall 1999**

Group	I (Pu)	I (Pr)	II	III	IV	Va	Total
Fall 1998	29	27	41	27	70	25	219
Fall 1999	28	19	23	19	57	14	160

The number of new doctoral mathematicians taking jobs in business and industry has been rising for several years, so the drop from 219 in fall 1998 to 160 in fall 1999 represents a big reversal. Table 4B shows the number of new doctoral recipients who took positions in business and industry by the type of department granting their degree for fall 1998 and fall 1999. The number of new doctoral recipients taking jobs in business and industry is down in fall 1999 compared to fall 1998 for every type of doc-

toral-granting department. The number in Group IV, statistics departments, is down by 13 even though the number of new doctoral recipients in Group IV is up by 30.

Table 4C shows the number of new doctoral recipients who took academic positions in the U.S. by type of department granting their degree for fall 1998 and fall 1999. We see that the increase in number of new doctoral recipients taking U.S. academic jobs is almost the same as the decrease in those taking jobs in business and industry.

**Table 4C: Number of New Doctoral Recipients Taking U.S. Academic Positions by Type of Degree-Granting Department, Fall 1998 and Fall 1999**

Group	I (Pu)	I (Pr)	II	III	IV	Va	Total
Fall 1998	117	97	122	49	84	32	501
Fall 1999	157	87	130	70	82	38	564

Table 4C shows where the new doctoral recipients came from to fill the U.S. academic positions. Table 4D shows how many positions were filled with new doctoral recipients for each type of academic employer.

**Table 4D: U.S. Academic Positions Filled by New Doctoral Recipients by Type of Hiring Department, Fall 1998 and Fall 1999**

Group	I-III	IV	Va	M&B	Other	Total
Fall 1998	177	35	7	177	105	501
Fall 1999	221	49	17	175	102	564

In 1999, 72 new doctoral recipients hold positions in the institution that granted their de-

gree, although not necessarily in the same department. This represents 8.2% of new doctoral recipients who are currently employed and 12.8% of the U.S. academic positions held by new doctorates. In 1998 there were 58 such individuals making up 6.5% of the new doctorates who were employed at the time of the First Report. Twenty-one new doctoral recipients have taken part-time positions in 1999.

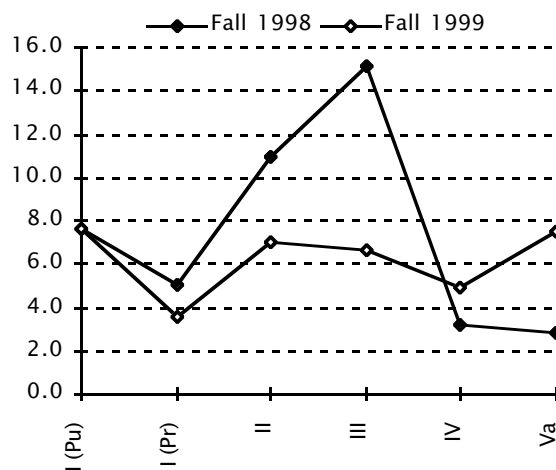
**Information about Females among the New Doctoral Recipients, 1998-99**

Tables 3A and 3B give male and female breakdowns of the new doctoral recipients in 1998-99 by Field of Thesis, by Type of Degree-Granting Department, and by Type of Employer.

Overall, 318 (28.1%) of the 1,133 new doctoral recipients in 1998-99 are females. In 1997-98, 283 (24.3%) of the new doctoral recipients were females. This percentage varies over the different groups, and these percentages are given in the first row of Table 4G. The percentage is lowest for Group Va, applied mathemat-

**Table/Graph 4E: Percentage of Unemployed New Doctoral Recipients by Type of Degree-Granting Department, Fall 1998 and Fall 1999**

%	I (Pu)	I (Pr)	II	III	IV	Va
Fall 1998	7.6	5.0	11.0	15.1	3.2	2.8
Fall 1999	7.6	3.6	7.0	6.6	4.9	7.5



**Table 4F: Employment Status of 1998-99 U.S. New Doctoral Recipients by Citizenship Status**

TYPE OF EMPLOYER	CITIZENSHIP				TOTAL DOCTORAL RECIPIENTS
	U.S. CITIZENS	NON-U.S. CITIZENS			
		Permanent Visa	Temporary Visa	Unknown Visa	
U.S. Employer	430	65	243	21	759
U.S. Academic	335	48	168	13	564
Groups I, II, III, and Va	123	16	93	6	238
Group IV	20	11	15	3	49
Non-Ph.D. Department	179	18	46	3	246
Research Institute/Other Nonprofit	13	3	14	1	31
U.S. Nonacademic	95	17	75	8	195
Non-U.S. Employer	19	3	87	9	118
Non-U.S. Academic	14	1	80	6	101
Non-U.S. Nonacademic	5	2	7	3	17
Not Seeking Employment	5	0	6	0	11
Still Seeking Employment	29	2	27	1	59
SUBTOTAL	483	70	363	31	947
Unknown (U.S.)	70	19	35	8	132
Unknown (non-U.S.)*	1	1	40	12	54
TOTAL	554	90	438	51	1133

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

ics departments, at 23.2%, and highest for Group IV, statistics departments, at 35.8%. The second row of Table 4G gives the percentage of the new doctoral recipients hired who are female for each of the Groups I-Va. In addition, 26.5% of the new doctoral recipients hired in Group M, master's departments, are female; 34.1% of the new doctoral recipients hired in Group B, bachelor's departments, are female; and 23.8% of new doctoral recipients hired in business and industry are female.

**Table 4G: Percentage of Female New Doctoral Recipients Produced by and Hired by Doctoral-Granting Groups, 1998-99**

%	I (Pu)	I (Pr)	II	III	IV	Va	Total
Produced	26.7	25.0	27.4	24.3	35.8	23.2	28.1
Hired	26.8	20.4	27.6	29.6	40.8	17.6	27.9

The unemployment rate for all female new doctoral recipients is 6.5% compared to 6.1% for males and 6.2% overall.

By field of thesis the percentage of female new doctoral recipients ranged from a low of 18.4% in differential, integral, and difference equations to a high of 35.7% in statistics.

The last section in this First Report gives more information about the female new doctoral recipients who are U.S. citizens.

**Employment Information about New Doctoral Recipients by Citizenship and Type of Employer**

Table 4F shows the pattern of employment within broad job categories broken down by citizenship status of the new doctoral recipients. The citizenship is known for all 1,133 new doctoral recipients in 1998-99.

The unemployment rate for the 554 U.S. citizens is 6.0% compared to 8.2% in 1997-98. The

unemployment rate for non-U.S. citizens is 6.5%. This varies by type of visa. The unemployment rate for non-U.S. citizens with a permanent visa is 2.9%, while that for non-U.S. citizens with a temporary visa is 7.4%.

Among U.S. citizens whose employment status is known, 89.0% are employed in the U.S. Among non-U.S. citizens with a permanent visa whose employment status is known, 92.9% have jobs in the U.S., while this percentage for non-U.S. citizens with a temporary visa is 66.9%.

**Table 4H: New Doctoral Recipients Having Employment in the U.S. by Type of Employer and Citizenship**

Employer	U.S.	Non-U.S.	Total
U.S. Academic, Groups I-Va	143	144	287
U.S. Academic, Other	192	85	277
U.S. Nonacademic	95	100	195
Total	430	329	759

Table 4H is a cross-tabulation of the 759 new doctoral recipients who have employment in the U.S. by citizenship and broad employment categories. It is a condensation of Table 4F.

Of the 759 new doctoral recipients having jobs in the U.S., 56.7% are U.S. citizens. Of the 287 new doctoral recipients who took jobs in U.S. doctoral-granting departments, 49.8% are U.S. citizens. Of the 277 who took other academic positions, 69.3% are U.S. citizens. Of the 195 who took nonacademic positions, 48.7% are U.S. citizens.

Of the 430 U.S. citizens employed in the U.S., 33.3% have jobs in a doctoral-granting department, 44.7% are in other academic positions, and 22.1% are in nonacademic positions. For the 329 non-U.S. citizens employed in the U.S., the analogous percentages are 43.8%, 25.8%, and 30.4% respectively.

**Table 5: Sex, Race/Ethnicity, and Citizenship Status of 1998-99 U.S. New Doctoral Recipients**

RACIAL/ETHNIC GROUP	MALE					FEMALE					TOTAL
	U.S. CITIZEN	NON-U.S. CITIZEN			Total Male	U.S. CITIZEN	NON-U.S. CITIZEN			Total Female	
		Permanent Visa	Temporary Visa	Unknown Visa			Permanent Visa	Temporary Visa	Unknown Visa		
American Indian or Alaska Native	1	1	5	0	7	0	0	0	0	0	7
Asian	12	24	179	26	241	6	13	54	8	81	322
Black or African American	5	1	5	0	11	7	1	0	0	8	19
Hispanic or Latino	8	1	22	2	33	4	2	5	0	11	44
Native Hawaiian or Other Pacific Islander	1	2	0	0	3	0	0	0	0	0	3
White	336	32	135	11	514	170	11	32	3	216	730
Unknown	4	1	1	0	6	0	1	0	1	2	8
TOTAL	367	62	347	39	815	187	28	91	12	318	1133

**Table 6: U.S. Citizen Doctoral Recipients**

	Total Doctorates by U.S. Institutions	Total U.S. Citizen Doctoral Recipients	%
1978-79	806	596	74
1979-80	791	578	73
1980-81	839	567	68
1981-82	798	519	65
1982-83	744	455	61
1983-84	738	433	59
1984-85	726	396	55
1985-86	755	386	51
1986-87	739	362	49
1987-88	798	363	45
1988-89	884	411	46
1989-90	929	401	43
1990-91	1061	461	43
1991-92	1016	430	42
1992-93	1197	526	44
1993-94	1059	469	44
1994-95	1207	567	47
1995-96	1150	493	43
1996-97	1158	516	45
1997-98*	1216	586	48
1998-99	1133	554	49

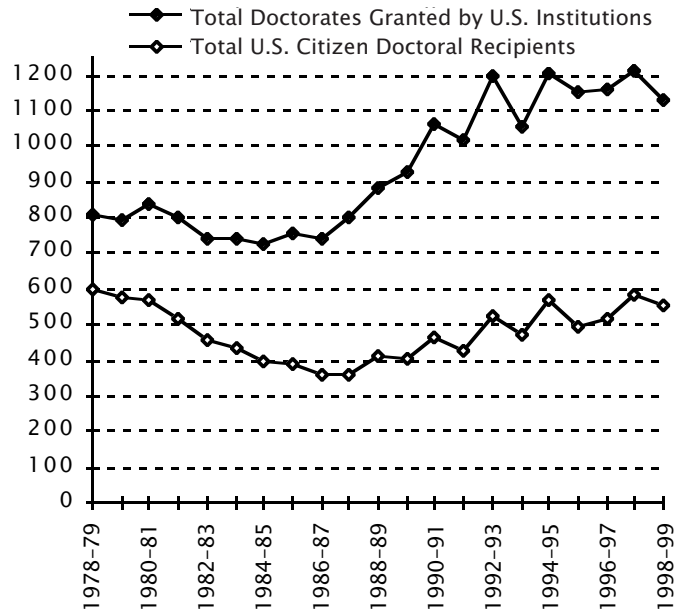
\*Prior to this year, the counts include new doctoral recipients from Group Vb. The figures for 1997-98 excluding Vb are 1,163 new doctoral recipients, of which 565 are U.S. citizens. In addition, prior to 1982-83, the counts include new doctoral recipients from computer science departments.

**Table 7: U.S. Citizen Doctoral Recipients by Sex**

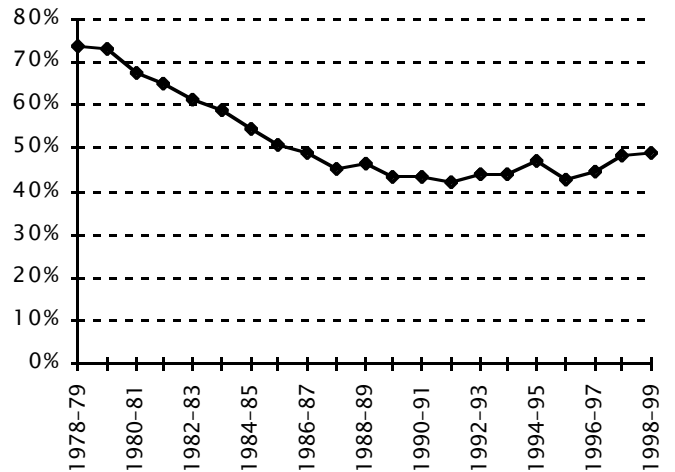
	Total U.S. Citizen Doctoral Recipients	Male	Female	% Female
1978-79	596	503	93	16
1979-80	578	491	87	15
1980-81	567	465	102	18
1981-82	519	431	88	17
1982-83	455	366	89	20
1983-84	433	346	87	20
1984-85	396	315	81	20
1985-86	386	304	82	21
1986-87	362	289	73	20
1987-88	363	287	76	21
1988-89	411	313	98	24
1989-90	401	312	89	22
1990-91	461	349	112	24
1991-92	430	327	103	24
1992-93	526	381	145	28
1993-94	469	345	124	26
1994-95	567	426	141	25
1995-96	493	377	116	24
1996-97	516	368	148	29
1997-98*	586	423	163	28
1998-99	554	367	187	34

\*Prior to this year, the counts include new doctoral recipients from Group Vb. The figures for 1997-98 excluding Vb are 565 U.S. citizen new doctoral recipients, of which 409 are male and 156 are female. In addition, prior to 1982-83, the counts include new doctoral recipients from computer science departments.

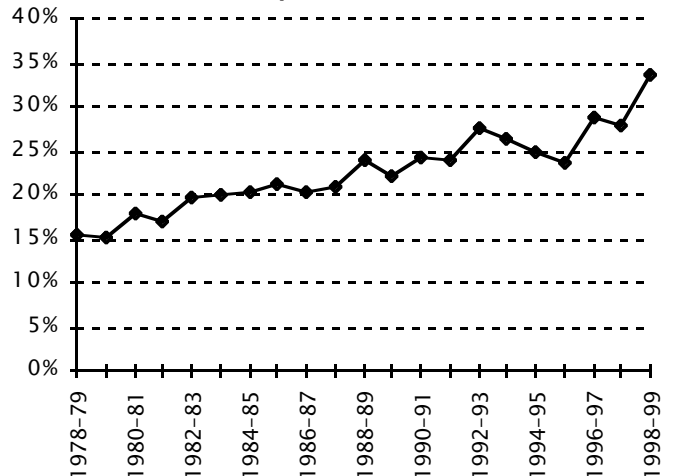
**Graph 6A: U.S. Citizen Doctoral Recipients**



**Graph 6B: U.S. Citizen Doctoral Recipients by Percent**



**Graph 7: Female U.S. Citizen Doctoral Recipients by Percent**



### Sex, Race/Ethnicity, and Citizenship Status of U.S. New Doctoral Recipients, 1998–99

Table 5 presents a breakdown according to sex, racial/ethnic group, and citizenship status of new doctoral recipients. The information reported in this table was obtained in summary form from the departments granting the degrees.

There were 554 (48.9%) U.S. citizens among the 1,133 new doctoral recipients in 1998–99.

### 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*.<sup>1</sup> These rankings update those reported in a previous study published in 1982.<sup>2</sup> 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 Web site at [www.ams.org/employment/](http://www.ams.org/employment/).*

<sup>1</sup>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.

<sup>2</sup>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

This is the highest percentage of U.S. citizens since 1986–87. Table 6 gives the number of new U.S. doctorates and the number of U.S. citizens back to 1978–79. The percentage of U.S. citizens in 1997–98 was 48.6%.

Among U.S. citizens, 18 are Asians (12 male and 6 female), 12 are Blacks or African Americans (5 male and 7 female), 12 are Hispanics or Latinos (8 male and 4 female), 506 are whites (336 male and 170 female), and 6 are other. Among non-U.S. citizens, there are 304 Asians, 32 Hispanics or Latinos, 224 whites, and 19 others.

Females make up 33.8% of the 554 U.S. citizens receiving doctoral degrees in the mathematical sciences in 1998–99. This compares to 27.6% in 1997–98. The highest previous percentage of females among U.S. citizen new doctoral recipients was 28.7% in 1996–97. The 187 female new U.S. citizen doctoral recipients is also the largest number ever recorded. The 187 females is 31 higher than 156 in 1997–98, even though the total number of new doctoral recipients reported in 1998–99 is 30 less than was reported in the 1997–98 First Report. This is a very substantial change. For comparison, among the 579 non-U.S. citizen new doctoral recipients, 131 (22.6%) are females. Among all new doctoral recipients 28.1% are females.

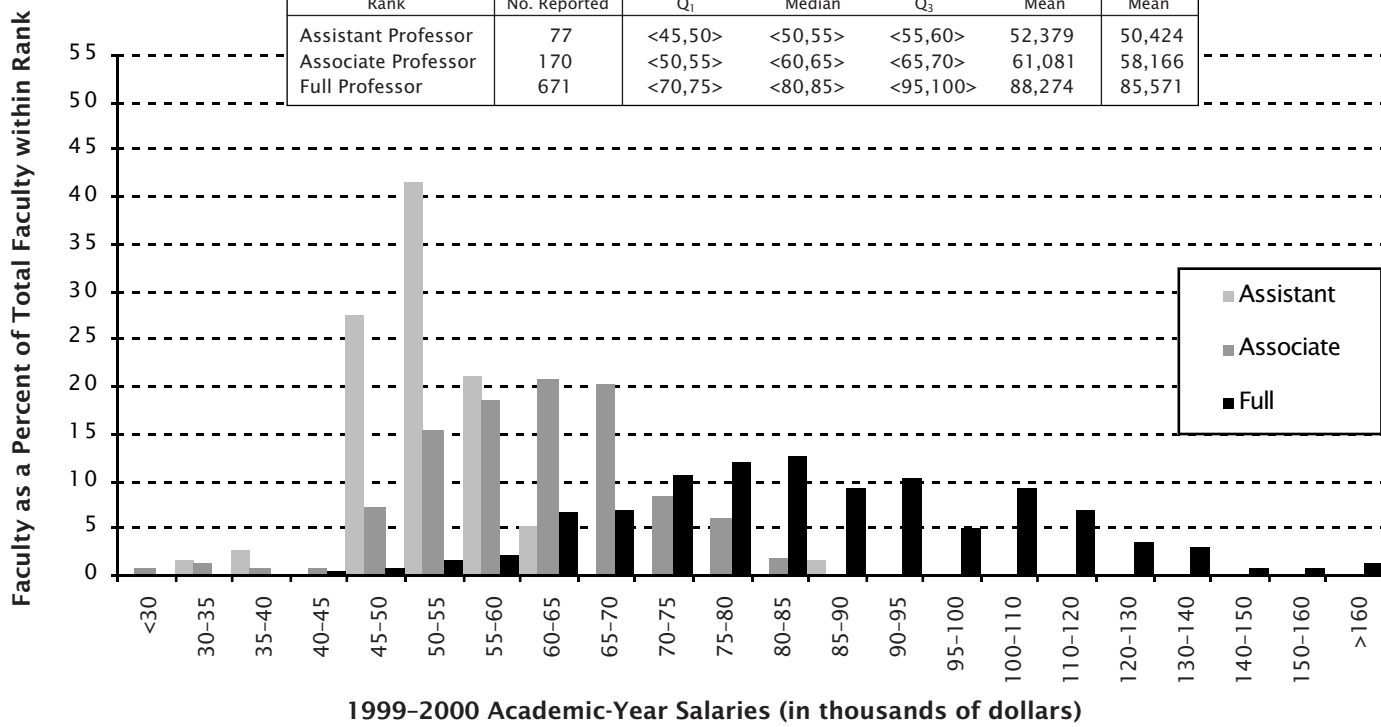
At the same time, the number of male new U.S. citizen doctorates decreased by 42 from 1997–98. Table 7 gives the historical record of U.S. citizen new doctorates, broken down by male and female for past years, going back to 1978–79.

## Salary Survey for Faculty

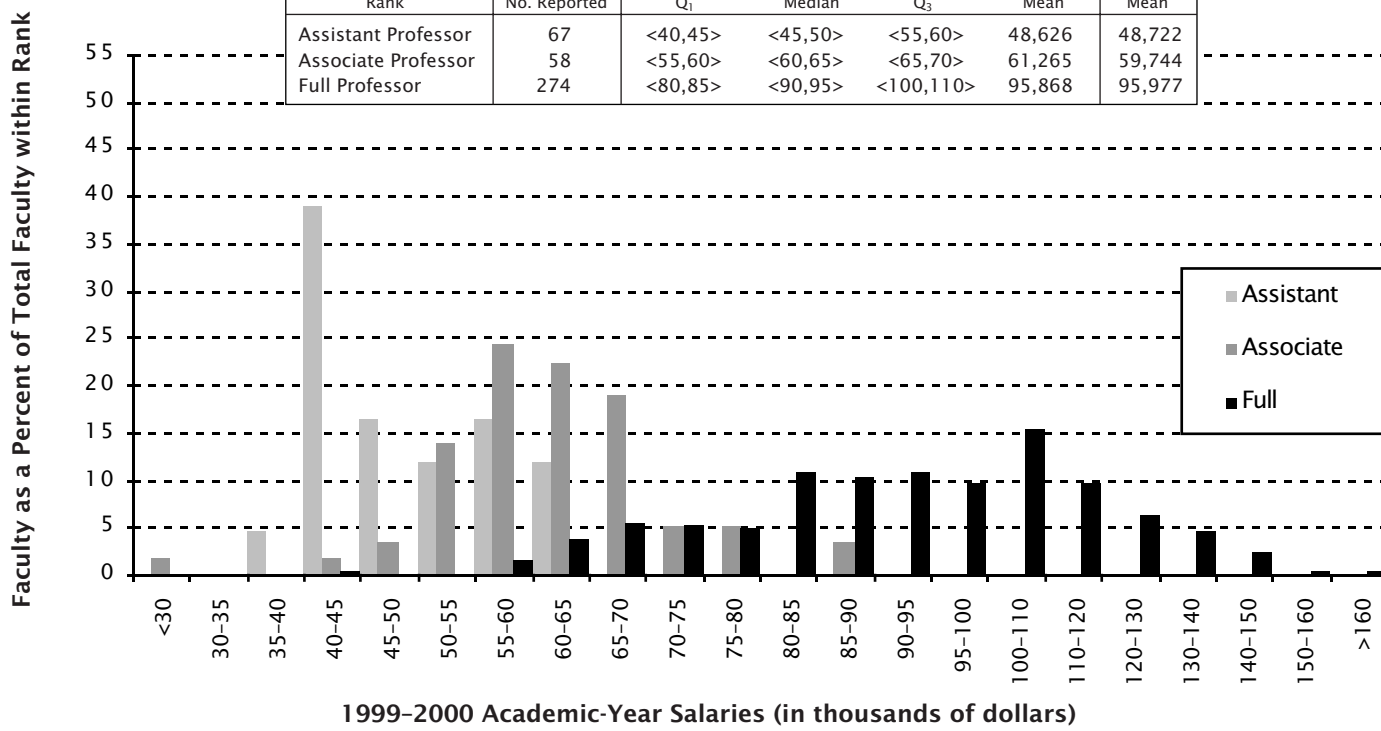
The charts on the following pages display faculty salary data for Groups I (Public), I (Private), II, III, IV, Va, M, and B: faculty salary distribution by rank, mean salaries by rank, information on quartiles by rank, and the number of returns for the group. Since groupings used for the mathematics departments in this year’s report differ from years prior to 1995–96, comparisons are possible only to the last three years’ data. In addition, prior to the 1998 survey, Groups Va and Vb were reported together as Group V. Departments were asked to report for each rank the number of tenured and tenure-track faculty whose 1999–2000 academic-year salaries fell within given salary intervals. Reporting salary data in this fashion eliminates some of the concerns about confidentiality but does not permit determination of actual quartiles. What can be determined is the salary interval in which the quartiles occur; the salary intervals containing the quartiles are denoted by <n, n+5>.



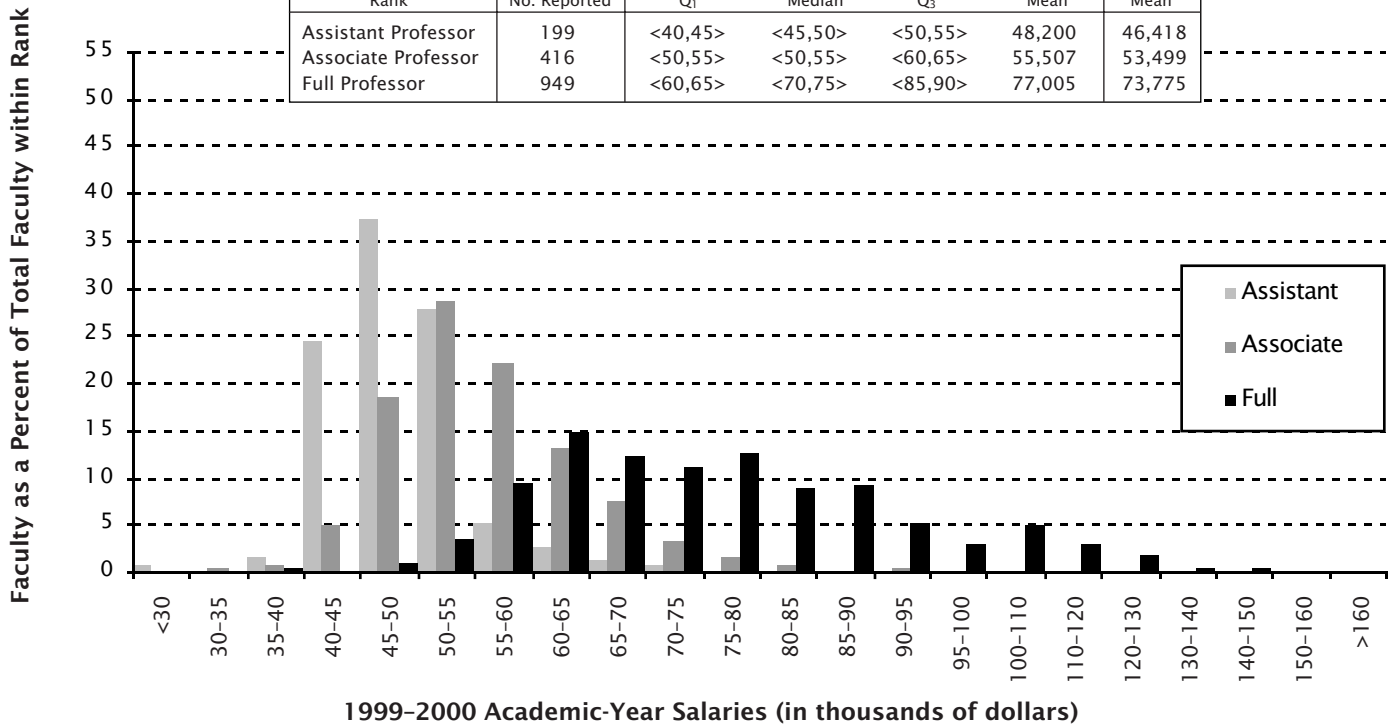
Group I (Public) Faculty Salaries						
Doctoral degree-granting departments of mathematics (25)						
20 responses (80%)						
Rank	1999-2000					1998-99 Mean
	No. Reported	Q <sub>1</sub>	Median	Q <sub>3</sub>	Mean	
Assistant Professor	77	<45,50>	<50,55>	<55,60>	52,379	50,424
Associate Professor	170	<50,55>	<60,65>	<65,70>	61,081	58,166
Full Professor	671	<70,75>	<80,85>	<95,100>	88,274	85,571



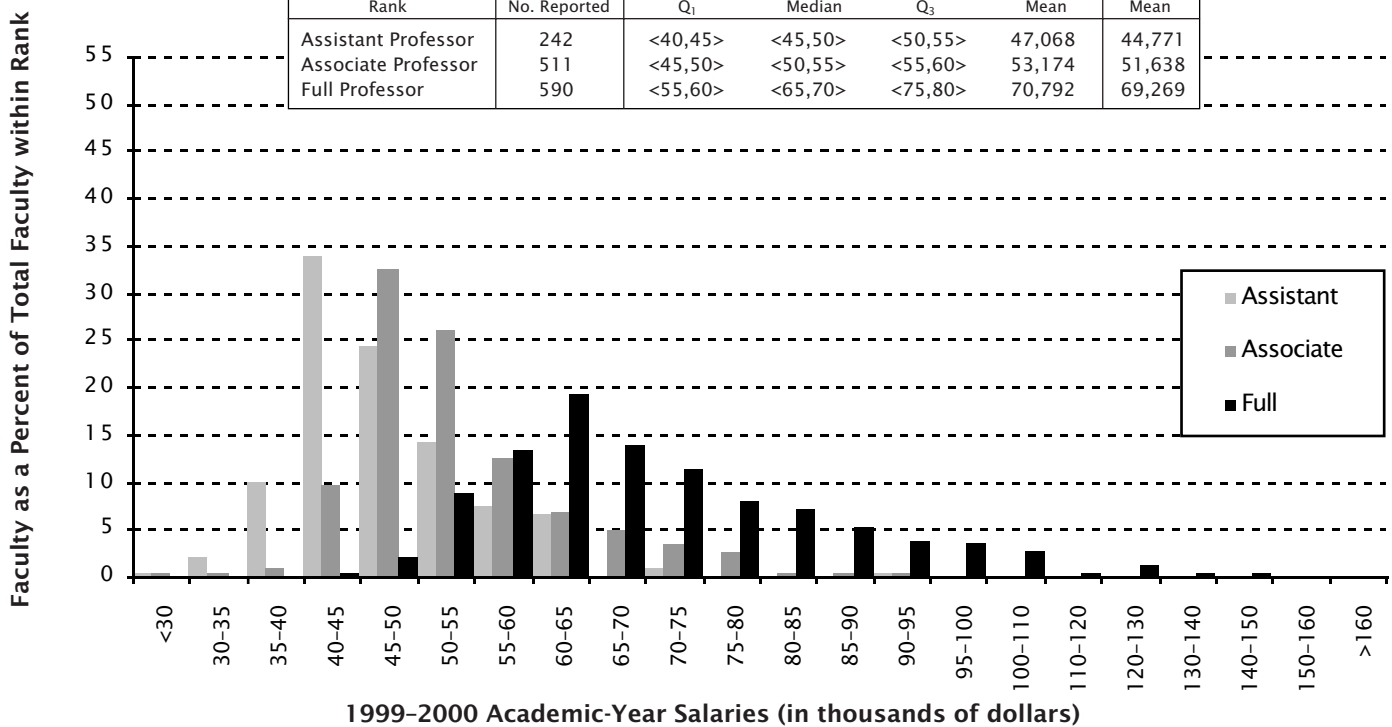
Group I (Private) Faculty Salaries						
Doctoral degree-granting departments of mathematics (23)						
15 responses (65%)						
Rank	1999-2000					1998-99 Mean
	No. Reported	Q <sub>1</sub>	Median	Q <sub>3</sub>	Mean	
Assistant Professor	67	<40,45>	<45,50>	<55,60>	48,626	48,722
Associate Professor	58	<55,60>	<60,65>	<65,70>	61,265	59,744
Full Professor	274	<80,85>	<90,95>	<100,110>	95,868	95,977



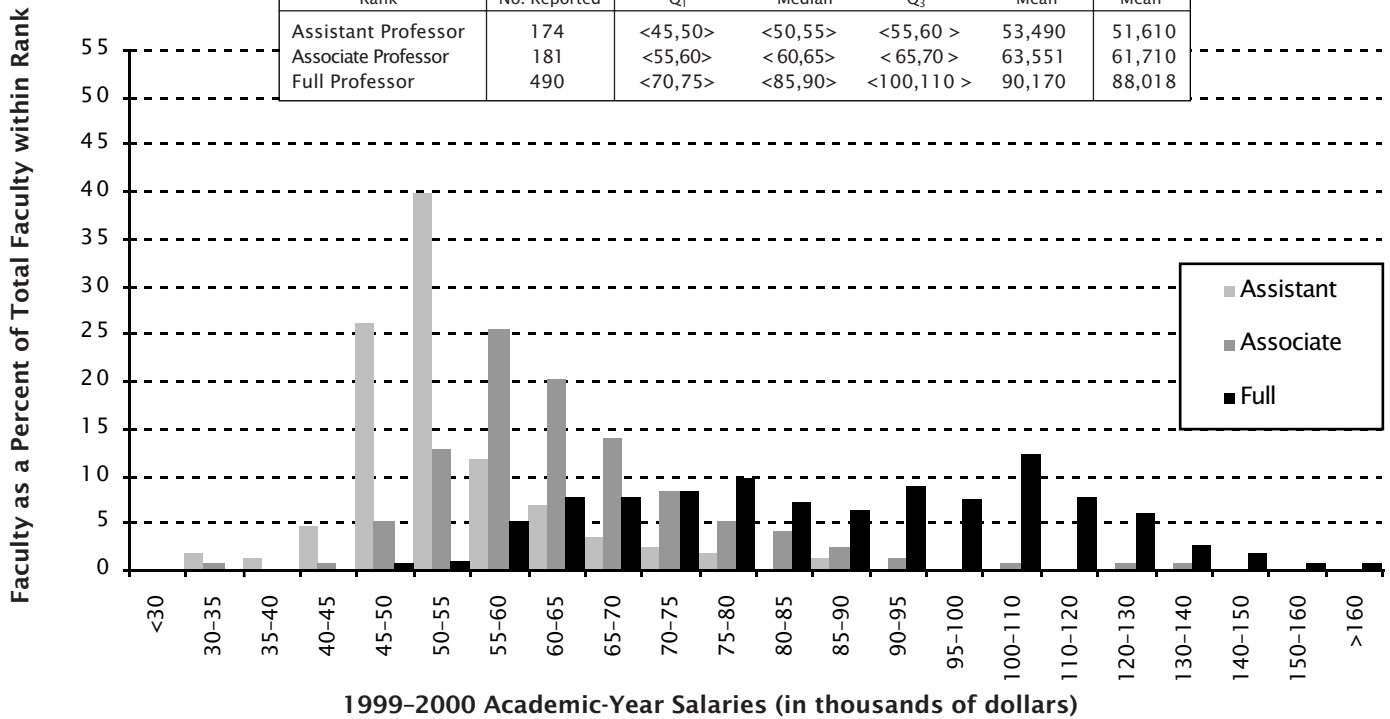
Group II Faculty Salaries						
Doctoral degree-granting departments of mathematics (56)						
47 responses (84%)						
Rank	1999-2000					1998-99
	No. Reported	Q <sub>1</sub>	Median	Q <sub>3</sub>	Mean	Mean
Assistant Professor	199	<40,45>	<45,50>	<50,55>	48,200	46,418
Associate Professor	416	<50,55>	<50,55>	<60,65>	55,507	53,499
Full Professor	949	<60,65>	<70,75>	<85,90>	77,005	73,775



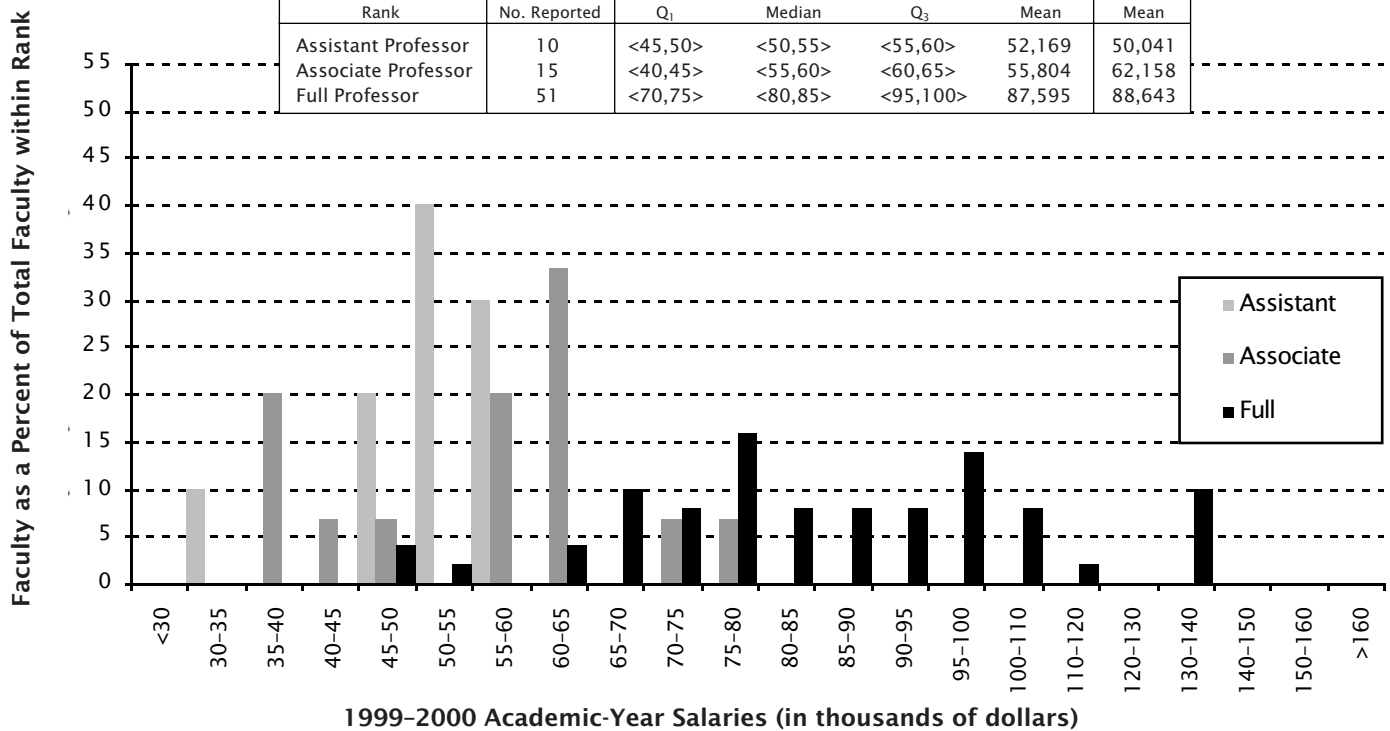
Group III Faculty Salaries						
Doctoral degree-granting departments of mathematics (73)						
62 responses (85%)						
Rank	1999-2000					1998-99
	No. Reported	Q <sub>1</sub>	Median	Q <sub>3</sub>	Mean	Mean
Assistant Professor	242	<40,45>	<45,50>	<50,55>	47,068	44,771
Associate Professor	511	<45,50>	<50,55>	<55,60>	53,174	51,638
Full Professor	590	<55,60>	<65,70>	<75,80>	70,792	69,269



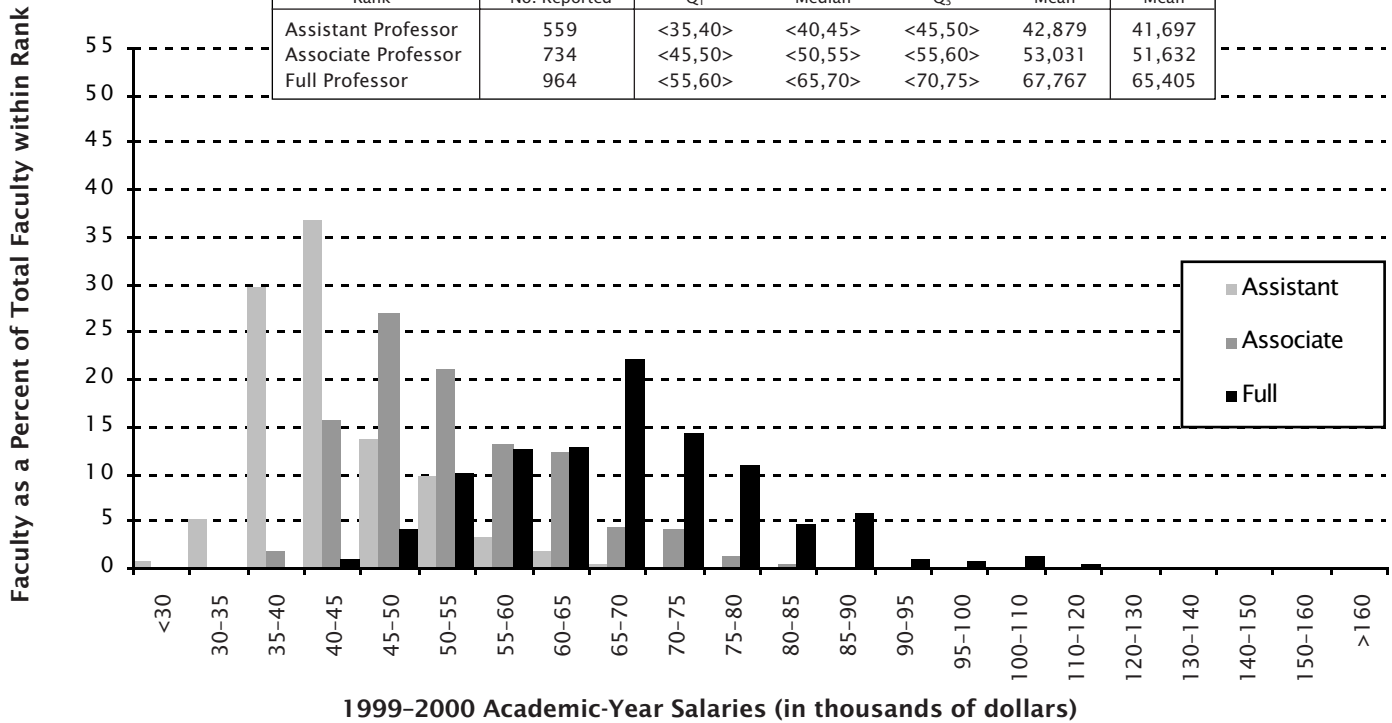
Group IV Faculty Salaries						
Doctoral degree-granting departments of statistics, biostatistics, biometrics (91)						
57 responses (63%)						
Rank	1999-2000					1998-99 Mean
	No. Reported	Q <sub>1</sub>	Median	Q <sub>3</sub>	Mean	
Assistant Professor	174	<45,50>	<50,55>	<55,60 >	53,490	51,610
Associate Professor	181	<55,60>	< 60,65>	< 65,70 >	63,551	61,710
Full Professor	490	<70,75>	<85,90>	<100,110 >	90,170	88,018



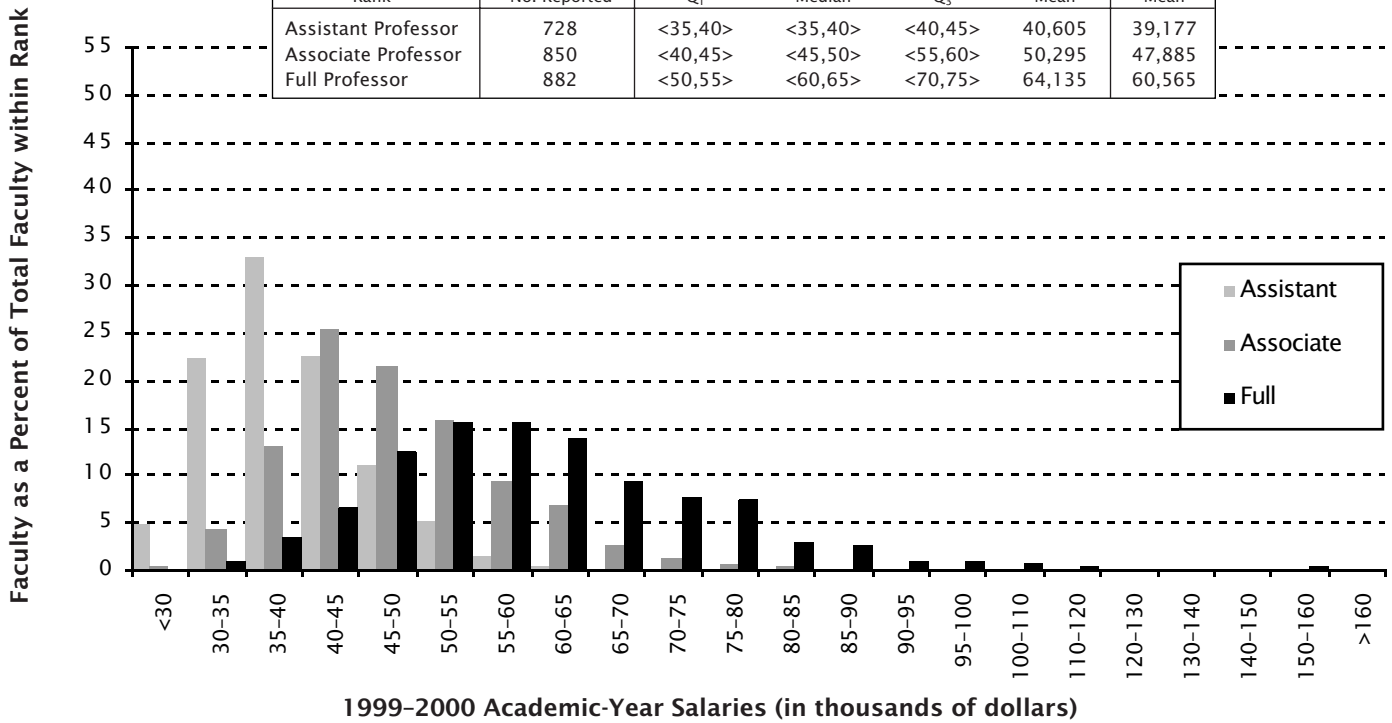
Group Va Faculty Salaries						
Doctoral degree-granting departments of applied mathematics (19)						
6 responses (32%)						
Rank	1999-2000					1998-99 Mean
	No. Reported	Q <sub>1</sub>	Median	Q <sub>3</sub>	Mean	
Assistant Professor	10	<45,50>	<50,55>	<55,60>	52,169	50,041
Associate Professor	15	<40,45>	<55,60>	<60,65>	55,804	62,158
Full Professor	51	<70,75>	<80,85>	<95,100>	87,595	88,643



Group M Faculty Salaries						
Master's degree-granting departments of mathematics (231)						
123 responses (53%)						
Rank	1999-2000					1998-99
	No. Reported	Q <sub>1</sub>	Median	Q <sub>3</sub>	Mean	Mean
Assistant Professor	559	<35,40>	<40,45>	<45,50>	42,879	41,697
Associate Professor	734	<45,50>	<50,55>	<55,60>	53,031	51,632
Full Professor	964	<55,60>	<65,70>	<70,75>	67,767	65,405



Group B Faculty Salaries						
Bachelor's degree-granting departments of mathematics (1,011)						
357 responses (35%)						
Rank	1999-2000					1998-99
	No. Reported	Q <sub>1</sub>	Median	Q <sub>3</sub>	Mean	Mean
Assistant Professor	728	<35,40>	<35,40>	<40,45>	40,605	39,177
Associate Professor	850	<40,45>	<45,50>	<55,60>	50,295	47,885
Full Professor	882	<50,55>	<60,65>	<70,75>	64,135	60,565



## 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

- D. O. Loftsgaarden, D. C. Rung, and A. E. Watkins, Statistical abstract of undergraduate programs in the mathematical sciences in the U.S., *Fall 1995 CBMS Survey*, MAA Reports No. 2, 1997.
- American Association of University Professors. Doing Better: The annual report on the economic status of the profession 1997-1998, *Academe: Bulletin of the AAUP* (March/April 1998), Washington, DC.
- American Mathematical Society Task Force on Excellence. *Towards Excellence: Leading a Doctoral Mathematics Department in the 21st Century*, J. Ewing, editor, 1999.
- W. G. Bowen and N. L. Rudenstine, *In Pursuit of the Ph.D.*, Princeton Univ. Press, Princeton, NJ, 1992.
- Commission on Professionals in Science and Technology, Occasional Papers, prepared by Betty M. Vetter. Supply and demand for engineers in the 1990s (90-1), April 1990; Who is in the pipeline? Science, math, and engineering education (90-2), July 1990; Recruiting doctoral scientists and engineers for the twenty-first century (90-3), October 1990; Women in science and engineering, an illustrated progress report (90-4), December 1990; Recruiting and retaining a diverse, quality technical work force (91-1), April 1991; By the year 2000: Myths and facts (91-2), July 1991; Cultural diversity in higher education (91-3), October 1991; Supply and demand in science and engineering (91-4), January 1992; American minorities in science and engineering (92-1), April 1992; Foreign citizens among U.S. scientists and engineers (92-2), July 1992; What's holding up the glass ceiling? Barriers in the work force (92-3), October 1992; Setting the record straight: Shortages in perspective (92-4), January 1993; CPST, Washington, DC.
- , Salaries of scientists, engineers, and technicians: A summary of salary surveys, 18th ed., Washington, DC, October 1998.

- , Professional women and minorities—1994, Washington, DC, 1994.
- , *Preparing for the 21st Century: Human Resources in Science and Technology*, Proceedings of a Symposium, March 26-27, 1992, Washington, DC, 1992.
- A. Jackson, Top producers of women mathematics doctorates, *Notices of the AMS*, September 1991.
- B. Madison and T. A. Hart, *A Challenge of Numbers: People in the Mathematical Sciences*, National Academy Press, Washington, DC, 1990.
- D. E. McClure, Academic hiring survey, 1991-1992, *Notices of the AMS*, April 1992.
- , Employment experiences of 1990-1991 U.S. institution doctoral recipients in the mathematical sciences, *Notices of the AMS*, July 1995.
- National Research Council, *Summary Report 1996, Doctorate Recipients from U. S. Universities*, National Academy Press, Washington, DC, 1998.
- , *Moving Beyond Myths: Revitalizing Undergraduate Mathematics*, National Academy Press, Washington, DC, 1991.
- , *Everybody Counts: A Report to the Nation on the Future of Mathematics Education*, National Academy Press, Washington, DC, 1989.
- , *Renewing U.S. Mathematics: A Plan for the 1990s*, National Academy Press, Washington, DC, 1990.
- National Science Board, Science and engineering indicators—1998, National Science Foundation, Arlington, VA, 1998 (NSB 98-1).
- National Science Foundation, Science and technology pocket data book, NSF 96-324, Arlington, VA, 1996.
- , Science and engineering degrees: 1966-95, NSF 97-335, Arlington, VA, 1997.
- , Science and engineering doctorate awards: 1996, NSF 97-329, Detailed Statistical Tables, Arlington, VA, 1997.
- , Academic science and engineering: Graduate enrollment and support, 1991, NSF 93-309, Detailed Statistical Tables, Washington, DC, 1993.
- , Selected data on graduate students and postdoctorates in science and engineering, Fall 1993, NSF 95-316; Selected Pamphlet No. 11: Institutional listings, NSF 90-324-11; Selected Pamphlet No. 12: Postdoctorates and other nonfaculty research staff, NSF 90-324-12; Washington, DC, 1990.
- , Survey of mathematics and statistics departments at higher education institutions, Higher Education Surveys Report, Survey Number 5, Washington, DC, December 1990.
- , Foreign participation in U.S. academic science and engineering: 1991, NSF 93-302, Washington, DC, 1993.