

# 2002 Annual Survey of the Mathematical Sciences

*(Third Report)*

Faculty Profile

Enrollment and Undergraduate Degrees/Majors Profile

Graduate Student Profile

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## 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 935 of this report. Departments in the former Group Vb are no longer surveyed. We present information about the faculties and instructional programs at the undergraduate and graduate levels in these departments for the 2002–2003 academic year. For 1999–2000 and earlier years, these data were presented as part of the Second Report.

Information about departments was gathered on a questionnaire called the Departmental Profile. This questionnaire was mailed to all departments in Groups I, II, III, IV, and Va and to stratified random samples from Groups M and B. The percentage of the departments responding in each of the doctoral groups was greater than 94 percent. Prior to 2001, if doctoral departments did not respond, simple projections were made to the whole population using the data from those departments who did respond. Beginning last year, if a department did not return the Departmental Profile questionnaire but had returned one within the last three years, the data from the most recent questionnaire was used. This change in procedure will produce even more accurate results than those in past reports for these doctoral departments.

The Departmental Profile questionnaire is mailed to a stratified random sample of departments drawn

This Third Report of the 2002 Annual Survey gives 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. Prior to 2000, these data were included as part of the Second Report.

The 2002 Annual Survey represents the forty-sixth in an annual series begun in 1957 by the American Mathematical Society. The 2002 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 Kinda Remick Priestley and survey coordinator Colleen Rose. Comments or suggestions regarding this Survey Report may be directed to the committee.

from each of Groups M and B, and standard statistical projections are made using the data from the respondents. The stratification for Groups M and B is based on the enrollment of the school and whether it is a public or a private school. For the second year, standard errors are reported for several of the more important projections made in Groups M and B. The box on page 926 discusses these standard errors in more detail.

The careful reader will note that a row or column total may differ slightly from the sum of the individual entries. All the table entries are the rounded

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## Highlights

- The estimated total number of full-time doctoral positions under recruitment in Groups I, II, III, Va, M, and B combined is down to 1,867 from 2,314 last year (a drop of 19%). Of these 1,867 full-time positions, 1,320 were tenured/tenure-track, down from 1,618 last year (a drop of 18%). Of the 1,320 full-time tenured/tenure-track doctoral positions, 1,124 were open to new doctorates, down from 1,459 last year (a drop of 23%).
- The estimated total number of full-time doctoral positions filled with a doctoral hire in Groups I, II, III, Va, M, and B combined is down to 1,319 from 1,621 last year (a drop of 19%). Groups I, II, III, and Va combined filled 593 doctoral positions, of which 254 (43%) were tenured/tenure-track positions. Groups M and B combined filled 725 doctoral positions, of which 528 (73%) were tenured/tenure-track. Last year Groups I, II, III, and Va combined filled 666 doctoral positions, of which 281 (42%) were tenured/tenure-track positions, and Groups M and B combined filled an estimated 955 doctoral positions, of which 681 (71%) were tenured/tenure-track.
- The estimated number of new doctoral hires into tenured/tenure-track positions was up in Groups I, II, III, and Va combined (79 from 59 last year), and about the same in Groups M and B combined (258 from 259 last year). But the estimated number of not new doctoral hires into tenured/tenure-track positions was down in both Groups I, II, III, and Va combined (175 from 222 last year) and in Groups M and B combined (270 from 422 last year, a 36% drop over last year).
- The total number of full-time faculty in Groups I, II, III, Va, M, and B combined is estimated at 20,007, with a standard error of 269; this total is up 295 from last year. The number of full-time faculty having doctorates in this total is estimated at 16,430, up from 16,374 last year. The number of full-time doctoral non-tenure-track faculty in this total is estimated at 2,057, up from 1,920 last year. The size of the standard error makes it possible that the changes observed are due to sampling error.
- The number of female full-time faculty in Groups I, II, III, Va, M, and B combined is estimated at 5,019, up from 4,795 last year. The number of nondoctoral full-time faculty is estimated at 3,577, up from 3,338 last year. The estimated number of part-time doctoral faculty in this total is 7,771, down from 8,057 last year. Detailed information is given in this report about these groups.
- The number of junior/senior mathematics majors in Groups I, II, III, Va, M, and B is estimated at 64,800 in 2002 (the highest since 1995), up 5,900 over the estimated 58,900 in 2001.
- The estimated number of full-time graduate students in Groups I, II, III, Va, and M combined increased to 12,647 from 12,127 last year. The estimated numbers of graduate students in Groups I, II, III, and Va combined who are first year, who are female, who are male, who are U.S. citizens, and who are non-U.S. citizens all were up over last year. The estimated number of first-year graduate students in Group M dropped from 1,236 to 1,012; however, the standard errors for the Group M estimates are large, making estimates vary simply due to the sampling variability rather than any real change.

## Remarks on Statistical Procedures

This report is based on information gathered from departments of mathematical sciences in the U.S., separated into groups by highest degree granted as defined on page 935. Groups for doctoral-granting departments are I (Public), I (Private), II, III, IV, and Va. Groups M and B consist of those departments offering master's and bachelor's degrees respectively.

While the questionnaire on which this report is based is sent to every doctoral department, it is sent to a stratified random sample in Group M and B departments.

The response rate is typically between 90 and 100 percent for the doctoral groups. Prior to last year, simple projections were made using the questionnaires that were returned to get estimated totals for the entire population. After a couple of years of experimentation, a new procedure was begun for the 2001 survey. If a doctoral department did not return its questionnaire this year but had returned one within the past three years, those numbers were used as its response for the current year. This procedure will give us even more accurate estimates than we have gotten in the past.

The stratified random sampling procedures used for Groups M and B were put in place four years ago. Beginning last year, standard errors were calculated for some of the key estimates. Standard errors are calculated using the variability in the data and can be used to crudely measure how closely our estimate is to the true value for the population. As an example, the number of full-time faculty in Group M is estimated at 4,342, with a standard error of 121. This means the actual number of full-time faculty in Group M is most likely between 4,342 plus or minus two standard errors, or between 4,100 and 4,584. This is much more informative than simply giving the estimate of 4,342.

Estimates are also given for parameters that are totals from all groups, such as the total number of full-time faculty. The values given for the doctoral groups are assumed to be the true parameters for these groups, because they are not sampled and hence are not subject to sampling variability. The only variability in a total of several groups comes from the sampling for Groups M and B. Using the standard errors for M and B, it is possible to calculate a standard error for the total. For example, an estimate of the total number of full-time faculty in all groups but group IV is 20,007, with a standard error of 269.

Standard errors, when calculated for an estimate, appear in the tables in parentheses underneath the estimate.

Table 1: Faculty Attrition,<sup>1</sup> Fall 2002

	GROUP									
	I Public	I Private	II	III	Va	I, II, III, & Va	M	B	I, II, III, Va, M, & B	IV
<b>Full-time faculty who retired or died</b>										
Total number (Standard error)	34	9	69	42	7	162	135 (16)	310 (90)	607 (92)	39
Percentage	1.9	1.0	2.9	2.0	2.3	2.2	3.1	3.8	3.0	2.8

<sup>1</sup> Number and percentage of full-time faculty who were in the department in fall 2001 but were reported to have retired or died by fall 2002.

values of the individual projections associated with each entry, and the differences are the result of this rounding (as the sum of rounded numbers is not always the same as the rounded sum).

## Faculty Profile

The Departmental Profile, sent in fall 2002 to mathematical sciences departments at four-year colleges and universities as part of the Annual Survey, gathered information about faculties at these schools, which is reported in this section. The 2002 First Report presented data collected earlier about faculty salaries (pages 238–53 of the February 2003 issue of the *Notices of the AMS*.)

### Faculty Attrition

Table 1 displays losses of full-time mathematical sciences faculty due to retirements and deaths. The fall 2002 mathematics faculty attrition rate for Groups I, II, III, Va, M, and B combined was 3.0%. Figure 1 shows the trend in the attrition rate for these departments during the years 1987 to 2002.

Figure 1: Percent of Full-Time Doctoral Faculty Who Retired or Died in Groups I, II, III, Va, M, &amp; B, Fall 1987 to Fall 2002

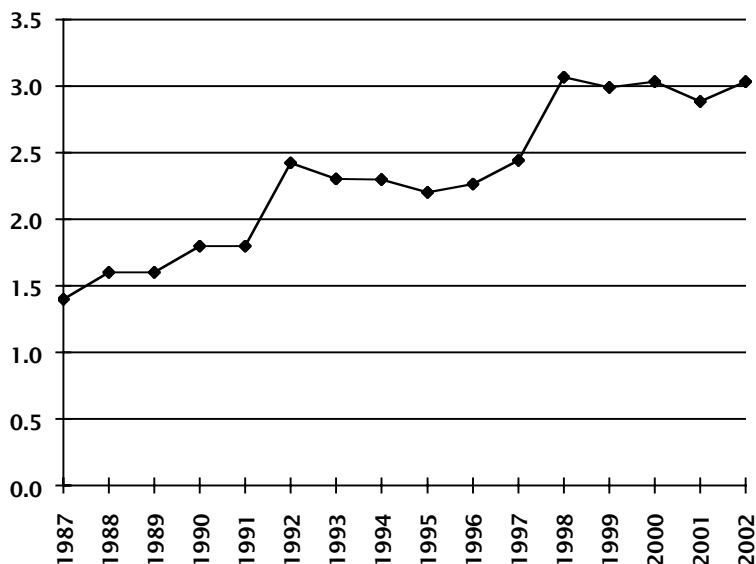


Table 2A: Recruitment of Doctoral Faculty, Fall 2002

	GROUP									
	I Public	I Private	II	III	Va	I, II, III, & Va	M	B	I, II, III, Va, M, & B	IV
<b>Posted Doctoral Positions</b>										
<b>Total number</b> <sup>1</sup>	200	117	188	189	31	726	349	793	1867	169
(Standard error)							(42)	(60)	(73)	
Tenured/tenure-track	77	33	112	145	18	386	313	621	1320	141
Open to new doctoral recipients	146	87	156	174	25	587	311	771	1670	121
Tenured/tenure-track	33	10	86	129	15	272	278	573	1124	108
Open at assoc/full level	39	25	40	48	7	159	60	97	317	59
<b>Reported Hires for Above</b>										
<b>Total number</b>	174	101	161	151	23	611	290	598	1499	110
Male doctoral hires	143	78	114	112	16	464	170	349	983	65
Tenured/tenure-track	42	18	60	73	7	201	151	217	569	53
Female doctoral hires	30	22	43	30	4	129	73	133	335	45
Tenured/tenure-track	7	1	22	22	1	53	65	95	213	34
Male temporary hires	0	1	3	5	3	13	16	81	110	0
Female temporary hires	0	0	1	4	0	5	30	34	70	0
Total new doctoral hires	103	64	71	59	12	309	102	212	624	58
Male new doctoral hires	83	47	56	45	10	241	79	136	455	29
Tenured/tenure-track	1	2	21	34	4	63	76	96	235	25
Female new doctoral hires	21	17	15	14	2	69	24	76	168	29
Tenured/tenure-track	0	0	7	8	0	16	22	64	101	23
<b>Unfilled positions</b>	26	16	27	38	7	115	58	195	368	59

<sup>1</sup> Number of full-time doctoral positions under recruitment in 2001–2002 to be filled for 2002–2003.

After a significant increase from 1997 to 1998, the overall rate has remained relatively stable over the last five years. However, the rates vary quite a bit from group to group and from year to year within each of the groups. For fall 2002, Group I Private had the lowest attrition rate at 1.0%, while Group B the highest at 3.8%.

### Faculty Recruitment

Table 2A contains detailed information on the number of full-time doctoral faculty positions in mathematical sciences departments under recruitment in 2001-2002 for employment beginning in the academic year 2002-2003. Among mathematics departments (Groups I, II, III, Va, M, and B), 1,867 positions were under recruitment in 2001-2002 for employment beginning in the academic year 2002-2003, down 19% compared to last year. Of

those 1,867 positions, 1,670 (89%) were available to new doctoral recipients, and of those 1,670 positions, 1,124 (67%) were tenured/tenure-track positions. The 1,124 tenured/tenure-track positions open to new doctoral recipients was down 23% from the 1,459 such positions under recruitment in 2000-2001; the biggest drop was in Groups M and B, where the total number of tenured/tenure-track positions open to new doctoral recipients dropped from 1,192 last year to 851 this year (a 29% drop). The total number of tenured/tenure-track full-time doctoral positions under recruitment in Groups I, II, III, Va, M, and B combined is 1,320, down from last year's 1,618 (a drop of 18%). In Groups I, II, III, and Va combined, the total number of posted doctoral positions open at the associate/full level rose from 138 last year to 159 this year.

Table 2B condenses the information in Table 2A. It also reorganizes the doctoral hires into one section for new doctoral hires and another for other doctoral hires (so excludes posted doctoral positions that were temporarily filled with a person without a doctorate). Table 2C is derived from Table 2B with the percentage of the filled positions that were tenured/tenure-track included in the table.

From Table 2B we find that the total number of full-time doctoral positions filled in Groups I, II, III, Va, M, and B combined is down to 1,319 from 1,621 last year (a drop of 19%). Groups I, II, III, and Va combined filled 593 doctoral positions, of which 254 (43%) were tenured/tenure-track positions. Groups M and B combined filled 725 doctoral positions, of which 528 (73%) were tenured/tenure-track. Last year Groups I, II, III, and Va combined filled 666 doctoral positions, of which 281 (42%) were tenured/tenure-track positions, and Groups M and B combined filled 955 doctoral positions, of which 681 (71%) were tenured/tenure-track.

The number of tenured/tenure-track new doctoral hires was up in Groups I, II, III, and Va combined (79 from 59 last year), and about the same in Groups M and B combined (258 from 259 last year). But the number of tenured/tenure-track not new doctoral hires was down in both Groups I, II, III, and Va combined (175 from 222 last year) and in Groups M and B combined (270 from 422 last year, a 36% drop over last year).

From Tables 2B and 2C we can compare the hiring patterns of Groups I, II, III, and Va with that of Groups M and B. In Groups I, II, III, and Va 52% of the positions hired went to new doctoral recipients (last year 47%), while in Groups M and B 43% of the positions hired went to new doctoral recipients (last year 40%). In Groups I, II, III, and Va only 26% of the hires of new doctoral recipients were in tenured/tenure-track positions (last year it was 19%), while in Groups M and B 82% of the hires were in tenured/tenure-track positions (last year it was 69%).

**Table 2B: A Summary of Recruitment of Doctoral Faculty, Fall 2002**

	GROUP		
	I, II, III, & Va	M & B	IV
<b>Posted Doctoral Positions</b>			
<b>Total number</b>	<b>726</b>	<b>1142</b>	<b>169</b>
Tenured/tenure-track	386	934	141
Open to new doctoral recipients	587	1082	121
Tenured/tenure-track	272	851	108
<b>Reported Hires for Above</b>			
<b>Total new doctoral hires</b>	<b>309</b>	<b>314</b>	<b>58</b>
Tenured/tenure-track	79	258	48
Male	241	215	29
Tenured/tenure-track	63	172	25
Female	69	100	29
Tenured/tenure-track	16	86	23
<b>Total not new doctoral hires</b>	<b>284</b>	<b>411</b>	<b>52</b>
Tenured/tenure-track	175	270	39
Male	223	304	36
Tenured/tenure-track	138	196	28
Female	60	106	16
Tenured/tenure-track	37	74	11

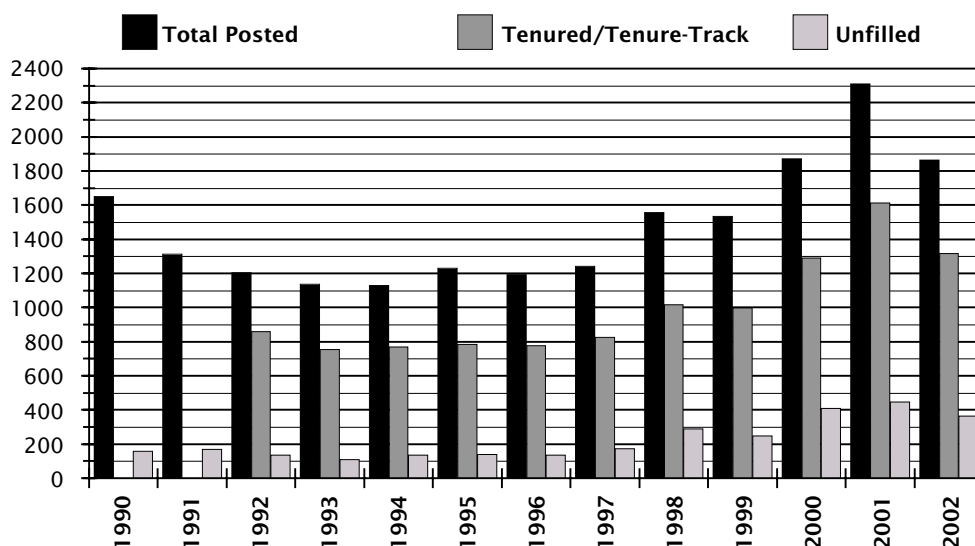
**Table 2C: Percentage Tenured/Tenure-Track for Positions Posted and Filled, Fall 2002**

	GROUP		
	I, II, III, & Va	M & B	IV
<b>New Doctoral Positions</b>			
Positions posted	587	1082	121
% tenured/tenure-track	46	79	89
Positions filled	309	314	58
% tenured/tenure-track	25	82	83
<b>Not New Doctoral Positions</b>			
Positions posted <sup>1</sup>	-	-	-
% tenured/tenure-track	-	-	-
Positions filled	284	411	52
% tenured/tenure-track	62	66	75

<sup>1</sup> The current survey requests the number of positions posted and the number open to new doctoral recipients. As some positions are open to both new and not new doctoral recipients, there is no way to use the data collected to identify positions open to not new doctoral recipients only.

From Table 2B we find that of the new doctoral recipients hired in Groups I, II, III, and Va combined, 26% of the males and 23% of the females took tenured/tenure-track positions. For new doctoral recipients hired in Groups M and B combined, 80% of the males and 86% of the females took tenured/tenure-track positions. Even though 46% of the positions available in doctoral departments (Groups I, II, III, and Va) for new doctoral recipients were tenure-track positions, only 26% of the new doctoral recipients hired were given tenured/tenure-track positions. At the same time, 284 of those hired were not new doctoral recipients and 62% had tenured/tenure-track positions.

**Figure 2: Number of Full-Time Doctoral Positions under Recruitment: Total, Tenured/Tenure-Track, and Unfilled in Groups I, II, III, Va, M, & B Combined, Fall 1990 to Fall 2002**



Note: The tenured/tenure-track status of positions under recruitment was not surveyed until 1992.

**Table 3A: Total Faculty Size, Fall 2002**

	GROUP									
	I Public	I Private	II	III	Va	I, II, III, & Va	M	B	I, II, III, Va, M, & B	IV
<b>Total full-time faculty</b> <i>(Standard error)</i>	1752	949	2422	2068	320	7511	4342 <i>(121)</i>	8154 <i>(240)</i>	20007 <i>(269)</i>	1397
Doctoral full-time faculty	1693	945	2179	1764	309	6890	3464	6076	16430	1355
Tenured	1163	536	1567	1292	182	4740	2361	3858	10959	812
Untenured, tenure-track	162	97	269	314	34	876	827	1711	3414	308
Non-tenure-track <i>(Standard error)</i>	368	312	343	158	93	1274	276 <i>(62)</i>	507 <i>(71)</i>	2057 <i>(94)</i>	235
Nondoctoral full-time faculty	59	4	243	304	11	621	878	2078	3577	42
<b>Total part-time faculty</b> <i>(Standard error)</i>	222	57	443	747	35	1504	2150 <i>(175)</i>	4117 <i>(254)</i>	7771 <i>(309)</i>	172

**Table 3B: Female Faculty Size, Fall 2002**

	GROUP									
	I Public	I Private	II	III	Va	I, II, III, & Va	M	B	I, II, III, Va, M, & B	IV
<b>Female full-time faculty</b> <i>(Standard error)</i>	219	100	422	451	46	1238	1277 <i>(62)</i>	2504 <i>(115)</i>	5019 <i>(131)</i>	354
Doctoral full-time faculty	181	99	279	274	39	872	811	1473	3156	332
Tenured	87	26	114	147	18	392	452	791	1635	125
Untenured, tenure-track	27	12	57	86	4	186	252	500	938	110
Non-tenure-track	67	61	108	41	17	294	107	182	583	97
Nondoctoral full-time faculty	38	1	143	177	6	365	467	1031	1863	23
<b>Female part-time faculty</b>	85	11	175	251	8	530	810	1855	3195	63

Table 3C: Number and Percentage of Full-Time Faculty, Fall 2002

	GROUP								TOTAL
	I Public	I Private	II	III	Va	M	B	IV	
<b>Full-Time Faculty</b>									
Number	1752	949	2422	2068	320	4342	8154	1397	21403
Percentage of total full-time faculty	8	4	11	10	1	20	38	7	100
<b>Female Full-Time Faculty</b>									
Number	219	100	422	451	46	1277	2504	354	5373
Percentage of female full-time faculty	4	2	8	8	1	24	47	7	100
<b>Female Full-Time Faculty</b> Percentage female full-time faculty by group	13	11	17	22	14	29	31	25	25

Table 3D: Number, and Percentage of Those Female, of Non-tenure-track Doctoral Full-Time Faculty and Part-Time Faculty by Group, Fall 1996 to Fall 2002

	1996	1997	1998	1999	2000	2001	2002
<b>Groups I, II, III, &amp; Va</b>							
Non-tenure-track doctoral full-time faculty	672	708	904	1014	993	1233	1274
Percentage female	25	22	21	22	20.6	21	23
Part-time faculty	1093	954	1141	1217	1399	1467	1504
Percentage female	37	37	38	38	37	38	35
<b>Group M</b>							
Non-tenure-track doctoral full-time faculty	138	216	140	146	262	183	276
Percentage female	24	30	27	56	29	24	39
Part-time faculty	1879	1612	1768	1906	2323	2393	2150
Percentage female	41	46	43	35	36	37	38
<b>Group B</b>							
Non-tenure-track doctoral full-time faculty	419	385	427	514	407	504	507
Percentage female	23	26	31	24	30	29	36
Part-time faculty	3055	3107	3585	3298	3580	4197	4117
Percentage female	44	46	42	41	40	43	45

Figure 2 shows the number of full-time doctoral positions available in all groups except Group IV, as well as the number of those that were tenured/tenure-track and the number unfilled for the years 1990 to 2002. There was a sharp decrease in available positions in the first few years of the 1990s, but the number of positions and the number of tenured/tenure-track positions had been increasing steadily until this year.

#### Faculty Size

Table 3A gives the number of faculty for different categories of faculty broken down by group. Table 3B gives the same information for females only. The estimated total number of full-time faculty in Groups I, II, III, Va, M, and B combined is 20,007, up 295 from last year, with a standard error of 269. We can be quite confident that the actual total number of faculty in these groups is in the interval 20,007  $\pm$  538. The doctoral departments I, II, III, and Va were up 79 full-time faculty members, Group M was up 6 faculty members, and Group B was up 210. Since the standard errors for the total number of full-time faculty in Groups M

and B are 121 and 240 respectively, there may not be an actual change, as these increases are well within the variability we expect with standard errors of 121 and 240.

Table 3C gives some percentages based on the information in Tables 3A and 3B.

The number of non-tenure-track doctoral full-time faculty and the number of part-time faculty have been increasing in recent years, though this year the estimated number of part-time faculty is down to 7,771 from 8,057 last year. Table 3D gives a seven-year history of these two types of faculty for Groups I, II, III, and Va combined; for Group M; and for Group B. Also shown for each number in this table is the percentage of females. Table 3D shows that over the last seven years, the percentage in non-tenure-track doctoral full-time faculty has increased by 90% in Groups I, II, III, and Va; 100% in Group M; and 21% in Group B, and the percentage of part-time faculty has increased in these groups 38%, 14%, and 35%, respectively. This increase in non-tenure-track full-time doctoral positions continues a disturbing trend highlighted in "Staffing shifts in mathematical sciences

departments, 1990–2000” (David J. Lutzer and James W. Maxwell, *Notices of the AMS*, June/July 2003, pages 683–6).

Table 3E gives a summary of the various types of faculty found in departments of mathematical sciences by sex and group.

Tables 3F and 3G give more information about two types of faculty: full-time faculty without a doctorate and part-time faculty. The top half of Table 3F is a somewhat condensed version of the doctoral full-time faculty in Table 3A broken down by sex. The bottom half of Table 3F shows this same information for the 3,576 full-time faculty who do not have doctoral degrees. The majority of these faculty, 2,956 (83%), are found in Group M and B departments. Table 3G shows the part-time faculty broken down by sex and whether they have a doctoral degree.

#### Faculty Profile for Females

Table 3B gives a complete breakdown of all categories of female faculty by group and shows increasing estimated numbers of female faculty in most categories. The estimated total number of full-time faculty in all groups for 2002–2003 is 21,403, of which 5,373 (25%) are females, up from 5,135 (24%) last year. In the B group doctoral female faculty dropped to 1,473 from 1,527 last year, tenured female faculty dropped from 870 last year to 791 this year, and non-tenure-track doctoral female faculty rose from 147 last year to 182 this year. In the M group non-tenure-track female doctoral faculty rose from 43 last year to 107 this year.

Table 3C shows the number and percentage of all full-time and female full-time faculty that fall in each group for 2002–2003. The number of faculty in each group and the percentage who are female are given in the bottom section of Table 3C. The number of females as a percentage of full-time faculty varies considerably among the groups, from 11% for Group I Private to 31% for Group B. This is the same pattern as reported last year. Note: In Table 3C the percentages for each group in rows 2 and 4 are of the row totals. The percentages in row 6 are column percentages using the numbers in rows 1 and 3.

Table 3D contains information about non-tenure-track doctoral full-time faculty and part-time

**Table 3E: Summary of Full-Time and Part-Time Faculty by Sex, Fall 2002**

	GROUP					
	I, II, III, & Va		M & B		IV	
	Male	Female	Male	Female	Male	Female
<b>Full-time faculty</b>	<b>6273</b>	<b>1238</b>	<b>8714</b>	<b>3781</b>	<b>1043</b>	<b>354</b>
Percentage	84	16	70	30	75	25
Doctoral full-time faculty	6018	872	7256	2284	1023	332
Percentage	87	13	76	24	76	24
Tenured	4348	392	4977	1243	687	125
Percentage	92	8	80	20	85	15
Untenured, tenure-track	690	186	1786	752	199	110
Percentage	79	21	70	30	64	36
Non-tenure-track	980	294	493	289	137	97
Percentage	77	23	63	37	59	41
Nondoctoral full-time faculty	255	365	1459	1497	19	23
Percentage	41	59	49	51	46	54
<b>Part-time faculty</b>	<b>973</b>	<b>530</b>	<b>3602</b>	<b>2665</b>	<b>109</b>	<b>63</b>
Percentage	65	35	57	43	63	37

**Table 3F: Doctoral and Nondoctoral Full-Time Faculty Size, Fall 2002**

	GROUP					
	I, II, III, & Va		M & B		TOTAL	
	Male	Female	Male	Female	Male	Female
<b>Doctoral full-time faculty</b>	<b>6018</b>	<b>872</b>	<b>7256</b>	<b>2284</b>	<b>13274</b>	<b>3156</b>
Tenured	4348	392	4977	1243	9325	1635
Untenured, tenure-track	690	186	1786	752	2476	938
Non-tenure-track	980	294	493	289	1473	583
<b>Nondoctoral full-time faculty</b>	<b>255</b>	<b>365</b>	<b>1459</b>	<b>1497</b>	<b>1714</b>	<b>1862</b>
Tenured	19	10	483	337	502	347
Untenured, tenure-track	5	2	172	244	177	246
Non-tenure-track	231	353	803	916	1034	1269

faculty for the years 1997 to 2002 for Groups I, II, III, and Va combined, M, and B. This table includes the total number for each category as well as the percentage female for each number.

Table 3E gives the male/female breakdown by count and percentage for Groups I, II, III, and Va combined for various categories of faculty in columns 2 and 3. The same breakdowns are given for Groups M and B combined in columns 4 and 5 and for Group IV in columns 6 and 7.

**Table 3G: Part-Time Faculty Size, Fall 2002**

	GROUP				
	I, II, III, & Va		M & B		TOTAL
	Male	Female	Male	Female	
Doctoral part-time faculty	400	130	834	331	<b>1695</b>
Nondoctoral part-time faculty	573	400	2768	2334	<b>6075</b>
<b>TOTAL</b>	<b>973</b>	<b>530</b>	<b>3602</b>	<b>2665</b>	<b>7771</b>

**Table 4A: Undergraduate and Graduate Enrollments (thousands), Fall 2002**

	GROUP									
	I Public	I Private	II	III	Va	I, II, III, & Va	M	B	IV	TOTAL
<b>Undergraduate Course Enrollments</b> Total number (thousands) (Standard error)	187	41	275	250	16	<b>768</b>	507 (16)	774 (22)	76	<b>2125</b> (27)
<b>Graduate Course Enrollments</b> Total number (thousands)	10	4	11	10	3	<b>38</b>	12	-	29	<b>79</b>

**Table 4B: Total Undergraduate Enrollments (thousands), Fall 1997 to Fall 2002**

	GROUP								
	I Public	I Private	II	III	Va	M	B	IV	TOTAL
1997	173	42	247	220	24 <sup>1</sup>	561	701	69	<b>2037</b>
1998	182	43	258	214	20 <sup>1</sup>	585	741	78	<b>2121</b>
1999	182	45	271	251	13	568	810	92	<b>2232</b>
2000	175	47	279	241	13	526	729	77	<b>2087</b>
2001	176	42	279	246	12	513	743	81	<b>2092</b>
2002	187	41	275	250	16	507	774	76	<b>2125</b>

<sup>1</sup> Prior to 1999, Group Va was combined with Group Vb, which is no longer surveyed. Separate Group Va figures for these years are not available.

Table 3F shows that of the 3,576 nondoctoral full-time faculty in Groups I, II, III, Va, M, and B, 1,862 (52%) are females. In Table 3G we see that in these same groups there are 7,771 part-time faculty, of which 3,195 (41%) are females.

## Enrollment Profile and Undergraduate Degrees/Majors Profile

### Enrollment

The Departmental Profile Survey obtained information about enrollments and distribution of instructional effort among various course categories in mathematical sciences departments. Table 4A

**Table 4C: Undergraduate and Graduate Enrollments per Full-Time Faculty Member, Fall 2002**

	GROUP								
	I Public	I Private	II	III	Va	M	B	IV	
<b>Undergraduate Course Enrollments</b> Number per full-time faculty member	107	43	114	121	50	117	95	55	
<b>Graduate Course Enrollments</b> Number per full-time faculty member	6	5	4	5	9	3	-	20	

**Table 4D: Undergraduate Enrollments per Full-Time Faculty Member, Fall 1997 to Fall 2002**

	GROUP								
	I Public	I Private	II	III	Va	M	B	IV	
1997	110	52	115	113	- <sup>1</sup>	106	96	57	
1998	109	52	114	108	- <sup>1</sup>	117	94	60	
1999	115	54	111	122	43	127	114	68	
2000	107	52	117	119	39	110	95	56	
2001	101	47	114	120	41	118	94	57	
2002	107	43	114	121	50	117	95	55	

<sup>1</sup> Prior to 1999, Group Va was combined with Group Vb, which is no longer surveyed. Separate Group Va figures for these years are not available.

gives the total undergraduate and total graduate enrollments in mathematics courses for each group that is part of the Annual Survey. Each enrollment in this and other tables in this section is projected from schools responding to the survey, as discussed on page 926. In fall 2002, for the fourth year the projections for Groups M and B were made from those schools responding in the stratified random sample for each of these groups. This makes it possible to calculate standard errors for the estimated enrollments for these groups and for the estimated total enrollment for all groups. These standard errors, available for the second year, are also found in Table 4A. The estimated total enrollment for all groups is 2,125,000, with a standard error of 27,000, indicating



**Table 5A: Undergraduate Degrees Awarded and Junior/Senior Majors (hundreds), Fall 2002**

	GROUP								
	I Public	I Private	II	III	Va	M	B	I, II, III, Va, M, & B	IV
<b>Total Undergraduate</b>									
<b>Degrees awarded</b> (hundreds)	18	8	18	15	2	45	109	217	3
(Standard error)						(6)	(7)	(9)	
Computer science only	1	0	0	2	0	13	31	48	0
<b>Junior/senior majors</b> (hundreds)	57	19	51	52	6	162	302	648	10
(Standard error)						(14)	(17)	(22)	
Computer science only	5	1	1	8	0	38	95	148	0
<b>Female Undergraduate</b>									
<b>Degrees awarded</b> (hundreds)	7	2	8	7	1	20	46	91	1
Computer science only	0	0	0	0	0	4	9	14	0
<b>Junior/senior majors</b> (hundreds)	20	5	21	22	2	70	129	270	4
Computer science only	1	0	0	1	0	10	28	41	0

**Table 5B: Undergraduate Degrees Awarded and Junior/Senior Majors (hundreds) in Groups I, II, III, Va, M & B Combined, Fall 1993 to Fall 2002**

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
<b>Total Undergraduate</b>										
Degrees awarded (hundreds)	-	-	-	-	-	-	-	-	-	217
Junior/senior majors (hundreds)	696	669	678	631	596	590	568	599	589	648
<b>Female Undergraduate</b>										
Degrees awarded (hundreds)	-	-	-	-	-	-	-	-	-	91
Percentage female	-	-	-	-	-	-	-	-	-	42
Junior/senior majors (hundreds)	301	287	286	273	257	255	248	244	242	270
Percentage female	43	43	42	43	43	43	44	41	41	42

that the actual total enrollment is likely within 2,125,000 +/- 54,000. Table 4B gives these totals for fall 1997 to fall 2002.

Beginning with this 2002 survey, the Departmental Profile form no longer requests a breakdown of the total undergraduate enrollments into eight subcategories of courses. For a comprehensive survey of specific undergraduate courses, please refer to the report of the 2000 CBMS survey, *Statistical Abstract of Undergraduate Programs in the Mathematical Sciences in the U.S.: Fall 2000 CBMS Survey* (American Mathematical Society, Providence, RI, 2002). This publication is available on the AMS website at [www.ams.org/cbms/](http://www.ams.org/cbms/).

Table 4C gives the undergraduate enrollments per faculty member and the graduate enrollments per faculty member for each group. Table 4D gives the undergraduate enrollments per faculty member in each group for fall 1997 to fall 2002.

Looking at the historical data among the enrollment tables just presented for fall 1997 to fall 2002, one sees no major trends. This has been a relatively stable period for enrollments.

### Undergraduate Degrees and Majors

Table 5A gives the number of undergraduate degrees awarded and the number of junior/senior majors, and the number of each that are female

and that are in computer science for each group. Table 5B presents the trends in these data for fall 1993 to fall 2002. This year for the first time our table includes "undergraduate degrees awarded", as this statistic may be more accurate than "junior/senior majors"; future comparisons will be to undergraduate degrees awarded. The number of junior/senior mathematics majors in Groups I, II, III, Va, M, and B dropped from 69,600 in 1993 to 56,800 in 1999 but has been higher in the past three years; it is estimated at 64,800 in 2002 (the highest since 1995), up 5,900 over the estimated 58,900 in 2001. The percentage of the junior/senior majors who are females remained relatively stable for the years 1993 to 2002, from a low of 41% to a high of 44%.

The reader should be aware that at least 50 of the 192 departments in the 2002 Group M population and at least 270 of the 1,029 departments in the 2002 Group B population also offer a computer science program in addition to their offerings in mathematics. In some instances, these computer programs account for a major fraction of the department's undergraduate degrees and majors. This year's estimated 64,800 majors includes an estimated 14,800 majors in computer science programs that are located in mathematics departments,

and this year's estimated 21,700 undergraduate degrees awarded includes 4,800 in computer science.

The report of the 2000 CBMS survey provides a more comprehensive study of departmental bachelor's degrees.

## Graduate Student Profile

Table 6A summarizes information gathered about graduate students by the 2002 Departmental Profile survey. This table gives the number of full-time, full-time first year, and part-time graduate students for each type of graduate department. These same numbers are also given for female graduate students and for U.S. citizen graduate students.

The total number of full-time graduate students in Groups I, II, III, Va, and M combined increased from 2001 to 2002, with 12,127 and 12,647 respectively. In general, in Table 6A there were gains in every group except Groups I Private and M. First-year full-time graduate students in Groups I, II, III,

Va, and M combined decreased by 103 to 4,008, a decrease of 3%; this decrease occurred entirely in Groups Va and M. Female full-time graduate students in Groups I, II, III, Va, and M combined increased from 4,088 to 4,328, a 6% increase. U.S. citizen full-time graduate students in these same groups increased by 10% to 6,724. There is a great deal of variability in the number of full-time graduate students in Group M, even in universities that are roughly the same size. Evidence of this is the standard error of 336. We can also expect substantial variation in the total number of all full-time graduate students from year to year due to the large variation in Group M.

Part-time graduate students in Groups I, II, III, and Va held steady at 1,490 this year. The figure for last year, 1,475, had been a considerable drop from the 1,600 reported in 2000. Group III has 779 (52%) of the part-time graduate students in these groups. In these doctoral groups, 37% of the part-time graduate students are females and 75% are U.S. citizens. Group M part-time graduate students decreased from 3,682 to 3,064, down 17%. Last year's

**Table 6A: Graduate Students, Fall 2002**

	GROUP								
	I Public	I Private	II	III	Va	I, II, III, & Va	M	I, II, III, Va, & M	IV
<b>Total Graduate Students</b>									
Number who are full-time <i>(Standard error)</i>	2627	1471	2777	2251	846	9972	2675 <i>(336)</i>	12647 <i>(336)</i>	3996
Number who are first-year	723	414	888	772	199	2996	1012	4008	1402
Number who are part-time <i>(Standard error)</i>	164	185	299	779	63	1490	3064 <i>(806)</i>	4554 <i>(806)</i>	916
<b>Female Graduate Students</b>									
Number who are full-time	673	326	991	860	286	3136	1192	4328	2151
Number who are first-year	199	118	338	312	71	1038	416	1454	782
Number who are part-time	74	40	121	302	15	552	1349	1901	522
<b>U.S. Citizen Graduate Students</b>									
Number who are full-time <i>(Standard error)</i>	1391	617	1516	1079	452	5055	1669 <i>(193)</i>	6724 <i>(193)</i>	1707
Number who are first-year	433	165	531	384	117	1630	642	2272	624
Number who are part-time <i>(Standard error)</i>	115	119	243	598	49	1124	2515 <i>(723)</i>	3639 <i>(723)</i>	721

**Table 6B: Full-Time Graduate Students in Groups I, II, III, & Va by Sex and Citizenship, Fall 1993 to Fall 2002**

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
<b>Total full-time graduate students</b>	10525	10185	9761	9476	9003	8791	8838	9637	9361	9972
First-year full-time	2762	2668	2601	2443	2386	2458	2664	2839	2875	2996
First-year full-time U.S. citizen	1700	1664	1551	1465	1316	1349	1401	1527	1517	1630
Female full-time graduate students	2990	2927	2877	2760	2691	2770	2766	3016	2899	3136
Male full-time graduate students	7535	7258	6884	6716	6312	6021	6072	6621	6462	6836
U.S. citizen full-time graduate students	5865	5945	5623	5445	4947	4831	4668	5085	4631	5055
Non-U.S. citizen full-time graduate students	4660	4240	4138	4031	4056	3960	4170	4552	4730	4917

figure of 3,682 had been an increase of 76% from the 2000 figure of 2,091 part-time graduate students in Group M. The standard error for part-time graduate students in Group M departments is 806, indicating huge differences in the number of part-time graduate students from department to department. This also means we can expect to see large differences from year to year in the total number of part-time graduate students in all groups. For Group M, 44% of the part-time graduate students are females, and 82% are U.S. citizens.

Table 6B gives the total number of full-time, of full-time first-year, of full-time female, of full-time male, of full-time U.S. citizen, and of full-time non-U.S. citizen graduate students in Groups I, II, III, and Va combined for fall 1993 through 2002. All of these had increases this year compared to 2001. All of these had substantial increases from 1999 to 2000, with a leveling off from 2000 to 2001. This year showed increases again in every category.

### Previous Annual Survey Reports

The 2002 Annual Survey First and Second Reports were published in the *Notices of the AMS* in the February and August 2003 issues respectively. For the last version of this report, the 2001 Annual Survey Third Report was published in the *Notices of the AMS* in the September 2002 issue. 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](http://www.ams.org/employment/surveyreports.html).

### 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 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*.<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 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/surveyreports.html](http://www.ams.org/employment/surveyreports.html).*

<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. Coggshall, 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.