

2003 Annual Survey of the Mathematical Sciences

(Third Report) with corrections

Faculty Profile
Enrollment and Undergraduate Degrees Profile
Graduate Student Profile

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

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 911 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 2003–2004 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 in 2002, 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.

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

This Third Report of the 2003 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 2003 Annual Survey represents the forty-seventh in an annual series begun in 1957 by the American Mathematical Society. The 2003 Survey is under the direction of the Data Committee, a joint committee of the American Mathematical Society, the American Statistical Association, the Institute of Mathematical Statistics, and the Mathematical Association of America. The current members of this committee are Amy Cohen-Corwin, Donald M. Davis, Nicholas M. Ercolani, J. Douglas Faires, Alexander J. Hahn, Naresh Jain, Stephen F. Kennedy, Ellen E. Kirkman (chair), David J. Lutzer, Polly Phipps, and James W. Maxwell (ex officio). The committee is assisted by AMS survey analyst Colleen Rose. Comments or suggestions regarding this Survey Report may be directed to the committee.

it is a public or a private school. For the third year, standard errors are reported for several of the more important projections made in Groups M and B. The box on page 902 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 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).

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

Highlights

The estimated total number of full-time doctoral positions under recruitment in mathematics departments (Groups I, II, III, Va, M, and B combined) is down to 1,504 from 1,867 last year (a drop of 19%). Of these 1,504 full-time positions, 1,007 were tenured/tenure-track, down from 1,320 last year (a drop of 24%). Of the 1,007 full-time tenured/tenure-track doctoral positions, 869 were open to new doctorates, down from 1,124 last year (a drop of 23%).

The estimated total number of full-time doctoral positions filled with a doctoral hire in mathematics departments is down to 1,116 from 1,319 last year (a decrease of 15%); this total number is down 28% (427 from 593) in Groups I, II, III, and Va combined, and down 5% (688 from 725) in Groups M and B combined. The total number of tenured/tenure-track doctoral hires is down 14% in Groups I, II, III, and Va combined (to 220 from 254 last year), and 4% in Groups M and B combined (to 503 from 528 last year).

The estimated total number of new doctoral hires in mathematics departments is down 38% (384 from 623) this year from last year; it is down 44% (to 174 from 309) in Groups I, II, III, Va combined, and down 33% (to 210 from 314) in Groups M and B combined. The number of new doctoral tenured/tenure-track hires is down 43% (193 from 337); it is down 58% (to 33 from 79) in Groups I, II, III, Va combined, and down 38% (to 160 from 258) in Groups M and B combined.

The estimated number of not-new doctoral hires in mathematics departments is up 5% to 731 from 695 last year (this number is up in Groups M and B combined, and down in Groups I, II, III, Va combined). The estimated number of not-new doctoral hires into tenured/tenure-track positions is up both in Groups I, II, III, and Va combined (187 from 175 last year) and in Groups M and B combined (344 from 270 last year, a 27% increase over last year).

The total number of full-time faculty in Groups I, II, III, Va, M, and B combined is estimated at 20,421, with a standard error of 347; this total is up 414 from last year. The number of full-time faculty having doctorates in this total is estimated at 16,819, up from 16,430 last year. The number of full-time doctoral non-tenure-track faculty in this total is estimated at 2,032, down from 2,057 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 5,195, up from 5,019 last year. The number of non-doctoral full-time faculty is estimated at 3,602, up from 3,577 last year. The estimated number of part-time doctoral faculty in this total is 7,338, down from 7,771 last year. Detailed information is given in this report about these groups.

The estimated number of full-time graduate students in mathematics departments decreased to 11,997 from 12,647 last year. The estimated number of full-time graduate students in Groups I, II, III, and Va combined who are first year is up 21% over last year, and is at the highest level in ten years; this number has been increasing each year beginning in 1997 and is up 51% since 1997. The number of full-time graduate students who are first year and U.S. citizens is down 13% over last year.

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 911. 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 4,101, with a standard error of 134. This means the actual number of full-time faculty in Group M is most likely between 4,101 plus or minus two standard errors, or between 3,833 and 4,369. This is much more informative than simply giving the estimate of 4,101.

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 20,421, with a standard error of 347.

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

Table 1: Faculty Attrition,¹ Fall 2003

	GROUP									
	I Public	I Private	II	III	Va	I, II, III, & Va	M	B	I, II, III, Va, M, & B	IV
Full-time faculty who retired or died										
Total number (Standard error)	33	8	72	61	11	184	119 (8)	222 (33)	525 (34)	26
Percentage	1.9	1.0	2.9	2.9	3.3	2.4	2.9	2.5	2.6	1.8

¹ Number and percentage of full-time faculty who were in the department in fall 2002 but were reported to have retired or died by fall 2003.

Faculty Profile

The Departmental Profile, sent in fall 2003 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 2003 First Report presented data collected earlier about faculty salaries (pages 218–33 of the February 2004 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 2003 mathematics faculty attrition rate for Groups I, II, III, Va, M, and B combined is 2.6%. Figure 1 shows the trend in the attrition rate for these departments during the years 1988 to 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 2003, Group I Private had

Figure 1: Percent of Full-Time Doctoral Faculty Who Retired or Died in Groups I, II, III, Va, M, & B, Fall 1988 to Fall 2003

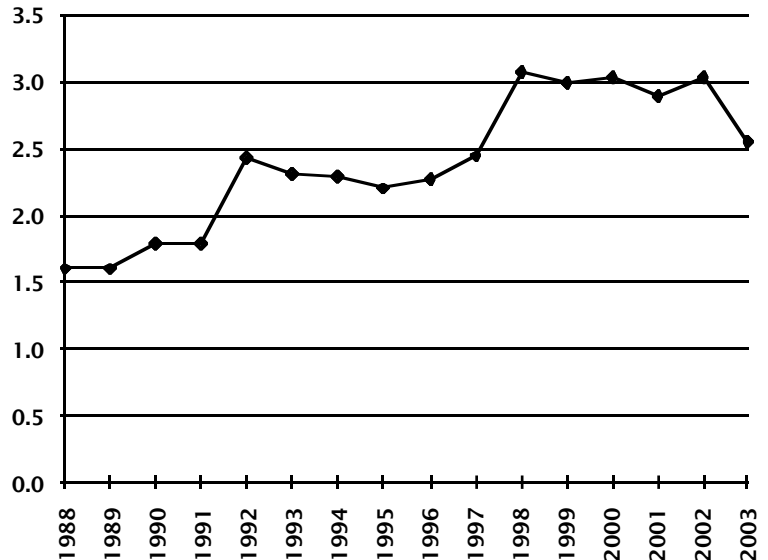


Table 2A: Recruitment of Doctoral Faculty, Fall 2003

	GROUP									
	I Public	I Private	II	III	Va	I, II, III, & Va	M	B	I, II, III, Va, M, & B	IV
Posted Doctoral Positions										
Total number¹ (Standard error)	135	114	128	133	22	532	308 (27)	664 (67)	1504 (72)	134
Tenured/tenure-track	64	43	72	104	13	296	242	470	1007	90
Open to new doctoral recipients	101	74	103	105	15	398	273	631	1302	91
Tenured/tenure-track	38	7	52	78	8	183	242	444	869	59
Open at assoc/full level	17	24	22	34	11	108	59	103	269	38
Reported Hires for Above										
Total number	117	105	117	101	14	454	241	563	1258	93
Male doctoral hires	94	84	73	78	13	342	122	375	839	62
Tenured/tenure-track	41	29	45	57	5	177	100	247	524	44
Female doctoral hires	22	18	27	17	1	85	66	125	277	29
Tenured/tenure-track	12	3	15	12	1	43	62	94	200	19
Male temporary hires	1	3	13	5	0	22	23	23	67	2
Female temporary hires	0	0	4	1	0	5	30	39	75	0
Total new doctoral hires	59	49	40	24	2	174	67	143	384	43
Male new doctoral hires	49	39	30	20	1	139	38	93	270	25
Tenured/tenure-track	4	5	5	13	0	27	32	68	127	19
Female new doctoral hires	10	10	10	4	1	35	29	50	114	18
Tenured/tenure-track	1	0	0	4	1	6	29	31	66	10
Unfilled positions	18	9	11	32	8	78	67	101	246	41

¹ Number of full-time doctoral positions under recruitment in 2002–2003 to be filled for 2003–2004.

the lowest attrition rate at 1%, while Group Va the highest at 3.3%.

Faculty Recruitment

Table 2A contains detailed information on the number of full-time doctoral faculty positions in mathematical sciences departments under recruitment in 2002-2003 for employment beginning in the academic year 2003-2004. Among mathematics departments (Groups I, II, III, Va, M, and B), 1,504 positions were under recruitment in 2002-2003 for employment beginning in the academic year 2003-2004, down 19% compared to last year. Of those 1,504 positions, 1,302 (87%) were available to new doctoral recipients, and of those 1,302 positions, 869 (67%) were tenured/tenure-track positions. The 869 tenured/tenure-track positions open to new doctoral recipients is down 23% from the

1,124 such positions under recruitment in 2001-2002; in Groups M and B combined the total number of tenured/tenure-track positions open to new doctoral recipients dropped from 851 last year to 686 this year (a 19% drop), and in Groups I, II, III, Va combined this number dropped from 272 to 183 (a 33% 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 1,007, down from last year's 1,320 (a drop of 24%). In Groups I, II, III, and Va combined, the total number of posted doctoral positions open at the associate/full level dropped from 159 last year to 108 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 mathematics departments (Groups I, II, III, Va, M, and B combined) is down to 1,116 from 1,319 last year (a decrease of 15%) mainly because the number of full-time doctoral hires in Groups I, II, III, Va combined is down 28%. This year Groups I, II, III, and Va combined filled 427 doctoral positions, of which 220 (52%) were tenured/tenure-track positions. Last year these same groups filled 593 doctoral positions, of which 254 (43%) were tenured/tenure-track. Groups M and B combined filled 689 doctoral positions this year, and 504 (73%) of these were tenured/tenure-track positions. Last year these two groups filled 725 doctoral positions, of which 528 (73%) were tenured/tenure-track.

Beginning with the 2003 Annual Survey, departments were asked to report the number of tenured/tenure-track positions filled by individuals who held a postdoctoral appointment the previous year. For Groups I, II, III, and Va combined, 93 (42%) of the 220 tenured/tenure-track positions filled were filled by such individuals. For Groups M and B combined, 188 (37%) of the 504 tenured/tenure-track positions filled were filled by such individuals.

This year there are fewer new doctoral hires in mathematics departments, but more not-new doctoral hires in Groups M and B combined. The estimated total number of new doctoral hires in mathematics departments is down 38% (384 from 623) this year from last year; it is down 44% (to 174 from 309) in Groups I, II, III, Va combined, and down 33% (to 210 from 314) in Groups M and B combined. The number new doctoral tenured/tenure-track hires is down 43% (193 from 337); it is down 58% (to 33 from 79) in Groups I, II, III, Va com-

Table 2B: A Summary of Recruitment of Doctoral Faculty, Fall 2003

	GROUP		
	I, II, III, & Va	M & B	IV
Posted Doctoral Positions			
Total number	532	972	134
Tenured/tenure-track	296	712	90
Open to new doctoral recipients	398	905	91
Tenured/tenure-track	183	686	59
Reported Hires for Above			
Total new doctoral hires ¹	174	210	43
Tenured/tenure-track	33	160	30
Male	139	131	25
Tenured/tenure-track	27	100	19
Female	35	79	18
Tenured/tenure-track	6	60	10
Total other doctoral hires	253	479	48
Tenured/tenure-track	187	344	34
Male	203	367	38
Tenured/tenure-track	150	247	25
Female	50	113	10
Tenured/tenure-track	37	97	9

¹ New doctoral hires are individuals who've held a doctorate for less than one year at the time of hiring.

Table 2C: Percentage Tenured/Tenure-Track for Positions Posted and Filled, Fall 2003

	GROUP		
	I, II, III, & Va	M & B	IV
Positions opened to			
New doctoral recipients	398	905	91
% tenured/tenure-track	46	76	65
Positions filled by			
New doctoral Recipients	174	210	43
% tenured/tenure-track	19	76	69
Positions filled by			
Not-new doctoral recipients ¹	253	479	48
% tenured/tenure-track	74	72	70

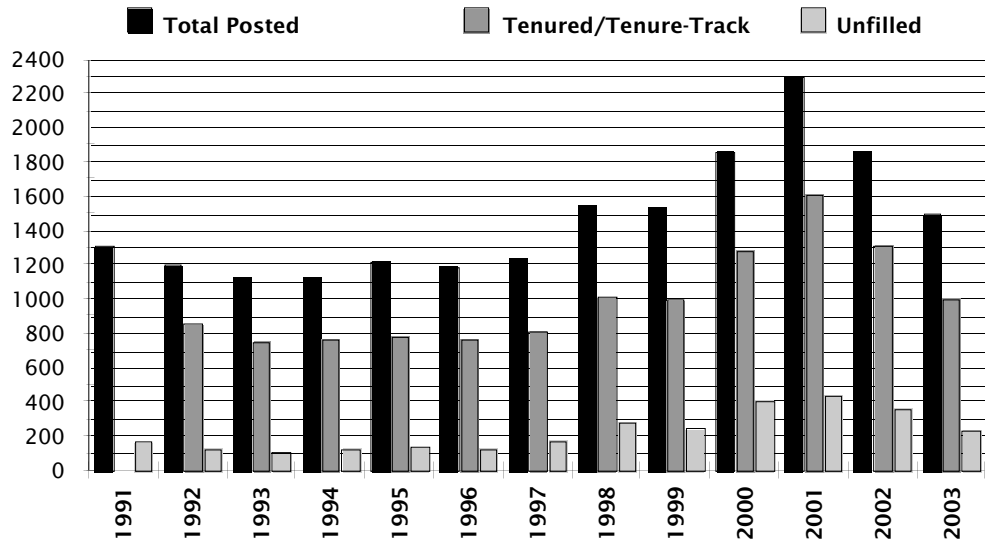
¹ Not-new doctoral recipients are individuals who've held their doctorate for more than one year at the time of hiring.

bined, and down 38% (to 160 from 258) in Groups M and B combined.

The estimated number of not-new doctoral hires in mathematics departments is up 5% to 732 from 695 last year (this number is up in Groups M and B combined, and down in Groups I, II, III, Va combined). The estimated total of not-new doctoral hires into tenured/tenure-track positions is up in Groups I, II, III, and Va combined (187 from 175 last year) and up in Groups M and B combined (344 from 270 last year) a 27% increase 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 41% of

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 1991 to Fall 2003



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

Table 3A: Total Faculty, Fall 2003

	GROUP									
	I Public	I Private	II	III	Va	I, II, III, & Va	M	B	I, II, III, Va, M, & B	IV
Total full-time faculty <i>(Standard error)</i>	1758	969	2452	2076	323	7578	4101 <i>(134)</i>	8742 <i>(320)</i>	20421 <i>(347)</i>	1482
Doctoral full-time faculty	1700	964	2159	1771	308	6902	3285	6632	16819	1430
Tenured	1143	556	1545	1264	172	4680	2283	4117	11080	796
Untenured, tenure-track	158	76	277	337	32	880	772	2055	3707	307
Postdoctoral appointments	253	170	168	52	69	712	21	74	807	91
Other non-tenure-track <i>(Standard error)</i>	146	162	169	118	36	631	208 <i>(29)</i>	386 <i>(51)</i>	1225 <i>(58)</i>	236
Nondoctoral full-time faculty	58	5	293	305	15	676	816	2110	3602	52
Total part-time faculty <i>(Standard error)</i>	194	52	390	715	38	1389	1952 <i>(211)</i>	3997 <i>(259)</i>	7338 <i>(335)</i>	263

Table 3B: Female Faculty, Fall 2003

	GROUP									
	I Public	I Private	II	III	Va	I, II, III, & Va	M	B	I, II, III, Va, M, & B	IV
Female full-time faculty <i>(Standard error)</i>	240	105	463	456	49	1313	1217 <i>(74)</i>	2666 <i>(135)</i>	5195 <i>(153)</i>	401
Doctoral full-time faculty	204	103	287	284	41	919	752	1698	3370	372
Tenured	77	28	119	145	18	387	440	921	1748	130
Untenured, tenure-track	28	6	61	95	4	194	237	685	1116	118
Postdoctoral appointments	52	36	37	4	14	143	3	0	146	32
Other non-tenure-track	47	33	70	40	5	195	73	92	360	92
Nondoctoral full-time faculty	36	2	176	172	7	393	464	967	1825	30
Female part-time faculty	70	5	137	262	10	484	720	1672	2875	99

Table 3C: Number and Percentage of Full-Time Faculty, Fall 2003

	GROUP								TOTAL
	I Public	I Private	II	III	Va	M	B	IV	
Full-Time Faculty									
Number	1758	969	2452	2076	323	4101	8742	1482	21903
Percentage of total full-time faculty	8	4	11	9	1	19	40	7	100
Female Full-Time Faculty									
Number	240	105	463	456	49	1217	2666	401	5596
Percentage of female full-time faculty	4	2	8	8	1	22	48	7	100
Female Full-Time Faculty									
Percentage female full-time faculty by group	14	11	19	22	15	30	30	27	26

Table 3D: Number, and Percentage of Those Female, of Non-tenure-track Doctoral Full-Time Faculty and Part-Time Faculty by Group, Fall 1997 to Fall 2003

	1997	1998	1999	2000	2001	2002	2003
Groups I, II, III, & Va							
Non-tenure-track doctoral full-time faculty	708	904	1014	993	1233	1274	1343
Percentage female	22	21	22	21	21	23	25
Part-time faculty	954	1141	1217	1399	1467	1504	1389
Percentage female	37	38	38	37	38	35	35
Group M							
Non-tenure-track doctoral full-time faculty	216	140	146	262	183	276	230
Percentage female	30	27	56	29	24	39	33
Part-time faculty	1612	1768	1768	1906	2323	2393	1952
Percentage female	46	43	43	35	36	37	37
Group B							
Non-tenure-track doctoral full-time faculty	385	427	514	407	504	507	460
Percentage female	26	31	24	30	29	36	20
Part-time faculty	3107	3585	3298	3580	4197	4117	3997
Percentage female	46	42	41	40	43	45	42

the positions hired went to new doctoral recipients (last year 52%), while in Groups M and B 31% of the positions hired went to new doctoral recipients (last year 43%). In Groups I, II, III, and Va 19% of the hires of new doctoral recipients are in tenured/tenure-track positions (last year it was 26%), while in Groups M and B 76% of the new doctoral hires are in tenured/tenure-track positions (last year it was 82%).

From Table 2B we find that of the new doctoral recipients hired in Groups I, II, III, and Va combined, 19% of the males and 17% of the females took tenured/tenure-track positions. For new doctoral recipients hired in Groups M and B combined, 76% of the males and 76% of the females took tenured/tenure-track positions.

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 1991 to 2003. 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 steadily increased, reaching a maximum in 2001, and has declined the past two years.

The recruitment situation in statistics (Group IV) is much like last year, but with fewer tenure-track positions available and fewer tenure-track hires. This year there were 134 (90 tenure-track) positions under recruitment, while last year there were 169 (141 tenure-track). This year 91 positions were open to new doctorates and last year this number was 121. However, the number of tenure-track positions open to new doctorates declined from 108 last year to 59 this year. The number of hires of new doctoral recipients is 43 (30 tenure-track) this year and 58 (48 tenure-track) last year. The number of not-new doctoral hires is 48 (34 tenure-track) this year and 52 (39 tenure-track) last year. Females were 34% of the new doctoral tenure-track hires, and 26% of the not-new doctoral tenure-track hires.

Table 3E: Summary of Full-Time and Part-Time Faculty by Sex, Fall 2003

	GROUP					
	I, II, III, & Va		M & B		IV	
	Male	Female	Male	Female	Male	Female
Full-time faculty	6265	1313	8961	3882	1080	401
Percentage	83	17	70	30	73	27
Doctoral full-time faculty	5971	919	7467	2450	1058	372
Percentage	87	13	75	25	74	26
Tenured	4293	387	5039	1361	666	130
Percentage	92	8	79	21	84	16
Untenured, tenure-track	686	194	1905	922	189	118
Percentage	78	22	67	33	62	38
Postdoctoral appointments	569	143	92	3	59	32
Percentage	80	20	96	4	65	35
Other non-tenure-track	436	195	430	165	143	92
Percentage	69	31	72	28	61	39
Nondoctoral full-time faculty	282	393	1494	1432	23	30
Percentage	42	58	51	49	43	57
Part-time faculty	906	484	3557	2392	164	99
Percentage	65	35	60	40	62	38

Faculty

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 20,421, up 414 from last year, with a standard error of 347. We can be quite confident that the actual total number of faculty in these groups is in the interval 20,421 plus or minus 694. The doctoral mathematics departments I, II, III, and Va are up 67 full-time faculty members, Group M is down 241 faculty members, and Group B is up 588. Since the standard errors for the total number of full-time faculty in Groups M and B are 134 and 320 respectively, there may not be an actual change, as these increases are well within the variability we expect with standard errors of 134 and 320. The total faculty size in Group IV is up to 1,482 this year from 1,397 last year.

This year for the first time the Departmental Profile Survey requested the number of postdoctoral appointments to be broken out of the number of non-tenure track appointments. In the future we will be able to track the changes in the number of postdoctoral appointments.

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 in mathematics departments had been increasing in recent years, 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). However, this year the estimated number of part-time faculty is down to 7,338 from 7,771 last year, and the number of non-tenure-track doctoral faculty (including postdoctoral positions) is estimated at 2,032 this year, down from 2,057 last year. But in Groups I, II, III, and Va combined the number of non-tenure-track doctoral faculty increased 5% from 1,274 last year to 1,343 this year. Table 3D gives a seven-year history of these two types of faculty for Groups I, II, III, and Va combined; for Group

Table 3F: Doctoral and Nondoctoral Full-Time Faculty, Fall 2003

	GROUP					
	I, II, III, & Va		M & B		TOTAL	
	Male	Female	Male	Female	Male	Female
Doctoral full-time faculty	5971	919	7467	2450	13438	3370
Tenured	4293	387	5039	1361	9332	1748
Untenured, tenure-track	686	194	1905	922	2591	1116
Postdoctoral appointments	569	143	92	3	661	146
Other non-tenure-track	436	195	430	165	866	360
Nondoctoral full-time faculty	282	393	1494	1432	1776	1825
Tenured	13	7	573	337	586	344
Untenured, tenure-track	14	4	191	153	205	157
Postdoctoral appointments	8	3	0	0	8	3
Other non-tenure-track	255	382	730	942	985	1324

M; and for Group B. Also shown for each number in this table is the percentage of females.

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

Table 3G: Part-Time Faculty, Fall 2003

	GROUP				
	I, II, III, & Va		M & B		TOTAL
	Male	Female	Male	Female	
Doctoral part-time faculty	405	125	839	264	1633
Nondoctoral part-time faculty	500	358	2718	2128	5705
TOTAL	906	484	3557	2392	7338

Table 4A: Undergraduate and Graduate Enrollments (thousands), Fall 2003

	GROUP									
	I Public	I Private	II	III	Va	I, II, III, & Va	M	B	IV	TOTAL
Undergraduate Course Enrollments Total number (thousands) <i>(Standard error)</i>	185	41	283	255	17	782	498 (25)	774 (26)	72	2125 (36)
Graduate Course Enrollment Total number (thousands)	10	5	11	11	2	40	16	-	31	87

Table 4B: Total Undergraduate Enrollments (thousands), Fall 1998 to Fall 2003

	GROUP								
	I Public	I Private	II	III	Va	M	B	IV	TOTAL
1998	182	43	258	214	20 ¹	585	741	78	2121
1999	182	45	271	251	13	568	810	92	2232
2000	175	47	279	241	13	526	729	77	2087
2001	176	42	279	246	12	513	743	81	2092
2002	187	41	275	250	16	507	774	76	2125
2003	185	41	283	255	17	498	774	72	2125

¹ 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.

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 3,602 full-time faculty who do not have doctoral degrees. The majority of these faculty, 2,926 (81%), 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 Groups I, II, III, Va, M & B combined for 2003-2004 is 20,421, of which

Table 4C: Undergraduate and Graduate Enrollments per Full-Time Faculty Member, Fall 2003

	GROUP							
	I Public	I Private	II	III	Va	M	B	IV
Undergraduate Course Enrollments Number per full-time faculty member	104	42	113	121	46	121	89	46
Graduate Course Enrollments Number per full-time faculty member	6	5	4	5	6	4	-	20

Table 4D: Undergraduate Enrollments per Full-Time Faculty Member, Fall 1998 to Fall 2003

	GROUP								
	I Public	I Private	II	III	Va	M	B	IV	
1998	109	52	114	108	- ¹	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	
2003	104	42	113	121	46	121	89	46	

¹ 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.

5,195 (25%) are females, up from 5,019 (25%) last year. In the B group doctoral female faculty increased to 1,698 from 1,473 last year, tenured female faculty increased from 791 last year to 921 this year, and non-tenure-track doctoral female faculty dropped from 182 last year to 92 this year. In the M group doctoral full-time female faculty dropped from 811 last year to 752 this year, and the number of females in each category of Table 3B in Group M is down this year over last year.

Table 3C shows the number and percentage of all full-time and female full-time faculty that fall in each group for 2003-2004. 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

Table 5A: Undergraduate Degrees Awarded (hundreds), Fall 2003

	GROUP								I, II, III, Va, M, & B	IV
	I Public	I Private	II	III	Va	M	B			
Total Undergraduate Degrees awarded (hundreds) <i>(Standard error)</i>	22	9	17	17	3	41	111	220	4	
Computer science only	1	0	0	3	0	(4) 10	(6) 27	(7) 42	0	
Female Undergraduate Degrees awarded (hundreds)	8	2	7	7	1	19	47	90	2	
Computer science only	0	0	0	1	0	4	6	11	0	

Table 5B: Undergraduate Degrees Awarded (hundreds) in Groups I, II, III, Va, M & B Combined, Fall 2002 to Fall 2003

	2002	2003
Total Undergraduate Degrees awarded (hundreds)	217	220
Female Undergraduate Degrees awarded (hundreds)	91	90
Percentage female	42	41

of full-time faculty varies considerably among the groups, from 11% for Group I Private to 30% for Groups M and B. This is similar to the pattern 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 5 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 faculty for the years 1997 to 2003 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, Groups M and B combined, and Group IV for various categories of faculty. It shows that the percentage of women is generally higher in statistics (Group IV) than in the doctoral mathematics groups (Group I, II, III, Va combined), and that the percentage of tenured faculty who are women is highest in Group M and B combined.

Table 3F shows that of the 3,602 nondoctoral full-time faculty in Groups I, II, III, Va, M, and B, 1,825 (51%) are females. In Table 3G we see that in these same groups there are 7,338 part-time faculty, of which 2,876 (39%) are females.

Enrollment Profile and Undergraduate Degrees Profile

Enrollment

The Departmental Profile Survey obtained information about enrollments and numbers of undergraduate degrees awarded in mathematical sciences departments. Table 4A 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 902. In fall 2003, for the fifth 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 third year, are also found in Table 4A. The estimated total enrollment for all groups is 2,125,000, with a standard error of 36,000, indicating that the actual total enrollment is likely within 2,125,000 plus or minus 72,000. Table 4B gives these totals for fall 1998 to fall 2003.

Beginning with the 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/.

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 1998 to fall 2003.

Looking at the historical data among the enrollment tables just presented for fall 1998 to fall 2003, one sees no major trends. This has been a relatively stable period for enrollments.

Undergraduate Degrees

Table 5A gives the number of undergraduate degrees awarded, the number of each that are female, and the number that are in computer science for each group. Last year for the first time we began tabulating the number of “undergraduate degrees”, rather than the number of “junior/senior majors”; hence comparisons to previous years’ numbers of undergraduate degrees can be made only to last year, and this is done in Table 5B.

The reader should be aware that at least 50 of the 192 departments in the 2003 Group M population and at least 270 of the 1,029 departments in the 2003 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. This year’s estimated 22,000 undergraduate degrees awarded includes 4,200 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 2003 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 2002 to 2003, with 12,647 and 12,709 respectively, this year’s total is the highest during the period 1995-2003. The numbers of total full-time graduate students listed in Table 6A this year showed gains in Groups I Public, II, Va, and IV. The

Table 6A: Graduate Students, Fall 2003

	GROUP								
	I Public	I Private	II	III	Va	I, II, III, & Va	M	I, II, III, Va, & M	IV
Total Graduate Students									
Full-time (Standard error)	2992	1347	3009	2243	853	10444	2265 (172)	12709 (172)	4262
First-year full-time	534	439	808	713	217	2711	1018	3729	1373
Part-time (Standard error)	162	174	342	885	44	1607	2387 (308)	3994 (308)	725
Female Graduate Students									
Full-time	790	311	987	844	283	3215	928	4143	2203
First-year full-time	162	120	283	262	75	902	434	1336	686
Part-time	61	45	128	366	10	610	1167	1777	329
U.S. Citizen Graduate Students									
Full-time (Standard error)	1642	620	1718	1143	468	5590	1698 (136)	7288 (136)	1578
First-year full-time	270	263	474	401	119	1527	816	2344	550
Part-time (Standard error)	126	123	269	710	43	1271	2247 (298)	3518 (298)	528

Table 6B: Full-Time Graduate Students in Groups I, II, III, & Va by Sex and Citizenship, Fall 1994 to Fall 2003

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total full-time graduate students	10185	9761	9476	9003	8791	8838	9637	9361	9972	10444
First-year full-time	2668	2601	2443	2386	2458	2664	2839	2875	2996	2711
First-year full-time, U.S. citizen	1664	1551	1465	1316	1349	1401	1527	1517	1630	1527
Female full-time graduate students	2927	2877	2760	2691	2770	2766	3016	2899	3136	3215
Male full-time graduate students	7258	6884	6716	6312	6021	6072	6621	6462	6836	7229
U.S. citizen full-time graduate students	5945	5623	5445	4947	4831	4668	5085	4631	5055	5590
Non-U.S. citizen full-time graduate students	4240	4138	4031	4056	3960	4170	4552	4730	4917	4854

number of first-year full-time graduate students is down over last year in all groups except Group I Private, Va and M. The number of first-year full-time students in Groups I, II, III, Va, and M combined decreased by 279 to 3,729, a decrease of 7%. The number of full-time graduate students in Group IV increased this year by 7% to 4,262, and the first year full-time graduate student enrollment in Group IV decreased by 29 to 1,373, a decrease of 2%. The number of female full-time graduate students in Groups I, II, III, Va, and M combined decreased from 4,328 to 4,143, an 4% decrease, and in Group IV increased from 2,151 to 2,203, a 2% increase. The number of U.S. citizen full-time graduate students in Groups I, II, III, Va, and M combined increased by 8% to 7,288, and in Group IV decreased by 8% to 1,578. 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, and this is reflected in the standard errors of 172 this year and 336 last year. 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.

The number of part-time graduate students in Groups I, II, III, and Va increased to 1,607, a 8% increase this year, and in Group IV decreased 21% to 725. Group III has 885 (55%) of the part-time graduate students in the doctoral mathematics groups. In the doctoral mathematics groups, 38% of the part-time graduate students are females and 79% are U.S. citizens, and in Group IV 45% of the part-time graduate students are females and 73% are U.S. citizens. The number of Group M part-time graduate students decreased from 3,064 to 2,387 but the standard error for part-time graduate students in Group M departments is 308 this year and was 806 last year, 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, 49% of the part-time graduate students are females, and 94% are U.S. citizens.

Table 6B gives the total number of full-time, full-time first-year, full-time female, full-time male, full-time U.S. citizen, and full-time non-U.S. citizen graduate students in Groups I, II, III, and Va combined for fall 1994 through 2003. From this data we can see that total full-time graduate enrollment in the doctoral mathematics groups was falling until 1998, and has been generally increasing beginning in 1999. The estimated number of full-time graduate students in mathematics departments increased to 12,709 from 12,647 last year. The estimated number of full-time graduate students in Groups I, II, III, and Va combined who are first year is down, and is at the lowest estimate reported since 1999; this number had been increasing each year beginning in

Definitions of the Groups

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

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

Brief descriptions of the groupings are as follows:

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

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

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

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

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

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

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

Group B contains U.S. departments granting a baccalaureate degree only.

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

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

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

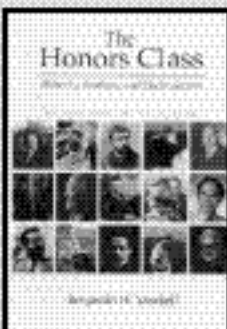
What your colleagues are saying about books you might have missed. . .



Paperback; 594 pp.; \$48.00

"... this magisterial work, splendidly produced, covers all aspects of the art and science [of origami]."
—Philip J. Davis,
SIAM Review

"... finally the secrets of an origami master are revealed!"
—Erik Demaine,
MIT



Paperback; 486 pp.; \$19.95

"... this is a remarkable book, the best mathematics book I've read for a long time, and one of the finest examples of expository writing in any field."
—John Stillwell, SIAM Review

"The Honors Class will be greatly enjoyed by anybody who wants to know more about mathematics and its practitioners."
—W. Timothy Gowers, NATURE



Paperback; 125 pp.; \$14.00

"Nobuyuki ("NOB") Yoshigahara is without question one of the world's greatest Puzzlemasters. . . In this little volume he has assembled 101 of his favorite puzzles, cleverly presented, with solutions far enough away that you won't be tempted to peek unless you've tried hard and given up."
—Solomon W. Golomb



A K Peters, Ltd.
888 Worcester St., Suite 230
Wellesley, MA 02482
Tel: 781.416.2888 Fax: 781.416.2839
www.akpeters.com • service@akpeters.com

2003 Annual Survey of Mathematical Sciences

1997. The estimated number of full-time graduate students who are first year and U.S. citizens had been generally increasing since 1998, but this year's number is down 6% over last year's number. The estimated number of full-time graduate students who are first year and not U.S. citizens had been increasing each year, from 975 in 1996 to 1366 in 2002; this year it dropped to 1184, a decrease of 13% over last year.

Previous Annual Survey Reports

The 2003 Annual Survey First and Second Reports were published in the *Notices of the AMS* in the February and August 2004 issues respectively. For the last version of this report, the 2002 Annual Survey Third Report was published in the *Notices of the AMS* in the September 2003 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.

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.