

Physics Enrolments in Australian and New Zealand Universities 1983 - 1993

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Introduction

In the early 1970's the Australian Academy of Sciences' National Committee for Physics recommended that statistical information on student enrolments, at both the secondary and tertiary level, should be collected and analysed on a regular basis.

Professor Charles Watson-Munro of the University of Sydney produced the first compilation of tertiary physics enrolment data for university students (Watson-Munro, 1974) covering the period 1963 to 1973, and De Laeter (1974) subsequently carried out a similar analysis for the Colleges of Advanced Education. It was then decided to combine this data in a single publication which should be revised at regular intervals, and this was carried out for the periods 1965 to 1975 (De Laeter and Watson-Munro, 1975) and 1974 to 1978 (De Laeter and Watson-Munro, 1979). Associate Professor Philip Jennings from Murdoch University became co-author of these enrolment surveys after the retirement of Professor Watson-Munro, and four reports have subsequently been published. These cover the periods 1977-1981 (De Laeter and Jennings, 1982), 1980 to 1984 (Jennings and De Laeter, 1984), 1980 to 1987 (De Laeter and Jennings, 1987) and 1980 to 1990 (Jennings and De Laeter, 1991). This publication is therefore the ninth in the series.

The demise of the binary system and the subsequent restructuring of the tertiary education system have caused a

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number of changes to the information recorded in the previous publications, and in the titles of some of the tertiary institutions. Data for the New Zealand Universities has been included for the first time in this survey, and we hope that this will be a feature of future enrolment surveys. This report also contains information on gender balance. There have been a number of initiatives designed to encourage females to enrol in tertiary physics courses, and it will be of interest to monitor changes which occur in the male/female balance in future years. It is of interest to note that the proportion of females opting to study upper secondary school physics has increased from 21.5% to 29.1% from 1976 to 1990 (De Laeter and Dekkers, 1992), and it might be expected that the tertiary physics statistics will reflect this trend in gender balance.

The data were obtained directly from the Heads of the various Physics Departments in Australia and New Zealand. We have tried to ensure that the tabulated data is accurate, but there may still be some minor inaccuracies due to the difficulty of uniquely identifying physics students at some institutions. However the approach we have adopted is consistent with that used in the previous surveys, so that the results and trends should be comparable over the past thirty years. It should be noted that the Australian Institute of Physics is in the process of reassessing all physics courses in Australia over the next few years. In past surveys the listed data refers to courses which have been accredited by the AIP.

Third Year Enrolments

Table 1 contains the data for third year physics enrolments for the period 1983-1993. Institutions are grouped by State, together with the group of New Zealand universities. A few of the numbers differ from those published in previous surveys as a result of retrospective corrections notified by Departmental Heads during the course of this survey. In Figure 1 we have plotted these enrolments over the twenty-

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TABLE 1 NUMBER OF THIRD YEAR PHYSICS STUDENTS 1983 - 1993

	1983	1984	1985	1986	1987	1988	1989	1990	1991		1992		1993	
									M	F	M	F	M	F
Griffith University	15	15	23	20	11	26	24	23	14	2	18	2	17	3
James Cook University	8	2	3	5	3	6	8	3	6	1	4	2	1	5
Queensland University of Technology	14	11	13	14	9	11	10	15	18	3	20	2	12	4
University of Central Queensland	14	12	14	16	14	13	21	31	21	2	10	2	16	3
University of Queensland	13	19	19	17	19	16	21	23	28		29		27	
University of Southern Queensland	4	8												
Total QUEENSLAND	68	67	72	72	56	72	84	95	95		89		88	
Macquarie University	6	13	10	16	9	10	8	10	7	0	22	6	16	5
University of Newcastle	7	5	3	5	2	2	1	4	7	0	4	1	4	1
University of New England	4	6	10	9	4	3	3	1	4	0	7	1	3	1
University of New South Wales	15	25	17	16	20	28	18	25	25	3	28	4	31	7
University of Sydney	48	38	45	55	57	65	46	45	41	5	39	12	40	10
University of Technology, Sydney	10	13	16	18	19	22	20	22	10	2	16	0	22	3
University of Western Sydney	-	-	-	-	-	-	-	-	2	0	5	4	13	5
University of Wollongong	3	1	5	4	3	5	8	6	5	1	4	0	5	3
Total NEW SOUTH WALES	93	101	106	123	114	135	104	113	112		153		169	
Australian Defence Force Academy *	44	41	35	15	5	5	8	2	6	0	6	0	8	1
Australian National University (TheFaculties)	15	13	18	7	19	12	17	12	7		9		20	
University of Canberra	13	17	11	6	8	1	0	0	0	0	1	0	1	0
Total AUSTRALIAN CAPITAL TERRITORY	36	33	31	28	32	18	25	14	13		16		30	
Ballarat University College	6	4	5	4	5	5	6	9	11	2	6	2	3	3
Chisholm Institute of Technology	22	24	24	24	25	22	15	15	-	-	-	-	-	-
Deakin University	4	2	3	2	2	2	5	0	6	2	11	3	8	6
La Trobe University	19	15	16	24	15	10	13	21	18	2	18	5	22	3
Monash University	27	26	21	33	29	30	41	40	60		57	6	60	8
Royal Melbourne Institute of Technology	21	13	20	20	22	48	27	28	30	3	28	3	28	4
Swinburne Institute of Technology	-	-	26	29	32	34	39	38	40	10	47	18	45	12
University of Melbourne	39	36	27	43	28	34	37	26	46	8	56	6	44	5
Victoria University	-	-	-	-	-	-	-	-	21	0	12	1	24	4
Total VICTORIA	174	158	175	179	158	185	183	177	259		279		279	
University of TASMANIA	9	18	14	9	6	14	11	12	18	1	11	1	16	5
Flinders University	10	5	5	11	15	21	14	17	10	4	10	4	13	0
University of Adelaide	39	39	31	34	46	43	40	46	31	5	18	2	27	7
University of South Australia	12	19	14	4	10	6	8	8	6	1	6	0	6	1
Total SOUTH AUSTRALIA	61	63	50	49	71	70	62	71	57		40		54	
Curtin University of Technology	10	13	23	15	13	13	12	19	14	2	20	2	22	2
Murdoch University	14	13	18	13	8	16	16	11	9	2	8	3	12	5
University of Western Australia	22	25	20	16	13	20	21	22	15	3	21	1	21	1
Total WESTERN AUSTRALIA	46	51	61	44	34	39	49	52	45		55		63	
NORTHERN TERRITORY University	-	-	-	-	-	-	1	1	0	0	0	0	0	0
Total AUSTRALIA	487	491	509	504	471	543	519	535	600		644		704	
Massey University	-	-	-	-	-	-	-	-	7	1	8	1	3	1
University of Auckland	-	-	-	-	-	-	-	-	37	4	41	4	58	6
University of Canterbury	-	-	-	-	-	-	-	-	36	4	28	4	20	2
University of Otago	-	-	-	-	-	-	-	-	12	2	9	2	7	4
University of Waikato	-	-	-	-	-	-	-	-	15	1	15	0	11	2
Victoria University of Wellington	-	-	-	-	-	-	-	-	8	1	11	1	16	2
Total NEW ZEALAND									128		124		132	

* The Australian Defence Force Academy commenced in 1986. The numbers for earlier years are the combined enrolments for the Single Service Colleges.

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five year period 1968 to 1993. It should be noted that the data in Figures 1 to 3 refer only to Australian Universities.

A number of changes have occurred since the previous survey (Jennings and De Laeter 1991). Data for the University of Western Sydney has been included, and Chisholm Institute of Technology is no longer listed as a separate entry as it is now amalgamated with Monash University. The Royal Melbourne Institute of Technology was previously referred to as the Victorian University of Technology (Jennings and De Laeter 1991), and data for Victoria University is listed for the first time. Victoria University was formed from Footscray Institute of Technology and several smaller institutions. The data for Footscray Institute of Technology was inadvertently omitted from that listed in the previous survey.

The total number of Australian third-year physics students has shown a marked increase in numbers over the past four years from 535 in 1990 to 704 in 1993 representing an increase of almost 32%. The average annual enrolment over the period 1991-1993 is 650 as compared to an average of 128 in New Zealand. The present population in Australia is approximately 17 million compared to a population of approximately 3.2 million in New Zealand. Thus there are, on average, 38 Australian third-year physics students per million population as compared to 40 per million in New Zealand. Despite the amalgamations which have occurred in Australian tertiary institutions, there are still a number of universities which have less than 10 students in the final year of their respective physics course.

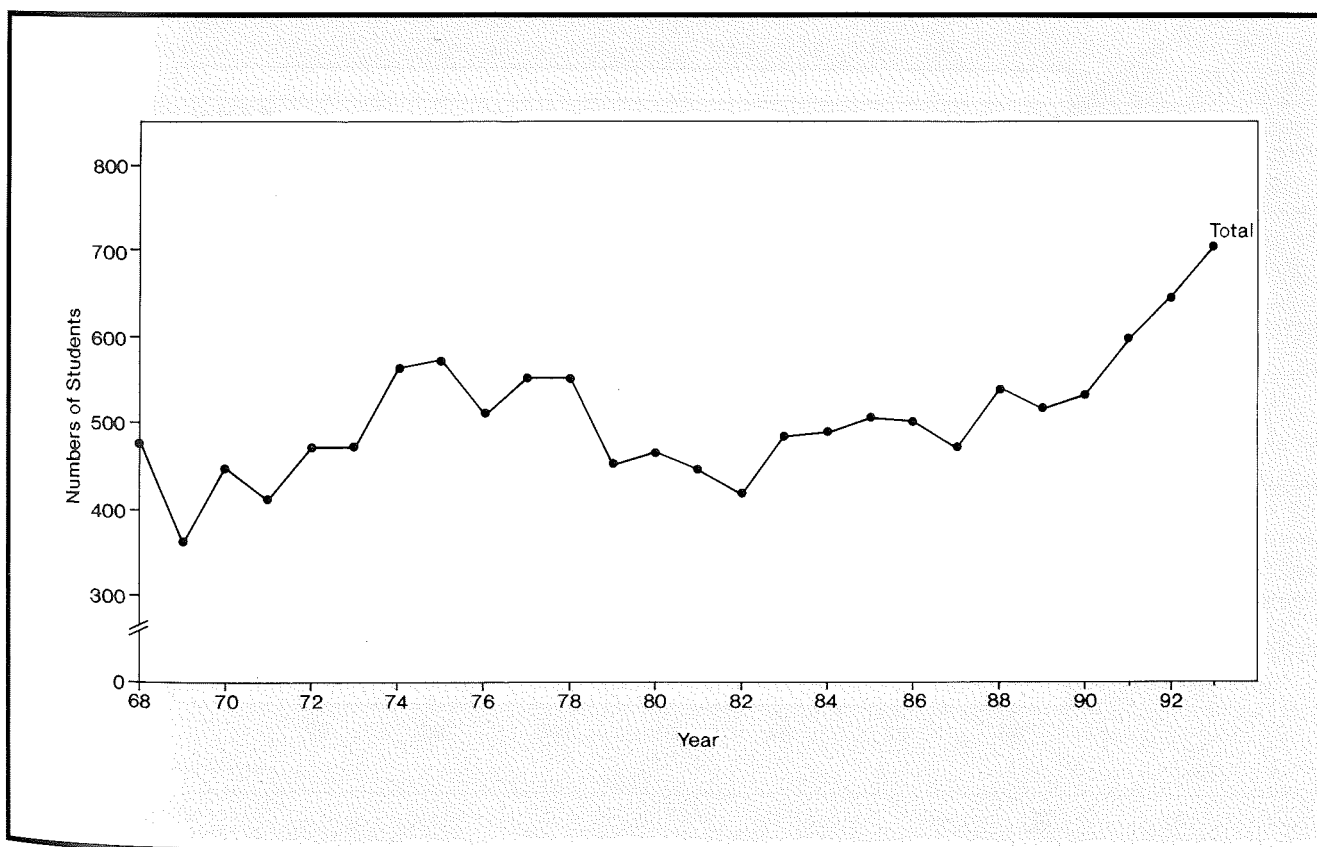
The male/female statistics listed in Table 1 reveal that approximately 15% of third-year physics enrolments in Australia are female as compared to 1% in New Zealand. There are insufficient data to determine trends in gender balance, but we intend to monitor this in future surveys.

However, it is worth noting that there has been an increase in the female proportion in third-year physics students in Australian universities from 12.7% in 1991 to 17.9% in 1993, although not all universities have been able to supply gender data.

Only three universities offer a distance education program in physics - Murdoch University, the University of Central Queensland and Massey University. It is pleasing to note that Physics Departments in a number of universities offer physics-related degree courses. These are as follows:-

- James Cook University Technology
- Queensland University of Technology Medical Radiation Technology
- University of Central Queensland Industrial Instrumentation
- Macquarie University Optoelectronics
- University of New South Wales Medical Physics
- University of Wollongong Astrophysics, Medical Physics
- Deakin University Microprocessor Applications
- Monash University Materials Science
- Royal Melbourne Institute of Technology Medical Radiation Science
- Swinburne University Medical Biophysics, Scientific Instrumentation and Biomedical Instrumentation
- Flinders University Geophysics, Meteorology and Oceanography
- Curtin University of Technology Geophysics
- Massey University : Electronics, Medical Physics
- University of Auckland Optoelectronics
- University of Waikato Electronics ▸

Figure 1 *Numbers of third year physics students (1968-1993)*



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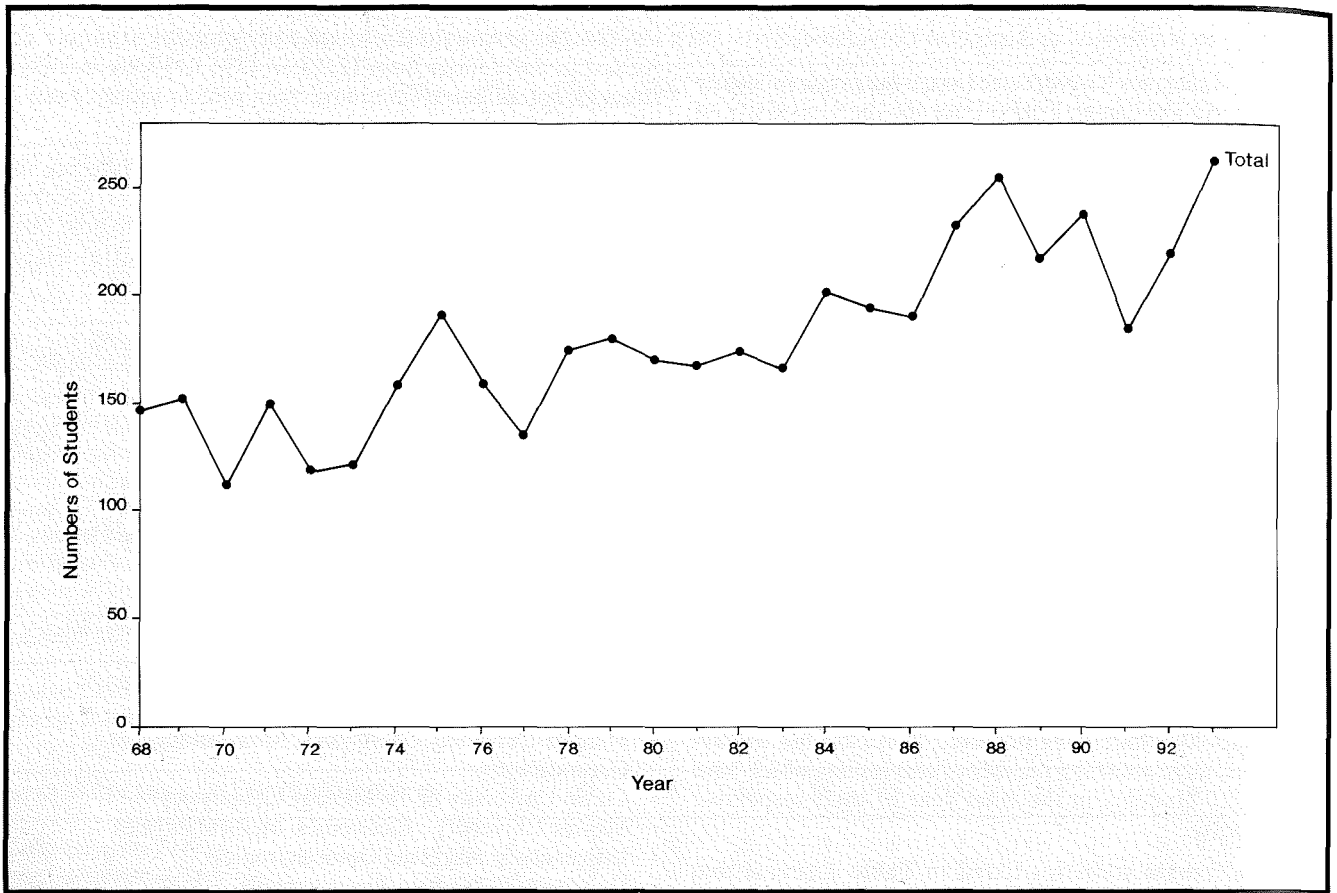
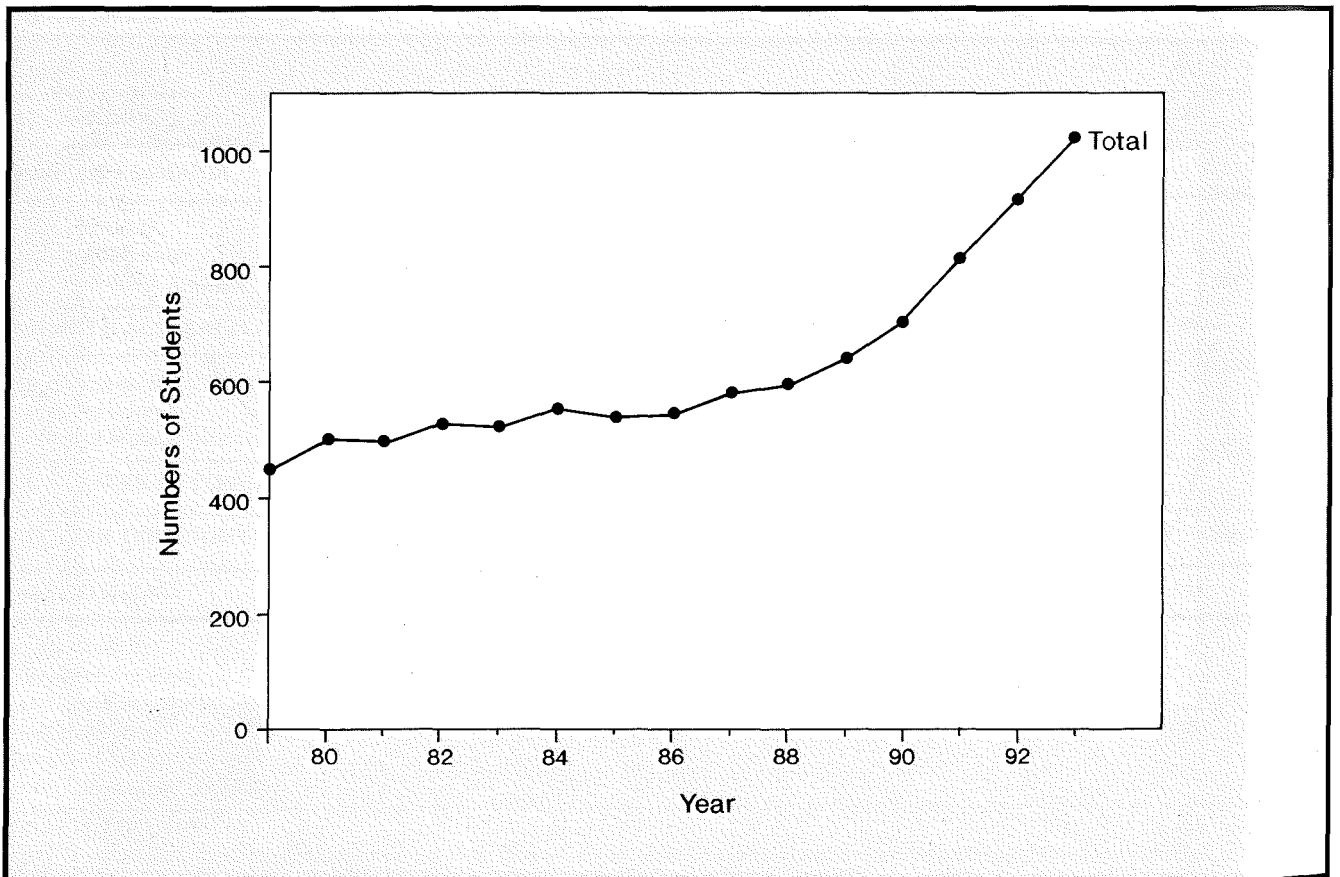


Figure 2 (above) Numbers of fourth year physics students (1968-1993)

Figure 3 (below) Numbers of postgraduate physics students (1979-1993)



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**TABLE 2 NUMBERS OF FOURTH YEAR PHYSICS STUDENTS 1983 - 1993
HONOURS, GRADUATE DIPLOMA AND MASTER'S PRELIMINARY**

	1983	1984	1985	1986	1987	1988	1989	1990	1991		1992		1993	
									M	F	M	F	M	F
Griffith University	3	2	0	7	6	5	10	3	5	1	5	1	6	1
James Cook University	3	5	2	2	2	1	4	7	0	1	1	0	2	0
Queensland University of Technology	10	12	2	12	9	0	0	0	0	0	0	0	0	0
University College of Central Queensland	-	-	-	-	-	-	-	20	1	0	4	1	0	0
University of Queensland	10	9	8	8	13	12	11	10	7	1	12	3	12	0
Total QUEENSLAND	26	28	12	29	30	18	25	40	16		27		21	
Macquarie University	3	3	5	1	2	2	2	1	3	1	1	0	7	2
University of Newcastle	1	5	4	4	3	1	3	1	3	0	1	0	3	0
University of New England	1	3	3	5	4	2	4	6	1	0	3	0	5	0
University of New South Wales	10	15	17	10	13	14	14	9	11	4	10	4	11	1
University of Sydney	6	7	7	9	23	21	15	13	17	2	17	2	17	4
University of Technology, Sydney	10	12	11	12	13	12	11	6	6	2	1	2	2	1
University of Western Sydney	-	-	-	-	-	-	-	-	0	0	0	0	3	2
University of Wollongong	0	0	0	2	3	2	5	3	3	2	5	1	5	1
Total NEW SOUTH WALES	31	45	47	43	61	54	54	39	55		47		64	
Australian Defence Forces Academy	3	1	2	3	2	1	1	0	1	0	0	0	1	0
Australian National University (The Faculties)	7	11	12	5	9	11	3	14	9	2	7	1	7	2
University of Canberra	-	-	-	-	-	-	-	1	5	1	4	1	6	0
Total AUSTRALIAN CAPITAL TERRITORY	8	12	14	8	11	12	4	15	18		13		16	
La Trobe University	2	2	3	2	2	9	2	6	2	1	3	0	7	1
Monash University	7	14	12	4	9	10	5	12	8	3	9	3	9	2
Royal Melbourne Institute of Technology	-	-	4	3	2	0	0	0	0	0	7	1	10	0
Swinburne Institute of Technology	14	23	19	18	36	79	40	43	7	3	13	6	16	11
University of Melbourne	21	16	15	18	22	18	16	23	8	3	16	4	22	0
Victoria University	-	-	-	-	-	-	-	-	0	0	0	0	5	0
Total VICTORIA	46	55	54	45	71	116	63	84	35		62		83	
University of TASMANIA	6	3	13	6	4	4	4	4	10	3	5	0	5	2
Flinders University	2	5	4	0	7	13	14	12	8	1	4	0	3	0
University of Adelaide	8	10	6	10	6	15	13	12	11	1	12	1	13	2
University of South Australia	0	0	0	0	0	0	0	0	0	0	1	2	2	1
Total SOUTH AUSTRALIA	14	15	10	10	13	28	27	24	21		20		21	
Curtin University of Technology	25	30	32	39	28	15	22	11	13	0	21	3	21	4
Murdoch University	2	3	1	3	3	3	10	12	6	0	9	5	11	5
University of Western Australia	7	11	12	8	13	7	8	9	8	0	5	2	10	1
Total WESTERN AUSTRALIA	34	44	45	50	44	25	40	32	27		45		52	
Total AUSTRALIA	165	202	195	191	234	257	217	238	185		219		264	
Massey University	-	-	-	-	-	-	-	-	4	1	4	1	4	1
University of Auckland	-	-	-	-	-	-	-	-	6	2	5	0	15	0
University of Canterbury	-	-	-	-	-	-	-	-	17	3	17	3	11	2
University of Otago	-	-	-	-	-	-	-	-	9	1	16	4	13	5
University of Waikato	-	-	-	-	-	-	-	-	8	1	6	0	12	0
Victoria University of Wellington	-	-	-	-	-	-	-	-	5	0	4	0	4	1
Total NEW ZEALAND									57		60		68	

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TABLE 3 NUMBER OF POSTGRADUATE PHYSICS STUDENTS 1983 - 1993
MASTER'S AND PhD STUDENTS

1983	1983	1984	1985	1986	1987	1988	1989	1990	1991		1992		1993	
									M	F	M	F	M	F
Griffith University	4	7	11	7	6	11	10	13	7	0	8	0	8	0
James Cook University	5	5	7	8	5	5	5	7	9	2	17	2	22	2
Queensland University of Technology	20	23	18	30	35	35	36	52	33	22	32	24	36	27
University of Central Queensland	-	-	-	-	-	-	-	2	1	0	0	0	1	0
University of Queensland	18	24	19	18	23	18	21	33	39	2	37	3	40	5
Total QUEENSLAND	47	59	55	63	69	69	72	107	115		123		141	
Macquarie University	14	17	21	26	30	32	34	34	42	12	44	17	40	10
University of Newcastle	5	4	3	4	8	12	10	14	9	1	15	1	13	1
University of New England	8	7	8	9	8	7	8	9	9	1	7	1	8	1
University of New South Wales	73	82	67	68	71	58	49	55	45	9	50	13	57	18
University of Sydney	29	35	35	21	22	37	48	58	56	8	62	10	67	15
University of Technology, Sydney	4	6	6	5	6	6	11	14	14	3	19	4	19	4
University of Western Sydney	-	-	-	-	-	-	-	-	2	0	4	1	6	1
University of Wollongong	5	3	2	2	5	7	11	14	11	2	14	2	12	1
Total NEW SOUTH WALES	138	154	142	135	150	159	171	198	224		264		273	
Australian Defence Force Academy	13	12	12	9	9	6	6	5	8	1	7	1	8	1
Australian National University (The Faculties)	5	5	5	6	7	9	10	12	12	1	12	2	12	2
Australian National University (RSPS)	62	67	55	54	52	51	53	59	68	7	77	10	97	12
University of Canberra	-	-	-	-	-	-	2	1	-	-	-	-	-	-
Total AUSTRALIAN CAPITAL TERRITORY	70	74	64	69	68	66	71	77	97		109		132	
Chisholm Institute of Technology	4	5	5	11	10	12	13	13	-	-	-	-	-	-
Deakin University	0	0	0	0	1	1	1	-	0	0	0	0	0	0
La Trobe University	17	18	22	16	21	28	29	28	20	3	20	4	18	3
Monash University	32	30	34	34	32	29	36	35	54	2	56	3	56	4
Royal Melbourne Institute of Technology	16	12	15	16	18	17	25	27	25	8	23	8	23	9
Swinburne Institute of Technology	3	2	3	7	7	4	6	10	15	2	24	2	40	5
University of Melbourne	49	57	67	74	74	78	82	77	78	6	71	6	73	11
Victoria University	-	-	-	-	-	-	-	-	3	0	8	1	14	1
Total VICTORIA	131	134	154	158	163	169	192	190	216		226		257	
University of TASMANIA	26	24	18	14	11	17	15	14	12	1	11	1	11	2
Flinders University	19	20	20	22	19	18	23	24	24	7	27	7	26	6
University of Adelaide	30	29	31	22	28	31	31	39	36	3	39	3	48	6
University of South Australia	5	8	6	5	5	8	10	9	8	2	10	3	14	4
Total SOUTH AUSTRALIA	54	57	57	49	52	57	64	72	80		89		104	
Curtin University of Technology	24	22	16	22	29	24	23	23	33	2	48	6	51	7
Murdoch University	7	8	5	4	6	11	12	14	10	1	9	2	10	2
University of Western Australia	26	24	27	29	32	19	17	13	26	4	27	4	26	5
Total WESTERN AUSTRALIA	57	54	48	55	67	54	52	50	76		96		101	
University of NORTHERN TERRITORY									2	1	1	1	1	1
Total AUSTRALIA	523	556	538	543	580	591	637	708	824		921		1023	
Massey University	-	-	-	-	-	-	-	-	5	0	7	1	8	1
University of Auckland	-	-	-	-	-	-	-	-	21	2	31	2	38	5
University of Canterbury	-	-	-	-	-	-	-	-	17	5	23	5	23	2
University of Otago	-	-	-	-	-	-	-	-	22	3	19	1	16	3
University of Waikato	-	-	-	-	-	-	-	-	21	1	18	1	22	1
Victoria University of Wellington	-	-	-	-	-	-	-	-	6	2	7	2	8	2
Total NEW ZEALAND									105		117		129	

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TABLE 4 NUMBER OF HONOURS GRADUATES 1990 - 1992

	1990		1991		1992	
	M	F	M	F	M	F
Griffith University	3	0	5	1	4	1
James Cook University	0	2	3	2	0	1
University of Central Queensland	0	0	0	0	1	0
University of Queensland	7	2	7	1	11	3
Total QUEENSLAND	14		19		21	
Macquarie University	0	0	1	1	0	0
University of Newcastle	3	0	1	0	3	0
University of New England	1	0	1	1	0	0
University of New South Wales	12	2	7	2	6	2
University of Sydney	16	2	18	1	12	3
University of Technology, Sydney	1	0	6	2	1	2
University of Wollongong	2	0	2	1	2	0
Total NEW SOUTH WALES	39		44		31	
Australian Defence Force Academy	0	0	1	0	0	0
Australian National University (The Faculties)	14		9	2	7	1
Total AUSTRALIAN CAPITAL TERRITORY	14		12		8	
La Trobe University	5	1	2	1	2	0
Monash University	9	1	9	1	6	2
University of Melbourne	20	3	8	2	15	4
Total VICTORIA	39		23		9	
University of TASMANIA	3	0	8	2	2	0
Flinders University	10	2	8	1	4	0
University of Adelaide	9	3	11	1	12	1
University of South Australia	0	0	0	0	1	2
Total SOUTH AUSTRALIA	24		21		20	
Curtin University of Technology	9	0	4	2	8	0
Murdoch University	2	2	2	0	3	3
University of Western Australia	8	0	8	0	4	2
Total WESTERN AUSTRALIA	21		16		0	
Total AUSTRALIA	154		145		131	
Massey University	4	0	2	1	3	0
University of Canterbury	7	1	13	3	13	3
University of Otago	7	1	4	1	6	3
Victoria University of Wellington	4	0	2	0	4	0
Total NEW ZEALAND	24		26		32	

The numbers for the above courses have been included in the data listed in Table 1. There are other courses, such as Radiography and Teacher Education, which have a significant physics content, but these have not been listed. A number of universities offer a joint degree in physics and astronomy, but these have not been distinguished separately in the above list. All the numbers listed in the tables refer to the actual number of students and not to Equivalent Full Time Students (EFTS).

Fourth Year Enrolments

The data for fourth year enrolments from 1983 to 1993 are given in Table 2 and the trends in these enrolments from 1968-1993 are shown for Australian students in Figure 2. The fourth-year enrolments include honours, postgraduate diploma and preliminary masters students. The Australian numbers have averaged 223 per year over the past three year period, as compared to an average of 237 per year over the period 1988-1990. At the present time the retention rate from third-year to fourth-year studies in physics is approximately 37% in Australia as compared to approximately 35% in the early 1980's, but somewhat lower than in the late 1980's. Again the number of fourth-year students in some of the institutions is extremely small. None of the institutions has closed down their fourth-year courses over the past three years and two universities (The University of Western Sydney and the University of South Australia), have commenced programs at this level.

All six New Zealand universities which offer undergraduate physics programs also have fourth-year programs. The average number of fourth-year students over the period 1991-1993 is 56 per year, which compares to a corresponding number of 223 per year in the Australian universities. Thus there are approximately 4.0 times as many fourth-year students in Australia as in New Zealand, as compared to a factor of approximately 5.1 at the third-year level. This implies that the retention rate in New Zealand is slightly higher than in Australia (43.5% as against 37.2%).

The male/female statistics listed in Table 2 reveal that approximately 18% of the fourth year physics enrolments in Australia are female as compared to 16% in New Zealand. The proportion of females at fourth-year level is therefore larger than at the third-year level in both Australia and New Zealand.

Postgraduate Enrolments

The data on Masters and Ph.D enrolments are presented in Table 3 for Australia and New Zealand and in Figure 3 for Australia. Although most of the students are research students, the statistics also include Masters by coursework students. In the last survey (Jennings and De Laeter, 1991), we noted the dramatic increase in postgraduate enrolments which had occurred over the past decade. This growth has continued from 1991 to 1993, with an average enrolment of 923 per year as compared to an average enrolment of 645 per year over the period 1988-1990. This compares to an average of 124 postgraduate student enrolments per year in New Zealand over the period 1991-1993. There are therefore

almost 7.5 times as many postgraduate students enrolled in Australian universities as compared to New Zealand.

The proportion of female postgraduate students has increased from 13.7% in 1991 to 16.2% in 1993, with an average value of 15.2% over this period. However, it is too early to analyse trends in gender balance. The average female enrolment in New Zealand for postgraduate students over the period 1991-1993 is 10.5%.

The proportion of overseas postgraduate students varies considerably amongst institutions. There is no particular pattern in these enrolments, but the average for all Australian Universities is 22.4% overseas postgraduate students. In New Zealand the proportion of overseas students is smaller, and the average for all institutions is 12.7%.

Graduate Statistics

Information on the number of Honours graduates from 1990 to 1992 was collected for the first time this year and these are listed in Table 4. Twenty-two Australian universities graduated an average of 146 Honours students per year over this period, whilst four New Zealand universities graduated an average of 27 students per year. Australia therefore produces approximately 5.4 times the number of Honours graduates as does New Zealand. The average female proportion of Honours graduates from 1990 to 1992 was 17.2% for Australia and 15.9% for New Zealand. The average number of Honours graduates per university over the two countries is only 6.7 per year.

The number of Masters graduates (coursework and research) from 1982 to 1992 is listed in Table 5. The number of graduates has increased from an average of 28 per annum from 1982-1989 to 48 per annum from 1990-1992. The number of Masters graduates is dominated by the Queensland University of Technology which has graduated 76 students over the last three years. New Zealand has produced an average of 23 Masters graduates per year over the past three years, so that Australia only produces approximately twice the number of Masters graduates as does New Zealand. In terms of gender balance the average proportion of female graduates has been 38% in Australian Universities over the period 1990-1992, as compared to approximately 16% in New Zealand Universities.

An analysis of the number of Ph.D graduates in Table 6 over the three year period 1990-1992, reveals that an average of 62 students per year graduated over this period as compared to 10 graduates per year in New Zealand. Thus Australia graduates approximately six times as many Ph.D students as New Zealand, although the differential is only two to one at the Masters level. The proportion of female Ph.D graduates is very small - an average of 6% in Australia and 12% in New Zealand over the period 1990-1992. This is in marked contrast to the situation for Masters graduates where females comprised 38% of the group in Australia. The number of Ph.D graduates in Australia has remained steady at approximately 58 graduates per year over the last ten years but there are indications that this number will increase in the future. Twenty Australian Universities have graduated Ph.D students over the past decade, with two new institutions, The University of Technology, Sydney and Royal Melbourne ▶

PHYSICS ENROLMENTS IN AUSTRALIAN AND NEW ZEALAND UNIVERSITIES

TABLE 5 NUMBER OF MASTER'S GRADUATES 1982 - 1992

	1982	1983	1984	1985	1986	1987	1988	1989	1990		1991		1992	
									M	F	M	F	M	F
Griffith University	0	0	0	1	1	2	0	1	0	0	0	0	0	0
James Cook University	1	0	0	0	0	3	0	0	0	0	1	0	0	0
Queensland University of Technology	2	4	4	2	5	3	9	10	13	15	9	15	10	14
University of Central Queensland	-	-	-	-	-	-	-	-	0	0	1	0	0	0
University of Queensland	0	1	0	0	1	2	1	1	0	0	0	0	0	0
Total QUEENSLAND	3	5	4	3	7	9	12	11	29		26		24	
Macquarie University	1	5	4	0	0	0	2	2	1	1	1	0	2	0
University of Newcastle	0	0	1	0	0	0	0	0	0	0	0	0	0	2
University of New England	0	0	0	0	1	0	0	0	0	0	0	0	1	0
University of New South Wales	3	0	1	4	1	4	3	1	0	0	1	0	1	0
University of Sydney	2	1	1	0	1	1	1	1	0	0	1	0	3	0
University of Technology, Sydney	1	1	2	1	1	1	1	2	0	0	1	0	0	0
University of Wollongong	0	2	1	0	0	0	0	0	0	0	0	0	0	0
Total NEW SOUTH WALES	7	9	10	5	4	6	7	6	2		4		9	
Australian Defence Force Academy	1	0	1	0	0	0	0	0	0	0	0	0	0	0
Australian National University (The Faculties)	0	0	0	1	0	0	0	0	1	0	0	0	0	0
Australian National University (RSPS)	0	0	0	2	1	1	0	1	0	0	1	0	0	1
Total AUSTRALIAN CAPITAL TERRITORY	0	0	0	3	1	1	0	1	1		1		1	
Chisholm Institute of Technology	1	2	1	2	0	0	1	3	-	-	-	-	-	-
La Trobe University	2	0	2	0	0	1	0	1	0	0	4	0	0	0
Monash University	1	1	1	0	1	0	0	1	0	0	0	0	1	0
Royal Melbourne Institute of Technology	5	3	5	3	0	0	1	0	2	0	2	0	0	0
Swinburne Institute of Technology	0	0	1	0	2	0	1	1	0	0	0	1	0	0
University of Melbourne	2	4	2	3	1	3	1	2	0	0	0	1	4	1
Total VICTORIA	12	9	13	8	4	4	4	8	2		8		6	
University of TASMANIA	0	0	1	1	3	0	0	0	0		0		2	
Flinders University	0	0	0	0	0	2	0	0	0	0	0	0	1	0
University of Adelaide	4	1	0	2	2	1	1	0	0	0	1	0	6	1
University of South Australia	0	1	1	3	1	0	0	0	0	0	2	0	3	0
Total SOUTH AUSTRALIA	4	2	1	5	3	3	1	0	0		3		11	
Curtin University of Technology	2	2	1	1	4	1	4	3	7	0	3	1	4	0
University of Western Australia	0	0	0	0	0	2	2	1	0	0	0	0	1	0
Total WESTERN AUSTRALIA	2	2	1	1	4	3	6	4	7		4		5	
Total AUSTRALIA	28	27	30	26	26	26	30	30	41		46		58	
Massey University	-	-	-	-	-	-	-	-	0	0	0	0	1	0
University of Auckland	-	-	-	-	-	-	-	-	8	2	4	2	6	0
University of Canterbury	-	-	-	-	-	-	-	-	3	1	1	1	5	2
University of Otago	-	-	-	-	-	-	-	-	2	2	8	1	3	0
University of Waikato	-	-	-	-	-	-	-	-	6	0	3	0	5	0
Victoria University of Wellington	-	-	-	-	-	-	-	-	2	0	2	0	0	0
Total NEW ZEALAND									26		22		22	

PHYSICS ENROLMENTS IN AUSTRALIAN AND NEW ZEALAND UNIVERSITIES

TABLE 6 NUMBER OF PhD GRADUATES 1989 - 1992

	1982	1983	1984	1985	1986	1987	1988	1989	1990		1991		1992	
									M	F	M	F	M	F
Griffith University	3	1	0	0	1	1	1	1	3	0	0	0	0	0
James Cook University	0	0	0	0	1	0	2	0	0	0	0	0	1	0
University of Queensland	1	2	2	0	3	2	6	1	0	0	1	0	4	0
Total QUEENSLAND	4	3	2	0	5	3	9	2	3		1		5	
Macquarie University	1	1	2	3	3	1	3	0	2	0	2	0	5	1
University of Newcastle	0	2	3	2	0	0	0	1	0	0	1	0	5	0
University of New England	1	2	0	1	1	2	2	2	0	0	0	0	2	0
University of New South Wales	7	6	6	6	7	7	5	10	5	0	6	0	5	0
University of Sydney	2	6	1	4	10	2	5	5	2	0	5	1	4	2
University of Technology, Sydney	-	-	-	-	-	-	-	-	1	0	0	0	1	0
University of Wollongong	0	1	1	0	0	0	1	0	0	0	0	0	2	1
Total NEW SOUTH WALES	11	18	13	16	21	12	16	18	10		15		28	
Australian Defence Force Academy	2	3	1	3	1	0	1	1	0	0	0	0	3	0
Australian National University (The Faculties)	0	0	2	0	1	0	2	2	1	0	1	0	0	0
Australian National University (RSPS)	12	21	8	8	9	7	9	16	8	0	10	1	13	1
Total AUSTRALIAN CAPITAL TERRITORY	14	23	10	9	11	7	12	19	9		12		17	
La Trobe University	2	3	1	3	3	2	2	2	1	1	1	1	2	1
Monash University	5	4	6	4	4	4	4	4	2	0	3	0	3	0
Royal Melbourne Institute of Technology	-	-	-	-	-	-	-	-	0	0	3	0	2	0
University of Melbourne	9	6	3	7	7	8	7	9	14	0	6	0	6	0
Total VICTORIA	16	13	11	16	14	13	13	15	18		14		14	
University of TASMANIA	2	3	3	1	2	4	2	1	2	0	4	0	2	0
Flinders University	2	2	4	3	2	3	5	6	7	0	1	2	2	1
University of Adelaide	2	5	4	2	3	1	2	2	3	0	3	0	3	0
Total SOUTH AUSTRALIA	4	7	8	5	5	4	7	8	10		6		6	
Murdoch University	1	1	0	1	0	1	1	1	2	0	2	0	1	0
University of Western Australia	4	3	1	1	3	6	4	1	1	0	1	0	3	0
Total WESTERN AUSTRALIA	5	4	1	2	3	7	5	2	3		3		4	
Total AUSTRALIA	56	71	48	49	61	51	64	65	55		55		76	
Massey University	-	-	-	-	-	-	-	-	2	0	0	0	1	0
University of Auckland	-	-	-	-	-	-	-	-	2	0	2	0	2	0
University of Canterbury	-	-	-	-	-	-	-	-	4	0	3	0	1	2
University of Otago	-	-	-	-	-	-	-	-	1	0	0	0	1	0
University of Waikato	-	-	-	-	-	-	-	-	3	0	2	0	0	0
Victoria University of Wellington	-	-	-	-	-	-	-	-	1	1	1	0	0	0
Total NEW ZEALAND									14		8		7	

Institute of Technology, graduating Ph.D's for the first time in the last three years.

Conclusions

The Australian Research Council report (1993) on the status of physics in Australia made the statement that:- "The numbers who wish to do physics at tertiary level have declined, there are fewer graduate students, and a corresponding decline in academic staff. The number of physics graduates is now about half the peak which occurred in the 1970's".

This does not reflect the situation revealed in this enrolment survey or for that matter in the previous survey by Jennings and De Laeter (1991). The enrolment statistics for students at the tertiary level demonstrate that numbers are now at a maximum level over the period of time that records have been kept.

The most pleasing feature of the present Australian statistics is the 32% increase in third year students over the period 1990 to 1993, and the 43% increase in postgraduate enrolments from the period 1988-1990, to the period 1991-1993. The number of Masters graduates has increased from an average of 28 per annum from 1982- 1989 to an average of 48 per annum from 1990-1992. On the other hand the number of fourth-year students and the number of Ph.D. graduates has remained essentially constant over the same period.

The enrolment statistics for New Zealand Universities have been included for the first time. Although the data is only available for the past three years, it reveals a consistent picture with an average of 128 third-year students over the period 1991-1993 (0.197 x the number of Australian students), 56 fourth-year students (0.250 x), and 124 postgraduate enrolments (0.134 x). In terms of graduates, New Zealand has produced an annual average of 27 Honours students over the period 1990-1992 as compared to 143 Australian Honours graduates (0.191 x), 23 Masters graduates (0.483 x) and 10 Ph.D graduates (0.156x).

Male/female statistics were collected for the first time, but only over the past three years. In Australia the proportion of female students is 15% (11%) for third-year students, 18% (16%) for fourth-year students and 15% (10.5%) for graduate students. The numbers in brackets refer to the proportion of female students in New Zealand. There is insufficient data to analyse trends in female physics enrolments, but this will be monitored in future surveys. An attempt has also been made to estimate the proportion of overseas research students. In Australia the proportion is approximately 22% as compared to 13% in New Zealand.

Acknowledgements

The authors are indebted to our colleagues in the various tertiary institutions who have kindly supplied us with the data and checked the tables for us. We would like to thank Ms L. Kirby who prepared the manuscript for publication.

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AUSTRALIAN NATIONAL UNIVERSITY POSTGRADUATE RESEARCH IN LASER PHYSICS

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