DEPARTMENT OF MATHEMATICS

ANNUAL REPORT 2002

PREAMBLE

The Department of Mathematics comprises over 70 established and temporary academic staff, based on two sites (the City campus and Tamaki campus). With the number of its equivalent full-time students totalling approximately 950 in 2002 the Department is one of the largest in the Faculty of Science and hence in the University of Auckland, offering courses at all levels for students in several Faculties.

Highlights for the Department in 2002 included a number of new appointments to the permanent staff.

- Professor James Sneyd, formerly of Massey University at Albany, took up the Chair in Applied Mathematics: Professor Sneyd is an expert in mathematical biology, particularly physiology.
- With strong support from the Dean who was concerned at the small number of senior staff in the Department, we appointed two new Associate Professors, Dr Eamonn O'Brien who was a Senior Lecturer in the Department and specialises in computational group theory and Dr Jozef Siran of Slovak Technical University, Slovakia, who specialises in combinatorics and graph theory. Associate Professor Siran will take up his position in the middle of 2003.
- Two new Lecturers took up their appointments. Dr Anthony Blaom with a PhD in geometry from California Institute of Technology and most recently from Princeton, arrived in July. Dr Warren Moors, who held a New Zealand Science and Technology Post-Doctoral Fellowship at Auckland in the 1990s, specialises in analysis and topology and was most recently a Senior Lecturer at Waikato University, arrived at the end of December.

In addition two further Senior Lecturers in the Department, Drs Jianbei An and Bruce Calvert, were promoted to Associate Professor at the end of the year.

Distinguished Alumni Professor Vaughan Jones was made an Honorary Member of the London Mathematical Society in March, and was appointed as Distinguished Companion of the New Zealand Order of Merit in August.

Two PhD graduates of the Department were awarded New Zealand Science and Technology Post-Doctoral Fellowships during the year. Dr Jiling Cao, who held a Post-Doctoral Fellowship of the Japan Society for the Promotion of Science and who specialises in topology and its applications, took up his fellowship in September. Dr Mark Harmer, who had been a temporary Lecturer in the Department and who specialises in scattering theory, operator theory and integrable systems, took up his fellowship at the end of the year.

Perhaps the greatest highlight, which the Department shared with others, was the naming of the New Zealand Institute of Mathematics and its Applications as one of the foundation Centres of Research Excellence. Members of the Department who were directly involved in the case for the award of this status were Professors John Butcher, Marston Conder, Vaughan Jones, Gaven Martin and James Sneyd. Professors Conder and Jones are the co-directors of the Institute. The Institute is jointly sponsored by the University of Auckland and the New Zealand Mathematics Research Institute (of which four of the five directors are members of the Department). Others directly involved in the establishment of the Institute came from the Departments of Engineering Science and Statistics, from Massey University, Victoria University of Wellington and Canterbury University, and from Industrial Research Limited.

The Department has two sub-units which operate with a degree of autonomy: the Applied Mathematics Unit and the Mathematics Education Unit. The former was re-established in 2002 and is headed by Professor Sneyd. The latter is headed by Dr Maxine Pfannkuch. Each unit is going through the process of selecting a new Lecturer. In addition the Department has advertised a new lectureship in Industrial Mathematics as part of the three-Department effort to revive the Industrial Mathematics programme.

During the year Dr Ganesh Dixit, the longest serving member of the permanent staff, retired. Dr Dixit joined the Department in 1968 after completing a PhD degree at Allahabad and lecturing there and in

Biafra. His research speciality is summability theory. Dr Dixit contributed his wisdom across the whole Department but especially in the area of analysis where he made major contributions to course structures as well as teaching the whole range of courses.

It is with regret that we note the passing of Emeritus Prof. Cecil Segedin. He was appointed a Lecturer in the Department in 1937 and later became the first Associate Professor in the Department before transferring to found the new Department of Theoretical and Applied Mechanics, later Engineering Science.

I. DEVELOPMENTS IN TEACHING

The Department of Mathematics provides teaching in papers for students in several faculties, notably Arts, Business & Economics, Engineering and Science.

For the 2002 academic year, student numbers totalled approximately 940 equivalent full-time students (EFTS), including 896 undergraduate EFTS (841 on the City campus and 55 at Tamaki), and just under 45 postgraduate EFTS. These numbers have been creeping up slightly in the last few years, following considerable increases in earlier years, and it is particularly pleasing that the significant growth in our postgraduate enrolments over recent years has been maintained. We anticipate approximately a similar number of EFTS in 2003. Numbers at Tamaki have fallen. Now that a clear plan for the future development of Tamaki is being prepared, the Department can at last formulate its own plans for its contributions to the Campus. In particular the joint effort with the Departments of Engineering Science and Statistics to revive the Industrial Mathematics programme has now begun.

The Teaching Co-ordinator, Dr Paul Hafner, had a busy year bringing together a number of reviews of our undergraduate offerings. While the reviews have resulted in proposals for reductions in the numbers of our pure mathematics courses at all three undergraduate stages, the recommendations of the University's Curriculum Commission which appeared late in the year will need to be brought into any decisions we make as there is little point in introducing a new structure for 2004 if it is to be further changed in 2005. In the meantime I would like to record my appreciation of the considerable amount of work undertaken by those involved from identifying possible new courses to discussing proposed syllabi with representatives from a broad range of Departments whose students take our courses.

This year the Department was involved in the teaching of the new course PHYSICS 211 with the Physics Department. This is the third of a series of three special courses in mathematics for students in the experimental sciences. Though I have misgivings about duplication of courses, these courses do have an especially experimental flavour so may be justified on that ground.

The Department continues to offer MATHS 101 at Manukau Institute of Technology it does not receive EFTS credit for this course. It is very pleasing to note that the pass rate for the Manukau students was extremely high, with few withdrawals.

Summer Session: The Department offered three courses in the Summer Session. MATHS 208 continues to grow, with the enrolment about 350. Our original summer course, MATHS 108, continues to attract plenty of students and MATHS 102 is also growing. Although the main reason for introducing MATHS 102 pertained to EO matters (see further comments in Section IV below) this is also a valuable addition to our offerings.

Tutorial Help: Close scrutiny continues to be given to three of the most important interfaces with students, namely tutorials, the Department's Assistance Room, and the marking of assignments. Weekly small group tutorials are given in all of our Stage I Pure Mathematics courses. There are many practical problems in trying to arrange tutorials. The staffing issue can be addressed through the Faculty of Science when it is setting its budget. Much harder to address is the inadequacy of suitable tutorial rooms. In the event we have held small group tutorials all over the University. This is less than satisfactory with students having to hunt all over the institution, in frequently obscure locations. Even worse is that priority booking of these rooms for tutorials is not possible so we may even find that students are enrolled in a tutorial at a time when no

room is available. We appreciate the efforts by the Faculty to help us overcome this problem. Applied Mathematics is better served in this respect because we have our own computer laboratories under our own control (jointly with the Department of Statistics). Furthermore in the new year we will occupy new laboratories jointly with the Departments of Computer Science and Statistics.

The operation of the Assistance Room and the marking of assignments continue to work well and our standards are consistent. Tutors and markers involved are given appropriate training and support through workshops offered by the Centre for Professional Development and guidebooks produced by the Department.

A further innovation introduced during the year was the appointment of three experienced and very capable lecturers, Dr Hafner and Associate Professors Barton and O'Brien, as teaching advisors. Other lecturing staff may invite one or more of the advisors to attend their lectures following which the advisor will report on the presentation and recommend ways to improve it. The scheme has been used by a number of staff with significant benefits. Even a staff member from another Department took advantage of the service!

II. OTHER STUDENT MATTERS

Scholarships and Prizes

Senior Scholarship in Applied Mathematics	Erin Higgins, Mile Gu
Senior Scholarship in Mathematics	Matthew Auger, Robert Stafford
Annual Prize in Applied Mathematics	David Simpson
Annual Prize in Pure Mathematics	Michael Downward
Collins Prize in Mathematics	Richard Vale
Margaret Morton Prize	Carolyn Wheadon
Mathematics Education Prize	Garry Nathan

Summer Scholarships

21 students were engaged in research projects over the summer 2002-3, with scholarship support from the Department and the Faculty of Science. The basic aim of the scheme is to introduce senior undergraduates to mathematical research. Some others assisted staff with computational or practical aspects of individual research projects, or in the preparation of papers and other resource materials. This programme of summer scholarships has proved invaluable to both students and staff over the years and we hope to continue to be able to offer it in the future.

Aldis Scholarships

As part of its attempt to improve the recruitment and retention of Maori and Pasifika students, the Department with support from the Faculty continued its scholarships in honour of the second professor of Mathematics of Auckland University College, William Steadman Aldis, who was an outspoken supporter of equal opportunities in Auckland in the 1880s and 1890s. These scholarships are awarded to students who have just completed high school and enrol in MATHS 102 over the summer. More details about these appear in Section IV.

Student/Staff Liaison Committee

The Student/Staff Liaison Committee continues to be convened ably by Greg Oates. Indeed much of the credit for the Department winning the inaugural award for the best run Student/Staff Liaison Committee in the University by WAVE must go to Mr Oates. It met four times during the year, providing a successful means of two-way communication between students and staff in the Department on matters of common concern such as course and degree structures, and more general issues such as tutorial facilities and course assessment.

III. EEO & EEdO

The Department of Mathematics and its staff take their obligations to principles of Equal Employment Opportunity (EEO) and Equal Educational Opportunity (EEdO) seriously. Over recent decades the actions taken and decisions made by the Department have been with concern for the spirit of EEO and EEdO, and often initiatives have been taken specifically to deal with EEO and EEdO issues. In Section IV we indicate some of our Maori and Pasifika initiatives.

Recognising the disadvantages experienced by students of Chinese origins when they come to New Zealand and have to cope with a new culture and a new language as well as their studies we established tutorials given by tutors fluent in Mandarin and Cantonese. It is not our intention to conduct the tutorials in those languages; rather the tutor is able to resort to the appropriate language when necessary to explain a term, such as relating the term in English to an equivalent term in Mandarin. The co-ordinator of these tutorials, Associate Professor An, undertook a review of them this year and as a result further improvements were introduced.

The Department has few female members of the permanent staff: one full-time and a second who has a 50% appointment with each of the Departments of Mathematics and Statistics. This is regrettable but unfortunately is hard to rectify quickly. None of the candidates shortlisted for positions filled during the year were female. However the lectureship in Mathematics Education has been offered to a female candidate and nearly half of those candidates for the Applied Mathematics lectureship for whom referees' reports have been sought are female. Thus we are optimistic that over time the situation will improve.

The Department continues to run courses at foundation levels to meet the needs of students whose background in mathematics is weak. These include the University of Auckland Tertiary Foundation Certificate and the courses MATHS 101 and 102.

Staff from the Department continue to make visits to schools to encourage students into mathematics, particularly students from under-represented groups (see also Section IV). Also many EEdO issues have been discussed in our courses in Mathematics Education.

In addition to running courses for students without much background in mathematics, the Department offers advanced courses for more able or more qualified students, to meet their needs. The reviews undergraduate courses referred to above is also addressing what should be done for such students. We are especially keen to encourage such students to continue on to graduate studies in mathematics.

Further details may be found in the Appendix.

IV. TREATY OF WAITANGI

The Department takes seriously its Treaty obligations. Along with the Department of Statistics, with whom we cooperate closely, we are probably at the forefront in the Faculty with respect to initiatives.

Supported by the VC's Development Fund, the Faculty of Science's Equal Opportunity Initiatives and the Departments' own resources the Departments consolidated what they had already developed and took new steps.

- We appointed Mr Garry Nathan from Auckland College of Education as a senior tutor with responsibility for Maori students.
- We appointed Mr Viliami Latu of Tongan origins and formerly of Mt Roskill Grammar School as a senior tutor with responsibility for Pasifika students.
- Drs Sina Greenwood and Wiremu Solomon continued to oversee the Maori and Pasifika initiatives.
- The number of Aldis scholars increased to 17 and they continued to excel in their studies. Their grades in MATHS 102 were 7 A's, 5 B's, 3 C's and 2 fails. Not all qualified for entry to University from their 2001 Bursary examinations and in the end only 12 (8 excluding the Foundational studies students) continued with University studies in 2002. One Aldis scholarship student successfully completed 9 courses in 2002.

- Scholarships were offered to Maori and Pasifika students who got a B or better in a mathematics paper in Semester 1. This involved paying the fee for the next mathematics paper they enrolled in.
- Visits to schools were increased in numbers and intensity. Not all target schools are able to accommodate us. Others are so enthusiastic that they invite even their fifth and sixth form students to attend presentations to seventh form students. Our visits have widened to some West Auckland schools especially with a view to targeting more Maori students.
- The orientation programme, special tutorials and the mentoring system continue to operate successfully.

V. RESEARCH

1. GENERAL/HIGHLIGHTS

The Department of Mathematics has a very strong research programme, with several of its staff among the world leaders in their fields, and attracts a large number of visitors each year as well as an increasing number of postgraduate students and significant research awards and funding. We continue to receive many invitations to present plenary lectures at international conferences. Five successful grant applications involving seven staff as principal or associate investigators were made to the Marsden Fund.

Major research discoveries during the year included the following:

VII. With Professor Calude of the Department of Computer Science, Prof. Boris Pavlov considered computers with simultaneous multiple states operating upon quantum principles to show that a barrier to computation which was established by Turing in 1936 may be breached. This research featured as the cover story in NewScientist on 6 April.

VIII. Professor Gaven Martin announced the identification of the minimal co-volume tessellation of hyperbolic 3-space, a problem which was first suggested in 1942 but which has roots going back to 1892.

IX. Dr Arkadii Slinko established how the probability that a coalition may manipulate an election depends on the size of the manipulating coalition.

One measure of the Department's international research ranking is its hosting of international conferences. This year, in successive weeks, the Department hosted major conferences in Topology and Mathematics Education. The first of these, the 17th in a series of Summer Conferences on Topology and its Applications and only the second of the series to be held outside North America, presented an extra challenge for the organisers: it was held here in mid-winter! The second, sponsored by the Mathematics Education Research Group of Australasia, occurs annually and mostly is held in Australia. This was the second MERGA Conference to be held in New Zealand. There were other conferences too: the Foundation Mathematics Bridging Conference held in July, and the Annual New Zealand Mathematics Colloquium held in December.

Another measure is the large number of visitors who came from overseas to work with members of the Department or just to enjoy the lively atmosphere. Many stayed on after attending one or more of the conferences but many more came at other times. The list below includes 66 such visitors.

The Mathematics Education Unit continued to receive research grants from various sources, including the Woolf Research Centre and the Manukau City Council Promotion.

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O'BRIEN, E.A.: Cooperman, G., *Parallel GAP: mature interactive parallel computing*. Review in *Mathematical Reviews 2002d*: 20001, 2001.

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(G) Professional and technical reports

REILLY, I. 'Generalized closed sets: a survey of recent work'. *RIMS Kokyuroku 1248*, Research Institute for Mathematical Sciences, Kyoto University, Kyoto, Japan, 1-11, 2002.

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1. SHARP, P.W., VAILLANCOURT, R.[4] 'The error growth of some symplectic explicit Runge-Kutta Nystrom methods on long N-body simulations'. August 2002.

2. ARCHDEACON, D.[4], BONNINGTON, C.P. 'Obstructions for Embedding Cubic Graphs on the Spindle Surface'. May 2002.

3. BONNINGTON, C.P., TOMAZ P.[4] 'On the orientable genus of the cartesian product of a complete regular tripartite graph with an even cycle. May 2002.

4. BONNINGTON, C.P., RICHTER, R.B.[4] 'Graphs Embedded in the Plane with Finitely Many Accumulation Points. May 2002.

5. ARCHDEACON, D.[4], BONNINGTON, C.P., DEBOWSKY, M.[3], PRESTIDGE, M.[5] 'Halin's Theorem for the Möbius Strip'. May 2002.

6. MIKHAILOVA, A.[3], PAVLOV, B. 'Resonance Triadic Quantum Switch'. May 2002.

7. BAGRAEV, N.[3], MIKHAILOVA, A.[3], PAVLOV, B., PROKHOROV, L.[3] 'Resonance Quantum Switch and Quantum Gate'. May 2002.

8. REAMS, R.[3], and WALDRON, S. 'Isometric tight frames'. February 2002.

9. PAVLOV, B., POKROVSKIJ, A.[3], STREPETOV, A.[3] 'Quasi-Relativism, Narrow-Gap Property and Forced Dynamics of Electrons in Solids: Few Solvable Models'. August 2002.

10. MA'U, S. 'Maximal Embeddings of Directed Multi-Cycles'. February 2002.

11. TEE, G.J. 'Eigenvectors of Compound-Circulant and Alternating Circulant Matrices'. March 2002.

12. GOLUBYATNIKOV, V.P.[4], LIKHOSHVAI, V.A.[3] 'On modeling of amphibious population evolution'. August 2002.

13. TEE, G.J. 'Russian Peasant Multiplication and Egyptian Division in Zeckendorf Arithmetic'. August 2002.

14. SERTEL, M.[3], SLINKO, A. 'Ranking Committees, Words or Multisets'. June 2002. Also published: Nota di Laboro 50.2002. Center of Operation Research and Economics, The Fundazione Eni Enrico Mattei, Milan, 2002.

15. SLINKO, A. 'The Majoritarian Compromise in Large Societies'. August 2002.

16. SLINKO, A. 'On Asymptotic Coalitional Strategy-Proofness of Social Choice Rules under the IAC Assumption'. August 2002.

17. FOX, C., and CHUNG, H.[5] 'Harmonic Deflections of an Infinite Floating Plate'. August 2002.

18. SHARP, P.W., and KROGH, F.[3] 'DDAE: an integrator for ODEs, DAEs and DDEs, part I'. August 2002.

19. YASHIRO, T. 'A note on immersed 3-spheres in 4-space'. August 2002.

20. YASHIRO, T. 'Deformations of Surfaces in 4-space'. August 2002.

21. DUDLEY WARD, N.F. 'Asymptotic Balayage in Hardy and Bergman Spaces'. September 2002.

22. DUDLEY WARD, N.F. and FENTON, P.C.[3] 'Very regular zero sets for the Bergman Spaces'. September 2002.

23. SHOULI, J.[4], and YUMING, X.[3] 'On monotonically orthocompact spaces'. November 2002.

(K) Videotapes and films (that are substantial works of educational or scholarly value)

KING, C. 'Genesis of Eden' internet/CD diversity encyclopedia. 2002 editions a, b, c, d, and e. http://www.dhushara.com/book/genesis.htm

(L) Other Works

ADAM, S.[5], ALANGUI, A.[5], & BARTON, B. 'A Comment on Rowlands & Carson: Where would formal, academic mathematics stand in a curriculum informed by ethnomathematics? A critical review'. *Presented to a Seminar in Honour of Ubiratan D'Ambrosio, Sao Paulo, Brazil, December, 2002.*

MCNAUGHTON, A. 'Optimisation of forest harvesting subject to area-restrictions on clearfell'. *ORSNZ conference proceedings, November 2002*.

OATES, G. & THOMAS, M.O.J. 'Indicators for change: A report on the implementation of CAS calculators into a first year tertiary mathematics course'. In: M. Statham (ed.) *Proceedings of the 10th Australasian Bridging Mathematics Network Conference Auckland, 2002*, 130-139.

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TEE G.J., Euler on π^3 and π^5, *Mathematics Today, October*, 2002.

OTHER MATTERS RELATED TO RESEARCH ACTIVITIES

Diploma, Honours and Masters Students

Name	**Thesis Topic/Title**	**Supervisor(s)**
Cheng-Pei (Ruby) Chen	Applications of Trees to the Study of Runge Kutta Methods	Prof. John Butcher/Dr Robert Chan
Ying-Hsuan (Sophia) Chen	Sylow/Hall Structure of Sp_4(q)	Dr Jianbei An
	Algebraic Questions Arising from Runge-Kutta Methods	Prof. John Butcher
	Reading project - Topics in Complex Analysis	Assoc. Prof. M. Vamanamurthy
Daniel Friedrich	The Bernstein-Schoenberg Operator	Dr Shayne Waldron
Robert Goerke	Probabilistic Methods in Combinatorics	Dr Paul Bonnington
David Grant	Differential Geometry	Dr Rod Gover
Yi-Lin Ho	The Role of the Graphics Calculator in the Teaching & Learning of Secondary Mathematics	Dr Michael Thomas
Andrey Ivanov	Reding project - Social Choice	Dr Arkadii Slinko
Rula Jihad	Minor-minimal Non-outer Pants Graphs	Dr Paul Bonnington
	Reading project - Topics in Topological Graph Theory	Dr Paul Bonnington
	Reading project - Number Theory	Dr David Smith
Viliami Latu	Motivating Year 13 Mathematics Students; A Case Study	Dr Bill Barton
Paul Leys		Prof. Boris Pavlov
Mark Liu	Linear Orderings of Multisets of Cardinality Three from a Set	Dr Arkadii Slinko

	of Four Elements	
	Reading project - Fingerprinting Codes	Dr Arkadii Slinko
	Reading project - Proofs from 'The Book'	Dr Paul Bonnington
Amy Maginess	NCEA Mathematics Assessment	Dr Maxine Pfannkuch
Sikimeti Ma'u	Reading project - Graph Theory & Combinatorics	Dr Paul Bonnington
	Project - Mathematical Physics	Prof. Boris Pavlov
Robert McKibbin	Reading project - Stochastic Differential Equations	Dr Steven Taylor
Rogani Naidoo	Evaluation of Stage One Statistics Course: Independent Learning	Dr Maxine Pfannkuch
Mala Nataraj	Vedic Mathematics	Dr Bill Barton
Gary Nathan	Enhancing Levels of Mathematical Thinking in Year 13 Students	Dr Bill Barton
Kieran Robert	Resonance Optical Switch: Calculation of Resonance Eigenvalues	Prof. Boris Pavlov
Nicole Roper	Evaluation of Stage One Statistics Course: Learning with technology	Dr Maxine Pfannkuch
Edward Rosser	Computational Inference in Electrical Impedance Tomography	Dr Colin Fox
Jonathan Sim	Saddle-node Hopf Bifurcations in a Physiological Model	Dr Vivien Kirk
Tony Simmiss	Reading project - Cryptography	Dr Arkadii Slinko
David Simpson	Reading project - Topics in Complex Analysis	Assoc. Prof. M. Vamanamurthy
Sepideh Stewart	Difficulties in the Acquisition of Linear Algebra Concepts	Dr Michael Thomas
Sanya Timarac	A Survey of Models and Numerical Techniques for Option Pricing	Dr Rod Gover/ Dr Wiremu Solomon
Richard Vale	Tight Frames and their Symmetries	Dr Shayne Waldron
	Reading project - Commutative Algebra	Dr David Smith
	Reading project - Functional Analysis	Prof. Boris Pavlov
Arnold Van Den Heuvel	Tutoring and Motivating Year 13 Students	Dr Bill Barton
Malcolm Walsh	Reading project - Topics in Complex Analysis	Assoc. Prof. M. Vamanamurthy
Shing-Shan Yim	Reading project - Set Theory	Dr David McIntyre
	Reading project - Proofs from 'The Book'	Dr Paul Bonnington

PhD Students

The following students completed their PhD degrees during the year.

Name	**Thesis Topic/Title**	**Supervisor(s)**
Hyuck Chung	Sea-ice dynamics	Colin Fox & Mike Meylan
Grant Emms	Active sound power absorbers: their effect on sound transmission through openings	Colin Fox

Current PhD students.

Name	**Thesis Topic/Title**	**Supervisor(s)**
Shehenaz Adam	Ethnomathematics in the Maldives Curriculum	Bill Barton & Maxine Pfannkuch
Willy Alangui	Mathematics and Culture	Bill Barton
Renu Choudhary	Functional Analysis	Bruce Calvert
Nicoleen Cloete	Probability theory and Stochastic Processes with application in population genetics and	Geoff Nicholls & Wiremu Solomon & Allen Rodrigo

	phylogenetic (Biological Sciences) inference	
Alan De Los Santos	Graphics Calculators in Mathematics Learning	Mike Thomas
David Godfrey	Learning Algebra: The Arithmetic-Algebra Interface	Mike Thomas & Kay Irwin (Education)
Jianhua (Jeff) Gong	Geometry & Analysis	Gaven Martin & Norm Levenberg
Gareth Hegarty	Control theory and partial differential equations	Stephen Taylor & Graeme Wake (Adviser)
Shirley Huang	Numerical Methods for ODEs	Robert Chan & John Butcher
Edward Huang	Representations of Finite Groups	Jianbei An & Eamonn O'Brien
Sanka Liyanage	Informal assessment of secondary school mathematics teachers	Mike Thomas and Kay Irwin
Sione Na'a-Pangai Ma'u	Pluripotential Theory	Norm Levenberg
Barbara Miller-Reilly	Affective change in adult students returning to the study of mathematics	Kay Irwin (Education) & Constance Brown (Statistics)
Nicolette Moir	Numerical Analysis	John Butcher & Robert Chan
Greg Oates	Technology and the Mathematics Curriculum	Mike Thomas & Bill Barton
Debasish Roy	Markov chain Monte Carlo algorithms, Bayesian Inference, Inverse problems	Geoff Nicholls & Colin Fox
Sasha Rubin	Topics in Computational Algebra	Eamonn O'Brien & Marston Conder & Bakhadyr Khoussainov (Computer Science)
Jamie Sneddon	Planar Infinite Graphs	Paul Bonnington
Angela Tsai	Applied Maths – Numerical Analysis	Robert Chan & John Butcher
Chung-Ju (Jeff) Tsai	Complex Analysis & Geometry	Gaven Martin & Norm Levenberg
Krasimira Tsaneva-Atanasova	Mathematical Biology	James Sneyd
Brian Van Dam	Topological Resolution Spaces	David Gauld & Mavina Vamanamurthy (Adviser)
William Wright	Numerical solution of differential equations	John Butcher & Robert Chan
Kaimin Zhang	The Representation of Finite Groups	Jianbei An & Eamonn O'Brien

Research Fellows & Visitors

Name	**Affiliation**
Majid M Ali	Sultan Qaboos University, Oman
Kari Astala	University of Helsinki
Dinna Balling	Aalborg University, Denmark
Dr Hannah Bartholomew	Kings College, London
Alan Beardon	Cambridge University
Toni Beardon	Cambridge University
Dr Anthony Blaom	Princeton
Prof. Christian Beck	Queen Mary University of London
Prof. Tom Berger	Colby College, Maine, USA
Fred Biddulph	Waikato University
Len Bos	University of Calgary
Tom Branson	University of Iowa
Chris Breen	Cape Town University
Kevin Burrage	University of Queensland
Prof. Jon Carlson	University of Georgia
Alan Champneys	Bristol University
Prof. Arjeh Cohen	Eindhoven University
Ian Cohen	KTH, Stockholm, Sweden

Prof. Szymon Dolecki	Université de Bourgogne, France
Dr Dane Flannery	University of Galway
Peter Fox	Texas Instruments, Australia
Prof. David Gao	Virginia Polytechnic Institute and State University
Paul Gartside	University of Pittsburg
Dr Jim Geelen	Waterloo University
Prof. Vladimir Golubjatnikov	Novosibirsk State University, Russia
Chris Good	University of Birmingham
C.R. Graham	University of Washington
Prof. Nora Hartsfield	Washington State University
Dr George Havas	University of Queensland
Prof. Derek Holt	University of Warwick
Stephen Joe	Waikato University
Prof. Jari Kaipio	Department of Applied Physics, University of Kuopio
Prof. James J. Kaput	University of Massachusetts, USA
Jacob Katzenelson	Technion – Israel Institute of Technology
Edgar Knobloch	Leeds University
Prof. Hans Peter Kunzi	University of Cape Town
Collete Laborde	IMAG, University of Grenoble, France
Prof. Charles Leedham-Green	University of London
Pierre Leone	University of Geneva
Prof. Kay Maagard	University of Detroit
Dr Janet McShane	Northern Arizona University
Dr Warren Moors	The University of Waikato
Dr Scott Murray	University of Sydney
Marian Neamtu	Vanderbilt University
Portia Neydorff	Texas Instruments, Australia
Prof. Tsugunori Nogura	Ehime University, Japan
Peter Nyikos	University of South Carolina
Prof. Mel Nyman	Alma College, Michigan, USA
Vladimir Olejnik	St Petersburg University
Prof. Reinout Quispel	La Trobe University
Prof. Neil Robertson	Ohio State University
Mary Jane Schmidtt	TERC, Boston, USA
Dr Csaba Schneider	University of Western Australia
Steffen Schulz	Humboldt Universität Zu Berlin
Prof. Akos Seress	University of Ohio
Dr Akiko Shima	Tokai University, Kanagawa, Japan
Prof. Jiang Shouli	Shandong University, Jinan, PR China
Prof. Jozef Siran	Slovak Technical University
Prof. James Sneyd	Massey University – Albany Campus
Prof. Mike Steel	University of Canterbury
Dr Benjamin Steinberg	Universidade do Porto, Portugal
Assoc. Prof. Ning-Chun Tan	National Taipei Teachers College, Taiwan
Prof. Carsten Thomassen	Denmark Technical University
Jane Watson	University of Tasmania
Norman Wildberger	UNSW
Prof. Rob Wilson	University of Birmingham

Seminars by Visitors, Honorary Research Fellows, Staff and Research Students

Prof. James Sneyd (Massey University, Albany Campus): A (somewhat mathematical) tale of two cells, two receptors and two waves
Prof. Vaughan Jones (Universities of Auckland and California at Berkeley): Two subfactors

Prof. David Gao (Virginia Polytechnic Institute and State University): Duality and Triality: Unifying Mathematics, Science and Engineering
Prof. Christian Beck (Queen Mary University of London): Generalized statistical mechanics and fully developed turbulence
Mark Holmes (University of British Columbia (UBC)): Self avoiding walks and percolation
Prof. Reinout Quispel (La Trobe University): Geometric Numerical Integration Methods
Prof. David Epstein (Warwick University): The logarithmic spiral: counterexample to a conjecture of Thurston and Sullivan
Prof. Mel Nyman (Alma College, Michigan, USA): Assessing understanding in calculus or developing the "calculus sense"
Marian (Mike) Neamtu (Vanderbilt University): Shape preserving approximation
Dr Warren Moors (The University of Waikato): Some recent results concerning weak Asplund spaces
Dr Anthony Blaom (Princeton): The Geometry of Reconstruction in Hamiltonian Systems with Symmetry
Dr Mark Wilson (University of Auckland): Multivariate Generating Functions
Prof. James Kaput (University of Massachusetts-Dartmouth, USA):
Prof. Carsten Thomassen (Technical University of Denmark): On some fundamental properties of the Euclidean plane
Norman Wildberger (University of NSW): Hypergroups and Sums of Hermitian matrices
Manuel Lladser (Ohio State University): Parameter varying Fourier-Laplace integrals: some "2 to 3 degenerate case" applications
Anthony Lehmann (Swiss Centre for Faunal Cartography (CSCF)): GRASP: Generalized Regression Analysis and Spatial Prediction in Ecology
Prof. John Butcher (University of Auckland): Numerical methods for ordinary differential equations: a millenium survey
Dr Allison Heard (University of Auckland): Stability of Variable Stepsize Methods for Ordinary Differential Equations
Jeff Hunter (IIMS, Massey, Albany): Generalized Inverses and their Use in Stochastic Modelling
Nora Hartsfield (Western Washington University): Self-dual embeddings of strongly regular self-complementary graphs
Ildar Gabitov (Landau Inst Moscow/Theory Division Los Alamos): Modeling of ultrashort pulse dynamics in optical fibers with randomly varying characteristics
Dr Michael Thomas (University of Auckland): Learning mathematics with technology: Theoretical and empirical perspectives
Assoc. Prof. Eamonn O'Brien (University of Auckland): Effective algorithms for the study of modular representations
Dr Bruce Calvert (University of Auckland): Some analysis with networks
Garrett van Ryzin (Columbia University Graduate School of Business): Revenue Management under a General Discrete Choice Model of Consumer Behavior
Jozef Siran (Slovak Technical University): Links between graph theory, group theory, geometry, Riemann surfaces, and Galois theory
Dr Jianbei An (University of Auckland): Local Determination and a Conjecture in the Representation Theory of Finite groups
Dinna Balling (Danish Institute for Upper Secondary Education, University of Southern Denmark.): How do teachers in Denmark use the Graphing Calculator in Mathematics Education? A presentation of a PhD project.
Oleg Davydov (Justus-Liebig-Universität, Giessen, Germany): Approximation with smooth multivariate piecewise polynomials
Csaba Schneider (University of Western Australia): Permutation groups and Cartesian decompositions
Benjamin Steinberg (Universidade do Porto, Portugal): Some topological and geometric techniques in finite state automata theory
Alan Champneys (Engineering Mathematics, Bristol, UK): Non-local bifurcation of solitary waves for coupled Nonlinear Schrodinger equations
Professor Vitali Milman (Tel-Aviv University): Surprising geometric phenomena in high-dimensional convexity
Prof. John Butcher (University of Auckland): Numerical methods for ordinary differential equations: a millenium survey

Dr. Vladimir Obolonkin: Belarus and Chernobyl: Facts and Thoughts from a Statistician-Insider
Dr Michael O'Sullivan (Engineering Science, University of Auckland): A Polynomial-Time Method for Dynamic Programming over an Infinite Time Horizon
Prof. Vladimir Golubyatnikov (University of Novosibirsk): On Reconstruction of Multidimensional Objects from Tomography-Type Projection Data
Nicolette Moir (University of Auckland): A new 'fifth' order method for solving ordinary differential equations
Dr David McIntyre (University of Auckland): Topologizing a set to make a given function continuous
Robert McKibbin (Massey University, Albany): Immersion, dispersion, inertia 'n coercion - naturally
Prof. J A John (University of Waikato): Crossover Designs in Clinical Trials
Dr Tsukasa Yashiro (University of Auckland): Constructing Surface Knots
Stephen Joe (Mathematics, University of Waikato): Construction of quadrature rules for numerical integration in hundreds of dimensions
Kerry Richardson (Yokohama National University): Katetov's problem and Michael's question
Prof. Estate V. Khmaladze (Victoria University of Wellington): On Martingale Transforms and Goodness-of-Fit Methods in the General Regression Problem
Jianhua Gong (University of Auckland): Quasiconformally Homogeneous Manifolds
Les Foulds (University of Waikato): Bookmobile Routing and Scheduling in Buskerud County, Norway
Prof. Tom Berger (Colby College, Maine): Fascinating Geometry
Prof. Vladimir Golubyatnikov (University of Novosibirsk): Multidimensional cone-beam tomography algorithm
Prof. Tom Berger (Colby College, Maine): An Amazing Algorithm: Risch Integration
Dr Geoff Pritchard (Statistics, University of Auckland): The electricity seller's Psi
Paul Damien (University of Michigan): Stochastic Simulation
Prof. Peter Hunter (Bioengineering Research Group, University of Auckland): Modelling cell, tissue and organ function; an overview of the mathematical challenges
Dr. Gerald Cheang (Nanyang Technological University, Singapore): Beyond Black-Scholes
Assoc. Prof. Stefan Steiner (University of Waterloo, Ontario, Canada): Seven Habits of Highly Effective Industrial Problem Solvers: An Overview of Statistical Engineering (Shainin Methods)
Prof. Ivan Reilly (University of Auckland): Topological reflections on a Research & Study Leave
Dr Paul Bonnington and Jamie Sneddon (University of Auckland): Two topics in Graph Theory
Brent Carswell (University of Michigan): Invariant subspaces of the Hardy and Bergman spaces
Rachel Weir (University of Virginia): Extremal functions in weighted Bergman spaces
David R. Brillinger (University of California, Berkeley): Mutual Information: A unifying concept in random process
Michael D. Plummer (Vanderbilt University): On the connectivity of graphs embedded in surfaces
Prof. Hans-Peter A. Kunzi (University of Cape Town): Cocompactness and quasi-uniformizability of completely metrizable spaces
Colva Roney-Dougal (University of Sydney): The primitive permutation groups of degree less than 1000
Claude Belisle (Universite Laval, Canada): Convergence properties of hit-and-run samplers
Prof. Peter Nyikos (University of South Carolina): Classic Problems - 25 Years Later
Prof. Szymon Dolecki (University of Burgandy): Method of multisequences
Prof. Peter Nyikos (University of South Carolina): Type I Manifolds
Prof. Peter Nyikos (University of South Carolina):Linearly Lindelof Spaces
Scott Murray (University of Sydney): Computing in groups of Lie type
Ru-Shuo Sheu (Statistics, University of Auckland): Reservoir control problems
Prof. Arjeh Cohen (Eindhoven University): Making Mathematics More Meaningful by Computer Interaction
Prof. Colette Laborde (University Joseph Fourier and Institute for Teacher Education, Grenoble): Dynamic Geometry: creating effective interaction between students and core ideas in undergraduate mathematics
Prof. Paul Gartside (University of Pittsburg): (Yet) More on M1-M3.
Dr Arkadii Slinko (University of Auckland): Two solved and two unsolved combinatorial problems in voting theory
Prof. Tsugunori Nogura (Ehime University): Non normality numbers
Sharon Browning (Bioinformatics Research centre, North Carolina State): Pedigree genetic data analysis with crossover interference

Prof. Jiang Shouli (Shandong University): Filter-Frechet vs. Strongly filter-frechet
William Ugalde (The University of Iowa): Differential forms canonically associated to even-dimensional compact conformal manifolds
Prof. Charles Leedham-Green (Queen Mary, University of London): Recognition of matrix groups
Prof. Tsugunori Nogura (Ehime University): Spaces with maximal selections
Alona Ben-Tal (Bioengineering Institute, University of Auckland): Towards a mathematical model for the cardio-respiratory system
Dr Akiko Shima (Tokai University): The 2-twist-spun trefoil has the triple point number four.
Dr Arkadii Slinko (University of Auckland): Asymptotic properties of voting procedures
Edgar Knobloch (Department of Applied Mathematics, University of Leeds): Structurally stable heteroclinic cycles in Rayleigh Benard convection
Prof. Edgar Knobloch (Department of Applied Mathematics, University of Leeds): Bursts
Dr Akiko Shima (Tokai University): State-sum Invariants of Classical Knots
Dr Akiko Shima (Tokai University): On Surface-Knots
Dr Akiko Shima (Tokai University): The 2-twist-spun trefoil has the triple point number four.
Jim Geelen (NZMS Visiting Speaker) (University of Waterloo): An algebraic matching algorithm
Ezra Zeheb (Electrical Engineering, Technion): Control of Systems Under Uncertainty Condition
Don McNickle (Management, Canterbury): Some aspects of correlations in queues
Assoc. Prof. Mike Steel (University of Canterbury): Phylogenetic trees and rapidly evolving diseases
Prof. Derek Holt (University of Warwick): The Dehn Function of Nilpotent Groups
Paul Shorten (AgResearch, Ruakura): Population growth, spread and competition: from food/crop safety to GMO risk
Charles Semple (Mathematics and Statistics, Canterbury): Combining Evolutionary Trees with Dated Ancestors
Prof. Jon Carlson (University of Georgia (Athens)): Classification of Endo-trivial Modules
Golbon Zakeri (Engineering Science): Estimation of market distribution functions in the electricity market
Prof. Jon Carlson (University of Georgia (Athens)): Representation theory: the big picture
Dr Paul Hafner (University of Auckland): The graphs of Hoffman-Singleton and Higman-Sims
Dr Nicholas F. Dudley Ward (University of Auckland): The zero set problem for the Bergman spaces
Dr Jiling Cao (University of Auckland): Pseudocompact spaces and Ginsburg's questions
Sean Oughton (Mathematics, Waikato): Heating the solar atmosphere: from 6000 Kelvin to a million Kelvin using wave-driven turbulence
Prof. Rafail Khasminskii (Wayne State University):On-Line estimation of a smooth regression function
Dr Sina Greenwood (University of Auckland): Type I manifolds
Prof. David Vere-Jones: Entropy scoring revisited: a second look at assessing point process forecasts.
Will Wright (University of Auckland): General linear methods with inherent Runge-Kutta stability
Dr Paul Murrell (University of Auckland): STATS 220: Some Lessons Learned about Web-Based Teaching
Prof. David Gauld (University of Auckland): Long Line Knots
Prof. Raymond J. Carroll (Texas A&M University): Variability Is Not Always A Nuisance Parameter
Prof. David R. Brillinger (University of California, Berkeley): Risk Analysis in Geoscience and Remote Sensing
Robert G. Newcombe (University of Wales College of Medicine): Confidence Intervals for Proportions and Related Quantities
Prof. Paul Gartside (University of Pittsburg): Universal Functions and Metrization.
Dr Mark Clements (ANU): Lung cancer mortality prediction using multi-state population smoking models
S. Rauch-Wojciechowski (Department of Mathematics, Linköping University, Sweden): From Jacobi problem of separation of variables to theory of quasi-potential Newton systems
Prof. Harry Dym (Weizmann Institute): Reproducing kernels and inverse problems
Dr Hannah Bartholomew (King's College London): Meeting the needs of individuals: some dilemmas and tensions from individualised mathematics classrooms.
Dr Michael Thomas (University of Auckland): Learning mathematics with technology: Theoretical and empirical perspectives.
Dr Eamonn O'Brien (University of Auckland): Effective algorithms for the study of modular representations.
Dr Bruce Calvert (University of Auckland): Some Analysis with Networks.

Research Grants

CENTRES OF RESEARCH EXCELLENCE (CoRE) GRANT

Prof. Marston Conder, Prof Vaughan Jones, et al.	Establishment of NZ Institute of Mathematics and its Applications ($4429526)

MARSDEN FUND GRANTS

Prof. Gaven Martin	Analysis and Geometry ($173334)
Prof. Ivan Reilly, Assoc. Prof. Bill Barton	Language Dependence of Concepts in Mathematics ($204445)
Assoc. Prof. Jianbei An, Prof. Marston Conder, Assoc. Prof. Eamonn O'Brien	Effective Computational Approaches ($144000)
Dr Shayne Waldron	Surface Approximation and Visualisation ($100000)
Dr Rod Gover	Invariants in analysis and geometry ($298633)

OTHER EXTERNAL GRANTS

Dr Jiling Cao, Prof. David Gauld	Analytic Topology and its Applications, Foundation for Research, Science and Technology ($205111)

AUCKLAND UNIVERSITY STAFF RESEARCH GRANTS

Dr Rod Gover	Tractor calculus and the Poincare metric ($1500)
Dr Michael Thomas	Technology in the construction of a conceptual mathematics curriculum ($7159)
Dr Jianbei An et al	Visitor Prof. J Alperin ($4000)
Dr Shayne Waldron	Symmetries of tight frames ($4800)
Dr Arkadii Slinko	Exploratory data analysis of major social choice functions on a randomly generated population ($1600)

AUCKLAND UNIVERSITY GRADUATE RESEARCH GRANTS

Mr Chung-Ju Tsai	Discrete Groups ($2000)
Mr Jianhua Gong	Study of quasiconformally homogeneous manifolds
Mr William Wright	Construction of practical general linear methods ($2800)
Ms Nicolette Moir	Numerical methods for ordinary differential equations ($2800)
Mr Jamie Sneddon	Planar digraphs and tournaments ($2000)
Dr B. Barton, Dr M. Pfannkuch, Ms Shehenaz Adam	Ethnomathematics in the Maldivian curriculum: an inquiry ($2000)
Dr B. Barton, Mr Willy Alangui	A methodology for ethnomathematics ($2000)
Ms Nicoleen Cloete	Bayesian inference in estimating the selection coefficient of a population in a randomly changing environment ($2500)
Ms Junying Huang	Numerical solution of ordinary differential equations ($2000)

V. STAFF LEAVE AND CONFERENCES

Ms Shehenaz Adam	Foundation Mathematics Bridging Conference, Unitec, Auckland, 2002 Mathematics Education Research Group Australasia (MERGA 25), Auckland, 7-10 July International congress on ethnomathematics II, Ouro Preto, Brazil, 5-7 August NZ Mathematics Colloquium, Auckland, 2-5 December
Mr David Alcorn	NZ Mathematics Colloquium, Auckland, 2-5 December Eighth New Zealand Mathematics Research Institute meeting, Napier, 4-11 January
Dr Jianbei An	NZ Mathematics Colloquium, Auckland, 2-5 December
Assoc. Prof. Bill Barton	Mathematics Education in Society (MES#3), Copenhagen Mathematics Education Research Group Australasia (MERGA 25), Auckland, 7-10 July Second International Congress on Ethnomathematics, ICEM-2, Ouro Preto ICMI Comparative Study Conference, Hong Kong NZ Mathematics Colloquium, Auckland, 2-5 December
Dr Paul Bonnington	Com2MaC Conference on Graph and Combinatorics, Pohang, South Korea, July 7th-11th, 2002 The Second Workshop Symmetries in Graphs, Maps and Complexes, SIGMAC '02, Aveiro, Portugal, July 15-19 NZ Mathematics Colloquium, Auckland, 2-5 December
Prof. John Butcher	ANZIAM, Canberra, 5-8 February Conference on Scientific Computation, Geneva, 25-29 June NZ Mathematics Colloquium, Auckland, 2-5 December
Dr Bruce Calvert	NZ Mathematics Colloquium, Auckland, 2-5 December
Dr Robert Chan	NZ Mathematics Colloquium, Auckland, 2-5 December
Ms Nicoleen Cloete	Eighth New Zealand Mathematics Research Institute meeting, Napier, 4-11 January Annual New Zealand Phylogenetics Meeting, Whitianga, 17-22 February Stochastic Computation, Statistical and Applied Mathematical Science Institute (SAMSI), North Carolina, USA, 24 September-4 October NZ Mathematics Colloquium, Auckland, 2-5 December
Prof. Marston Conder	Eighth New Zealand Mathematics Research Institute meeting, Napier, 4-11 January Workshop on Phylogenetics, Whitianga, February Conference on Groups, Representations & Cohomology, Sth Hadley (MA), June 10th Anniversary of Fields Institute, Toronto, June 2nd Conference on Graphs, maps & Symmetries, Aveiro (Portugal), July NZ Mathematics Colloquium, Auckland, 2-5 December

Dr Colin Fox	First Pan-American/Iberian Meeting on Acoustics, Cancún, Mexico, 2-6 December
Prof. David Gauld	Eighth New Zealand Mathematics Research Institute meeting, Napier, 4-11 January 17th "Summer" Conference on Topology and its Applications, Auckland, 30 June-4 July New Zealand Mathematics Colloquium, Auckland, 1-5 December Visited Université de Bourgogne, Dijon, France, 14 September-10 October.
Dr Rod Gover	Australian Math. Soc. Annual Conference National Research Symposium on Geometric Analysis and Partial Differential Equations, Center for Mathematics and its Applications, ANU, Australia
Dr Sina Greenwood	17th "Summer Conference" on Topology and its Applications, Auckland, 30 June-4 July NZ Mathematics Colloquium, Auckland, 2-5 December
Dr Paul Hafner	NZ Mathematics Colloquium, Auckland, 2-5 December
Dr Allison Heard	NZ Mathematics Colloquium, Auckland, 2-5 December
Shih-chang (Edward) Huang	London Mathematical Society Durham Symposium on Representation of Finite Groups and Related Algebras, University of Durham, 1-11 July
Dr Vivien Kirk	NZ Mathematics Colloquium, Auckland, 2-5 December
Dr Gaven Martin	Probability and conformal maps, Tennerife
Dr David McIntyre	17th "Summer Conference" on Topology and its Applications, Auckland, 30 June-4 July
Ms Helen McKenzie	Foundation Mathematics Bridging Conference, Unitec, Auckland, 2002 NZ Mathematics Colloquium, Auckland, 2-5 December
Dr Alastair McNaughton	NZ Mathematics Colloquium, Auckland, 2-5 December ORSNZ
Ms Barbara Miller-Reilly	Research Pre-Session for the National Council of Teachers of Mathematics, Nevada, USA, 19-20 April National Council of Teachers of Mathematics (NCTM) Annual Conference, Nevada, USA, 22-24 April Adult Numeracy Network Meeting, Nevada, USA, 21 April Mathematics Education Research Group Australasia (MERGA 25), Auckland, 7-10 July Foundation Mathematics Bridging Conference, Unitec, Auckland, 2002
Dr Geoff Nicholls	Eighth New Zealand Mathematics Research Institute meeting, Napier, 4-11 January Annual NZ Phylogenetics meeting, Whitianga, 17-22 February ChronoBuild02, Gregynog, UK, 3-6 April

Mr Greg Oates	Mathematics Education Research Group Australasia (MERGA 25), Auckland, 7-10 July Foundation Mathematics Bridging Conference, Unitec, Auckland, 2002 NZ Mathematics Colloquium, Auckland, 2-5 December
Ms Judy Paterson	Mathematics Education Research Group Australasia (MERGA 25), Auckland, 7-10 July Mathematics Association of Victoria
Prof. Boris Pavlov	10th MEL-ARI/NID Workshop, Helsinki, Acad. of Finland, 1-3 July 'Schrödinger Operators' Conference, Bendlewo, Poland 11-19 May Conference on 'Waves in periodic and random media', Holyoake College, USA, 22-28 June Conference on 'Computational Problems of Spectral theory', Cardiff University, 22-27 July
Dr Maxine Pfannkuch	Mathematics Education Research Group Australasia (MERGA 25), Auckland, 7-10 July NZ Mathematics Colloquium, Auckland, 2-5 December
Prof. Ivan Reilly	Eighth New Zealand Mathematics Research Institute meeting, Napier, 4-11 January Spring Topology Conference, Austin, Texas, USA, March 2002 17th "Summer" Conference on Topology and its Applications, Auckland, 30 June-4 July. Mathematics Education Research Group Australasia (MERGA 25), Auckland, 7-10 July NZ Mathematics Colloquium, Auckland, 2-5 December
Mr Sasha Rubin	IEEE Symposium on Logic in Computer Science (LICS), Copenhagen, Denmark, 22-25 July Logic Colloquium 2002, Munster, Germany, 3-9 August
Dr Philip Sharp	Southern Ontario Numerical Analysis Day, Fields Institute, Toronto, April, 2002
Dr Arkadii Slinko	VI International Conference of the Society for Social Choice and Welfare, Caltech, Pasadena, July II International Conference of the Society for Economic Design (SED 2002), New York, July NZ Mathematics Colloquium, Auckland, 2-5 December
Mr Jamie Sneddon	SIGMAC'02 (Second Workshop on Symmetry in Graphs, Maps and Complexes), Aveiro, Portugal, 15-19 July NZ Mathematics Colloquium, Auckland, 2-5 December
Prof. James Sneyd	Santa Fe Institute, August, 2002
Dr Wiremu Solomon	Stochastic Processes & their Applications 28, Melbourne
Ms Moira Statham	Foundation Mathematics Bridging Conference, Unitec, Auckland, July Mathematics Education Research Group Australasia (MERGA 25), Auckland, 7-10 July Second Annual Conference of The New Zealand Association of Bridging Educators, UNITEC, Auckland, September NZ Mathematics Colloquium, Auckland, 2-5 December

Mr Roy Swenson	NZ Mathematics Colloquium, Auckland, 2-5 December
Dr Stephen Taylor	ANZIAM, Canberra, 5-8 February MISG (Mathematics in Industry Study Group), Adelaide, February NZ Mathematics Colloquium, Auckland, 2-5 December
Dr Michael Thomas	Mathematics Education Research Group Australasia (MERGA 25), Auckland, 7-10 July
Mr David Thomson	NZ Mathematics Colloquium, Auckland, 2-5 December
Krasimira Tsaneva-Atanasova	Manawatu-Wellington Applied Mathematics Conference Massey University, Palmerston North, 6 September NZ Mathematics Colloquium, Auckland, 2-5 December
Dr Shayne Waldron	Surface Approximation and Visualisation II, Westport, 19-22 February Conference on Constructive Function Theory, Varna, Bulgaria, 19-23 June
Dr Tsukasa Yashiro	17th "Summer" Conference on Topology and its Applications, Auckland, 30 June-4 July NZ Mathematics Colloquium, Auckland, 2-5 December
Mr Kaimin Zhang	NZ Mathematics Colloquium, Auckland, 2-5 December

VI. COMMUNITY SERVICE

Mr David Alcorn: Chairperson/Treasurer of the Mathematical Chronicle Committee, Chairperson and Acting-Treasurer of the New Zealand Journal of Mathematics Committee.

Assoc. Prof. Bill Barton: Member of the Management Committee of the NZ Centre for Latin American Studies, Member of NZIMA Centre of Research Excellence Panel for Interview, Member of the Organising Committee for MERGA 25 Conference, Member of the Organising Committee for REMARKABLE Conference, Executive Member of the New Zealand Mathematics Society, Member of Interview and Selection Committee for Prof. Education at Waikato University, UNITEC Promotion Reviewer.

Dr Paul Bonnington: Managing Editor of the Australasian Journal of Combinatorics (2001-), Vice President of the Combinatorial Mathematics Society of Australasia (Inc.), Associate Fellow of the Institute of Combinatorics and its Applications, Canada.

Assoc. Prof. Bruce Calvert: Member of the Organising Committee of NZ Mathematics Colloquium 2002.

Dr Robert Chan: Member of organising committee of ANODE2003 meeting, Member of NA programme committee of NZIMA.

Prof. Marston Conder: Director of NZ Institute of Mathematics & its Applications (Mathematical Sciences CoRE), Co-director (and Treasurer) of NZ Mathematical Research Institute, Convenor and member of RSNZ Academy Fellowship selection panel for Mathematical & Information Sciences, Chair of government working group on Performance-based Research Funding (PBRF), Member of Marsden Fund Council and Convenor of its Mathematical & Information Sciences Panel, Member of Top Achiever Doctoral Scholarships Advisory Committee, External member of Selection Committee for Dean of School of Computing and Mathematical Sciences at Waikato University.

Dr Colin Fox: Elected Fellow of the Acoustical Society of America, Scientific Committee for IAHR 2002, International conference in Dunedin, December 2002.

Dr Sina Greenwood: Member of the organising committee for the 17th "Summer" Topology Conference.

Prof. David Gauld: Director (and Secretary) of NZ Mathematics Research Institute, Member of the Committee overseeing the Summer Topology Conference Series.

Dr Allison Heard: Convenor of the Organising Committee of NZ Mathematics Colloquium 2002, Committee member of ANZIAM (NZ Branch).

Ms Barbara Miller-Reilly: Member of the Organising committee of the Australasian Bridging Mathematics Network Conference 2002 UNITEC Institute of Technology, Member of the Organising Committee of the Mathematics Education Research Group of Australasia (MERGA) 25, Conference.

Mr Greg Oates: Member of the Organising Committee for Tenth Australasian Bridging Mathematics Network Conference 2002, UNITEC Institute of Technology, Member of the Organising Committee of the Mathematics Education Research Group of Australasia (MERGA) 25, Conference, Member of the Organising Committee for DELTA '03, Queenstown.

Assoc. Prof. Eamonn A. O'Brien: Associate Editor (Group Theory) for Journal of the Australian Mathematical Society, Member of the GAP Council.

Dr Maxine Pfannkuch: Member of the Organising Committee of the Mathematics Education Research Group of Australasia (MERGA) 25, Conference.

Prof. Ivan Reilly: (Foundation) Chair of the NZ Mathematical Olympiad Committee, (Foundation) Chair of the NZ Mathematics Enrichment Trust

Dr Arkadii Slinko: Member of the Organising Committee of NZ Mathematics Colloquium 2002, Member of the NZ Mathematical Olympiad Committee, Organised the Auckland Mathematical Olympiad and the problem selection.

Prof. James Sneyd: Member of the Organising Committee of NZ Institute of Mathematics & its Applications (Mathematical Sciences CoRE).

Ms Moira Statham: Member of the Organising Committee for Tenth Australasian Bridging Mathematics Network Conference 2002.

Mr Roy Swenson: Member of the Organising Committee of NZ Mathematics Colloquium 2002.

Dr Michael Thomas: Convenor and Proceedings editor for the MERGA 25 conference held in Auckland in 2002, Proceedings Editor for Delta03, the Third Southern Hemisphere Conference on Undergraduate Teaching, Queenstown, 2003, Materials developer for NZQA scholarship examinations.

X. OTHER MATTERS

Staffing

As already noted Dr Dixit retired during the year. The Department is grateful to him for his outstanding service over a third of a century. We wish him well in his retirement and look forward to seeing him around the Department for many years to come.

The following academic staff were successful in their applications for promotion:

Dr Jianbei An	to Associate Professor
Dr Bruce Calvert	to Associate Professor
Dr Colin Fox	over Senior Lecturer bar
Dr Paul Bonnington	extra increment

Department Administration

Many staff members have made substantial contributions to the effective administration of the Department. Thanks are especially due to all the general staff, and to the following staff for taking on key responsibilities in the Department:

Deputy Head of Department	Mr David Alcorn
Departmental Committee	Mr David Alcorn, Dr Bill Barton, Prof. Marston Conder, Dr Paul Hafner, Dr Vivien Kirk, Prof. Ivan Reilly
Department Staffing Advisory Committee	Assoc. Prof. Bill Barton, Assoc. Prof. Eamonn O'Brien, Prof. Gaven Martin, Dr Maxine Pfannkuch, Prof. James Sneyd
Academic Staff Performance Reviewers	Assoc. Prof. Bill Barton, Prof. Boris Pavlov
Head of Applied Mathematics Unit	Prof. James Sneyd
Head of Mathematics Education Unit	Dr Maxine Pfannkuch
Head of Tamaki Mathematics Group	Dr Robert Chan
Director of Graduate Studies PhD	Dr Sina Geenwood and Dr Shayne Waldron
Director of Graduate Studies Masters and Postgraduate Diploma	Mr David Alcorn and Dr Rod Gover
Teaching Co-ordinator	Dr Paul Hafner
Research Co-ordinator	Prof. Marston Conder
Computing Services	Dr Paul Bonnington, Assoc. Prof. Eamonn O'Brien, Dr Philip Sharp, Dr Mike Thomas
BTech (Industrial Maths) Co-ordinator	Dr Steve Taylor
Enrolment Co-ordinator	Mr David Alcorn
Timetable Administrator	Mr David Alcorn
Examinations Co-ordinator	Mr David Alcorn
Publicity Officer	Mr Chris King
Regulations/Handbooks	Dr David Smith
EEO/EEdO Representative	Dr Bruce Calvert
NZ Mathematical Society Correspondent	Mr Garry Tee
Webmaster	Dr Shayne Waldron
Overseas Students & Ad Eundum Admissions	Mr David Alcorn
Library Liaison Officer	Mr David Alcorn
Convenor of Staff/Student Liaison Committee	Mr Greg Oates
Director Mathematics Learning Centre	Mr Greg Oates
Organiser of the Undergraduate Laboratories	Ms Nicolette Moir
Markers Co-ordinator	Mr Roy Swenson
Department Research Report Series	Mrs Olita Moala
Safety Officer	Mr Ross McCallum and Ms Daniela Rovere
Seminars:	
Algebra, Geometry & Combinatorics	Assoc. Prof. Eamonn O'Brien
Analysis	Dr Shayne Waldron
Applied, Computational & Industrial Maths	Dr Geoff Nicholls
Mathematics Education	Ms Barbara Miller-Reilly
Topology	Dr Sina Greenwood
Department Colloquia	Dr Vivien Kirk and Assoc. Prof. Eamonn O'Brien

Faculty Representatives:

Arts	Mr David Alcorn
Business and Commerce	Dr Joel Schiff
Engineering	Dr Bruce Calvert

University Committees:

Mr David Alcorn: Library Liaison Officer, Member of Science Group Library Committee, Science Faculty subprofessorial representative on Senate, Member of Arts Faculty Board of Undergraduate Studies.

Dr Paul Bonnington: Chair – Faculty of Science IT Committee (Academic), University Steering Committee on IT Procurement, University Steering Committee on ITSS Roadmap and Budget 2003, University IT Faculties Forum.

Assoc. Prof. Bill Barton: Auckland University Human Subjects Ethics Committee, Sub-professorial representative Education Committee, Chair of Faculty of Arts Research and Study Leave Subcommittee, VC University Development Fund Review Panel, Management Committee of NZ Centre for Latin American Studies, Chair Education Subcommittee on IELTS & TOEFL, Faculty of Science Chair of Foundation Studies.

Assoc. Prof. Bruce Calvert: Science Faculty EO Committee.

Dr Robert Chan: Associate coordinator for Tamaki Open Day held in August.

Prof. Marston Conder: Vice-Chancellor's representative on selection committee for Chair in Bioinformatics, Chair of University's Budget Committee, Convenor of Benchmarking Taskforce, Member of Vice-Chancellor's Advisory Committee, Chair of Architecture School Reference Group, Member of University of Auckland Foundation & Distinguished Visitors Awards Committee, Member of University's Major Equipment Fund assessment panel

Prof. David Gauld: Faculty of Science Staff Advisory Committee.

Dr Sina Greenwood: Member of the advisory committee for the Pacific Audit, Member of the steering committee to formulate a proposal to form a Pacific Institute, Member of the Tuakana network.

Dr David McIntyre: Computing Committee.

Mr Greg Oates: Member of Student Affairs Working Group looking at Student Representation.

Assoc. Prof. Eamonn O'Brien: Faculty of Science IT Committee.

Prof. Ivan Reilly: Acting Director of the University of Auckland at Manukau Programme (UAMP), Board of Studies in Education, Board of Foundation Studies, Member of the newly formed Year 13 Studies Committee.

Dr Wiremu Solomon: Faculty of Science Maori and Pasifika Committee.

New Zealand Journal of Mathematics

The New Zealand Journal of Mathematics is jointly produced by the Department and the New Zealand Mathematical Society. The Editorial staff consists of Prof. Gaven Martin (Editor), Dr Joel Schiff (Executive Editor), Dr Jianbei An (Associate Editor), Ms Lee Min Young (Editorial Assistant), and Ms Betty Fong (Production Assistant). Two issues of Volume 31 (Numbers 1 and 2) of the NZJM were published during the year. Members of Department who have served on the Editorial Board are Professors

John Butcher, Marston Conder, David Gauld, Vaughan Jones and Gaven Martin, and the Department's representatives on the Management Committee are Mr David Alcorn (who is also convenor of the Committee) and Prof. Ivan Reilly.

VIII. OVERALL COMMENTS ON WORK AND PROGRESS WITHIN THE DEPARTMENT

I am very grateful to the support given by the members of the general staff of the Department, especially at a time when the University seems unable to finance sufficiently many general staff. Early in the year the Department Manager, Ross McCallum, transferred to a similar position in the School of Geography and Environmental Sciences. I thank him for the efficient way in which he managed the Department in his three years or so in the position. Later in the year his successor, Ms Daniela Rovere, formerly of the Geology Department, took up the position. Both of these staff members have run a very successful operation. Jaya Venugopalan runs an outstandingly successful Student Resource Centre: so successfully, that Departments other than the primary three (Computer Science, Mathematics and Statistics) make use of her services. She was joined in June by Ajita Pendharkar and their contributions were recognised by a Faculty of Science General Staff Award in December. The general office staff continue to work wonders with an especially heavy load when we were without a Department Manager. Finally I mention the computer support staff who are available often at strange times of the week to rectify problems before they become severe.

I would also like to pay tribute here to Dr Stephen Taylor who for a number of years has run the Industrial Mathematics Programme at Tamaki. While he himself is not a specialist in Industrial Mathematics, Dr Taylor ran the programme very effectively and efficiently.

The Department is actively pursuing the broad aims set out in the University's mission documents, encouraging a high quality environment for teaching and learning, continuing to undertake world class research in a wide range of areas, and attracting and supporting an increasing number of postgraduate students. The Department is clearly the strongest Mathematics Department in this country by any measure, and in almost every area. Within Australasia we rank within the top few.

David Gauld
Professor and Head of the Department of Mathematics