

DEPARTMENT OF MATHEMATICS

ANNUAL REPORT 2003

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 905 in 2003 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 2003 included a number of new appointments to the permanent staff.

- Dr Hannah Bartholomew, formerly of King's College, London, arrived in April to take up her lectureship in Mathematics Education. She is particularly interested in equity issues in Mathematics Education.
- Dr Michael Meylan, formerly a senior lecturer at the Albany Campus of Massey University, took up a lectureship in Applied Mathematics in August. His research interests involve especially the effect on thin plates (such as ice on a floating run-way) of waves in the surrounding liquid.
- Dr Shixiao Wang, formerly of Advanced Engineering Technology and General Electric in New York, arrived to take up his lectureship in Industrial Mathematics in October. With a PhD in Applied Mathematics from Paris, he led the development of a quiet fan for refrigerators.

At the end of the year Dr Michael Thomas was promoted to Associate Professor.

Another New Zealand Science and Technology Post-Doctoral Fellow came to the Department. He is Dr Richard Evans, who was a student here in the 1990's and completed his doctorate in low dimensional topology at the University of Michigan. He joined the other three NZS&T Post-Doctoral Fellows, Drs Jiling Cao, Sina Greenwood and Mark Harmer.

The Department is proud of its efforts in improving the performance of students from under-represented groups over the past few years. While more details will be given in section III I do wish to highlight just one aspect of this. Late in the year members of the Mathematics Education Unit received confirmation of the value to the wider community of the Mathematics Enhancement Project. This project began its pilot phase in 1999 in a few decile 1 and 2 schools in Manukau City. Its basic aim is to improve the mathematical understanding of senior students at those schools and recognises the serious waste of good talent caused by inadequate understanding through a combination of research and development. With initial financial support from the Woolf Fisher Trust the Project has received significant financial support this year from the Manukau City, with the mayor taking a direct interest, and from the Ministry of Education.

The MATHS 102/202 team consisting of leaders Greg Oates, Moira Statham, Bill Barton and members Alan delos Santos, Willy Alangui, Ivan Reilly, Mike Thomas, YeYoon Hong, Hannah Bartholomew, Garry Nathan, Viliami Latu, Sina Greenwood, Wiremu Solomon and Glen Bryant won a Faculty of Science Teaching Excellence Award. The citation reads "This team has made a strong contribution to the EO aspirations of the Faculty through the provision of opportunities for Maori and Pacific Island students to succeed in tertiary education. The team demonstrates a strong commitment to recruiting and retaining Maori and Pacific Island students. The strong course design and specific attention to learning styles and mechanisms which enhance learning for this cohort of students is the hallmark of this mathematics course. A measure of the success of this programme in launching students into academic life is the continued success which they enjoy in Mathematics in subsequent years."

Finally in this part of the report I wish to record the Department's pride at the award of an honorary doctorate to our retired colleague Garry Tee by Auckland University of Technology for his research over half a century in mathematics and its history.

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 2003 academic year student enrolments totalled approximately 905 EFTS, including 849 undergraduate EFTS (768 on the City Campus and 81 at Tamaki) and 56 graduate EFTS. One can speculate on reasons for the drop of about 35 EFTS from what has been a fairly stable number over several years, perhaps the SARS epidemic, perhaps a downturn in the IT industry. It is pleasing to note a slight increase in our graduate enrolments over 2002.

The major efforts of 2002 in debating a new array of undergraduate courses drew to a close early this year when our proposed new structure was approved firstly by the Department and then by successive higher authorities until eventually it was approved and will be implemented in 2004. The changes involved wide discussions with our client Departments to ensure that what we are proposing is acceptable to them. As a result we have what we believe to be a robust structure which will serve both the needs of a diverse range of client Departments as well as our own needs. From 2004 the Department will have two strands in its Pure Mathematics offering: a service strand which is a relatively minor variant of the existing 108 and 208 strand; a more rigorous strand combining the old 130/230 and 151/152. One aim of the latter strand is to boost our graduate numbers.

From the middle of 2003 two teams of staff members have been working hard to develop quality teaching materials for the new courses. Unfortunately the external help we sought in this development seems not to have benefited us much but we still expect to complete the work in time for Semester 1 2004.

The revision of our course structure has also involved our Stage III courses in both Pure and Applied Mathematics. The Department offered some 1 point courses but as the number of them offered by other Departments diminished so did the enrolment in ours and their viability has gone. As well as combining, or just retiring, 1 point courses we have taken the opportunity to review the content considerably. We now have a better and clearer route for prospective graduate students to follow whether they wish to concentrate on Pure Mathematics or on Applied Mathematics.

As another part of its Waitangi initiatives, hence discussed in more detail in section IV, the Department offered a stream of MATHS 101 by video link-up. The students taking this stream are teachers in kura kaupapa across New Zealand. While it was a challenge for the lecturer and others involved in MATHS 101 we believe that there will be a pay-off through the improvement of the mathematical skills of those teachers which will then feed through to a better mathematical education for their students.

The Department continues to offer three courses during the Summer Session. MATHS 208 has grown almost to reach the capacity of the largest lecture theatre; we are reluctant to open a second stream of this course. MATHS 108 is also growing but at a slower rate. We have capped the enrolment on the third, MATHS 102 to fit with the teaching methods used but are considering removing this cap in 2004.

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. This year we were able to exploit the availability of a large block of vacant space which housed part of the Department of Computer Science before the Building 303 Extension was completed. As a result we were able to run tutorials in our own specialised way without requiring the students to hunt all over the University for their tutorial rooms. Following the takeover of most of that space by another Department we will require alternative, properly designed, tutorial rooms to allow us to continue to offer the tutorials needed by our students.

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 Mr Greg Oates in conjunction with the Centre for Professional Development and guidebooks produced by the Department.

The new computer laboratories, operated by the Department of Computer Science but for all three Departments (the third being Statistics) are working well. In some ways we have to adjust our operations to fit in with the new arrangements but that is working.

II. OTHER STUDENT MATTERS

Scholarships and Prizes

Senior Scholarship in Applied Mathematics	Tiangang Cui
Senior Scholarship in Mathematics	Timothy Sutherland
Senior Scholarship in Industrial Mathematics	Iain Murphy
Annual Prize in Applied Mathematics	Erin Higgins, Amy Peng
Annual Prize in Pure Mathematics	Matthew Auger
Collins Prize in Mathematics	Erin Higgins, Amy Peng
Margaret Morton Prize	Shan-I Lee
Mathematics Education Prize	Lisa Darragh
Mathematics Education Technology Prize	Garry Nathan

Summer Scholarships

Eleven students were engaged in research projects over the summer 2002-3, with scholarship support from the Department, staff research grants, 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. 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

The Department continues to award its Aldis Scholarships to enable top Maori and Pasifika students who have just completed high school to enrol in a Summer Session course. In the past these students have enrolled in MATHS 102, where they have almost without exception scored very high grades despite their school grades being low in comparison with students from higher decile schools. This year for the first time two of the students enrolled in the higher level MATHS 108 where their performance was also exemplary.

Student/Staff Liaison Committee

Mr Greg Oates continues to convene ably the Student/Staff Liaison Committee, with four meetings during the year. This is now the only Department in the University which has won a WAVE award for the best run Student/Staff Liaison Committees every semester since the award was initiated in 2002.

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 as well as the letter 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. Ideally we would offer a similar arrangement for students coming from backgrounds in other languages but it is difficult to arrange suitable tutors and to be able to fund such tutorials, especially for the small number of students involved. A member of the Department has undertaken a series of three research studies on this issue, the last funded by the Ministry of Education.

Since the death on 2000 of Dr Margaret Morton the Department has had only two female members of its permanent academic staff, and one of those is shared 50% with the Department of Statistics. Early in the year we were pleased to welcome a third female to the permanent staff, Dr Hannah Bartholomew. Right at the end of the year an offer of a permanent position to a fourth female, Dr Sina Greenwood, was accepted by her: she will take up her position early in 2004 when she completes her Post-Doctoral Fellowship.

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. Some of our new courses being introduced in 2004 are specifically aimed at 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. We are probably at the forefront in the Faculty with respect to initiatives. Some of our activities are done in close cooperation with the Department of Statistics.

Supported by the Faculty of Science's Equal Opportunity Initiatives and the Department's own resources the Department consolidated what it had already developed and took new steps.

- Mr Garry Nathan from Auckland College of Education continues as a senior tutor jointly with Statistics with responsibility for Maori students.
- Mr Viliami Latu of Tongan origins and formerly of Mt Roskill Grammar School continues as a senior tutor jointly with Statistics with responsibility for Pasifika students.
- Drs Sina Greenwood and Wiremu Solomon continued to oversee the Maori and Pasifika initiatives.
- The Aldis scholarships programme continues to work well. This year we made awards to 21 students of Maori and Pasifika origins from low decile schools in South and West Auckland. For the first time two of those students enrolled in the more advanced MATHS108 during the Summer Session and one of those achieved an A+ grade while the other scored an A grade. The remaining 19 enrolled in MATHS102 during the Summer Session where 5 achieved A or A+ grades while 11 of the remaining 14 passed. As in the past, few, if any, of these students would have studied at the University of Auckland had they not been awarded these modest scholarships. Eight of the 21 students failed the Bursary examination and all eight enrolled in either the Tertiary Foundation Certificate or the MAPAS Programme. While the Department is grateful to the Faculty of Science Equal Opportunities Committee for continuing to support the Aldis Scholarship scheme by way of a financial grant we feel that the scheme has proven itself over a long enough time frame for the cost of the scholarships to be included in the Department's annual budget.
- Aldis scholars from previous years are now acting as mentors both for newly arrived Aldis scholars and for other Maori and Pasifika students. Some of our early Aldis scholars are now nearing completion of their degrees; one has been awarded a senior prize having almost completed her degree in two years. Another was awarded a Summer Scholarship in this Department.
- 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.
- The Mathematics Enhancement Programme has been referred to in the preamble. Run by Associate Professor Bill Barton and other members of the Mathematics Education Unit its value to the community has been recognised by significant grants from Manukau City and the Ministry of Education during 2003.

V. RESEARCH

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. Four 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:

- Professor Marston Conder and Dr Arkadii Slinko refuted a conjecture on comparative probability orderings on finite sets.
- Professor John Butcher's major book "Numerical Methods for Ordinary Differential Equations" was published by Wiley.

One measure of the Department's international research ranking is its hosting of international conferences and workshops. Many members of the Department took significant roles in the organisation of the Remarkable Delta'03 (DELTA) Conference an international conference on undergraduate education in Mathematics held in Queenstown with almost 1000 participants.

In part because of funding from the New Zealand Institute of Mathematics and Its Applications, the Department hosted a number of small to medium workshops involving researchers from the Department, from the rest of New Zealand, and from overseas. These workshops often have the extra spinoff effect of having overseas visitors remain on in the Department to complete research projects with members of the Department. At times our office resources are heavily stretched with every available desk occupied.

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 workshops but many more came at other times. The list below includes 55 such visitors.

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

PUBLICATIONS

(A) Books – authored research

BUTCHER, J. C., *Numerical Methods for Ordinary Differential Equations*, J. Wiley, Chichester, 439 p., 2003.

(B) Book Chapters

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(C) Journal articles – refereed articles in scholarly journals

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(E) Conference publications – full written papers, refereed

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ALANGUI, W. 'Searching for Mathematical Ideas in Stone Walls'. L. Bragg, C. Campbell, G. Herbert, & J. Mousley (eds.), *Mathematics Education Research: Innovation, Networking, Opportunity. Proceedings of MERGA 26. Geelong: Maths Education Research Group Australasia*, Geelong, 7-11 July, 2003, 57-64.

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491: On monotonically orthocompact spaces , by Jiang Shouli and Xu Yuming

492: Obstructions to directed embeddings of Eulerian digraphs in the plane , by C. Paul Bonnington, Nora Hartsfield and Jozef Siran

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494: Countable compactness of hyperspaces and Ginsburg's questions , by Jiling Cao, Tsugunori Nogura and A. H. Tomita

495: Volterra Spaces are re-visited , by Jiling Cao and David Gauld

496: Normal subgroups of low index in the modular group and other Hecke groups , by Marston Conder and Peter Dobcsanyi

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- 502: Comparisons of integrators on a diverse collection of restricted three-body test problems , by P.W. Sharp
- 503: Analysis of the Dispersion Equation for the Schr"odinger Operator on Periodic Metric Graphs , by V.L. Oleinik, B.S. Pavlov, and N.V. Sibirev
- 504: Rosenbrock-type 'Peer' two-step methods , by H. Podhaisky, R. Weiner, B.A. Schmitt
- 505: Analytic perturbation techniques for the Friedrichs model : Intermediate Operator , by B. Pavlov and I. Antoniou
- 506: N-body simulations: the performance of eleven integrators , by P.W. Sharp
- 507: On the average minimum size of a manipulating coalition , by Geoffrey Pritchard, Arkadiii Slinko

(H) Refereed designs

(I) Patents

PAVLOV, B.: 'Quantum Domain relay', United States Patent application 10/276, 952, Patent Application Publication US 2003/0156781 A1, Aug. 21, 2003.

(J) Major original creative works

(K) Videotapes and films

(L) Other Works

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OTHER MATTERS RELATED TO RESEARCH ACTIVITIES

Diploma, Honours and Masters Students

Name	Thesis/Dissertation/Project Topic/Title	Supervisor(s)
Priscilla Tse	Lie Group Methods in Geometric Integration	Prof. J.C. Butcher
Jane Lee	Numerical Methods for Ordinary Differential Equations	Prof. J.C. Butcher
Rogani Naidoo	Collaborative Learning (4pt project)	Dr Maxine Pfannkuch
Megan Jowsey	Making sense of data (2pt project)	Dr Maxine Pfannkuch
Malcolm Walsh	Cellular Automata Project	Dr J.L. Schiff
Peter Lane	Cellular Automata Summer Project	Dr J.L. Schiff
Mala Nataraj	Vedic Mathematics and Algebra Learning	Dr Mike Thomas
Sepideh Stewart	CAS calculators and the Learning of Linear Algebra	Dr Mike Thomas
Billy Hau Ming (Stats)	Existence, Uniqueness and Monotonicity of the User-Optimal Policy for a Simple Markovian Transport Network	Dr Wiremu Solomon

Tony Simmiss	Numerical Method for SDEs	Dr Wiremu Solomon
Malcolm Walsh	Topological groups and topological games	Dr Warren B. Moors
Malcolm Walsh	Project: Potential Theory in the complex plane	Assoc. Prof. Norman Levenberg
David Grant	Conformal differential geometry	Dr Rod Gover
Ying-Hsuan Chen	Then Hall numbers and Hall graph of $Sp_4(q)$	Assoc. Prof. Jianbei An
Amy Peng	Conformal mapping	Prof. Boris Pavlov
Kate Lee	Uniqueness theorem for Gevrey classes	Prof. Boris Pavlov / Dr Mark Harmer
Kieran Robert	Optical Switch	Prof. Boris Pavlov
David Simpson	Complex oscillations and waves of calcium in pancreatic acinar cells	Prof. James Sneyd / Dr Vivien Kirk
John McCabe-Dansted	Exploratory Data analysis of Common Social Choice functions	Dr Arkadii Slinko

PhD Students

The following students completed their PhD degrees during the year.

Name	Thesis Topic/Title	Supervisor(s)
Sanka Liyanage	Informal assessment of secondary school mathematics teachers	Dr Mike Thomas and Dr Kay Irwin
William Wright	Numerical solution of differential equations	Prof John Butcher & Dr Robert Chan

Current PhD students.

Name	Thesis Topic/Title	Supervisor(s)
Shehenaz Adam	Ethnomathematics in the Maldives Curriculum	Assoc Prof Bill Barton & Dr Maxine Pfannkuch
Willy Alangu	Mathematics and Culture	Assoc Prof Bill Barton
Renu Choudhary	Functional Analysis	Assoc Prof Bruce Calvert
Nicoleen Cloete	Probability theory and Stochastic Processes with application in population genetics and phylogenetic (Biological Sciences) inference	Dr Geoff Nicholls & Assoc Prof David Scott
Alan De Los Santos	Graphics Calculators in Mathematics Learning	Dr Mike Thomas
David Godfrey	Learning Algebra: The Arithmetic-Algebra Interface	Dr Mike Thomas & Dr Kay Irwin (Education)
Jianhua (Jeff) Gong	Geometry & Analysis	Prof Gaven Martin & Assoc Prof Norm Levenberg
Gareth Hegarty	Control theory and partial differential equations	Dr Stephen Taylor
Shirley Huang	Numerical Methods for ODEs	Prof John Butcher & Dr Robert Chan
Edward Huang	Representations of Finite Groups	Assoc Prof Jianbei An & Assoc Prof Eamonn O'Brien
Barbara Kensington Miller	Professional Development of mathematics teachers in low decile 2 degree schools	Assoc Prof Bill Barton & Prof Stuart McNaughton
Sione Na'a-Pangai Ma'u	Pluripotential Theory	Assoc Prof Norm Levenberg
Barbara Miller-Reilly	Affective change in adult students returning to the study of mathematics	Dr Kay Irwin (Education) & Dr Constance Brown
Nicolette Moir	Numerical Analysis	Prof John Butcher & Dr Robert Chan
Greg Oates	Technology and the Mathematics Curriculum	Dr Mike Thomas & Assoc Prof Bill Barton
Judith Paterson	Participation in professional development & its influence on pedagogical change for mathematics teachers	Assoc Prof Bill Barton
Debasish Roy	Markov chain Monte Carlo algorithms, Bayesian Inference, Inverse problems	Dr Geoff Nicholls & Dr Colin Fox
Sasha Rubin	Topics in Computational Algebra	Assoc Prof Eamonn O'Brien &

		Prof Marston Conder & Assoc Prof Bakhadyr Khoussainov (Computer Science)
Joseph Silhan	Differential geometry	Dr Rod Gover & Dr Anthony Blaom
Jamie Sneddon	Planar Infinite Graphs	Dr Paul Bonnington & Prof Marston Conder
Angela Tsai	Applied Maths – Numerical Analysis	Dr Robert Chan & Prof John Butcher
Chung-Ju (Jeff) Tsai	Complex Analysis & Geometry	Prof Gaven Martin & Assoc Prof Norm Levenberg
Krasimira Tsaneva-Atanasova	Mathematical Biology	Prof James Sneyd
Brian Van Dam	Topological Resolution Spaces	Prof David Gauld
Mirko Wojnowski	Mathematical models of human vocabulary change	Dr Geoff Nicholls & Assoc Prof Russell Grey
Kaimin Zhang	The Representation of Finite Groups	Assoc Prof Jianbei An & Assoc Prof Eamonn O'Brien

Research Visitors

Name	Affiliation
A/ Prof Majid M Ali	Sultan Qaboos Univ, Oman
Prof Jon Alperin	University of Chicago
Prof Len Bos	University of Calgary
Prof Thomas Branson	University of Iowa
Dr Hermann Brunner	Memorial U of Newfoundland, Canada
Ms Glen Bryant	Green Bay High School
Prof Chris Budd	University of Bath, UK
Dr Mari-Paz Calvo	Univ. of Valladolid, Spain
A/Prof Andreas Cap	University of Vienna
Prof. Alan Champneys	University of Bristol
Prof Myung Hyun Cho	Wonkwang University
Dr Javier Cirre	UNED, Madrid (Spain)
Dr John Crisp	Université de Bourgogne (Dijon, France)
Prof. S Dolecki	Université de Bourgogne (Dijon, France)
Prof Harry Dym	Weizman Institute
Prof. Johann Engelbrecht	University of Pretoria, South Africa
Prof Paul Fong	University of Illinois at Chicago
Peter Fox	Texas Instruments, Australia
Prof Paul Gartside	The University of Pittsburgh
Prof Simon Gindikin	Rutgers University
Prof Tim Goodman	University of Dundee
Assoc. Prof. George Havas	University of Queensland
Prof Kengo Hirachi	University of Tokyo
Prof Jari Kaipio	Applied Physics, Kuopio University
Dr Ville Kohlainen	University of Kuopio, Finland.
A/Prof Nathan Kutz	University of Washington
Prof. Colette Laborde	University of Grenoble
Prof Jean-Marie Laborde	Grenoble University

Prof Richard Laugesen	University of Illinois Urbana-Champaign
Prof Finnur Larusson	University of Western Ontario
Dr Pierre Leone	University of Geneva
Prof Richard (Dick) Lesh	Purdue University, USA
Dr Francois Loret	ENSTA, Paris
Roswitha Maez	Humboldt Univ. of Berlin, Germany
Dr Abdul Mohamad	Sultan Qaboos Univ, Oman
Prof. F Mynard	University of Mississippi
Prof Mike Newman	Australian National University, Canberra
Portia Neydorff	Texas Instruments, Australia
Dr Pawel Nurowski	Warsaw University
Prof Jorn Olsson	University of Copenhagen
Dr V Olienik	St Petersburg State University
Dr Larry Peterson	University of North Dakota
Dr Helmut Podhaisky	Martin-Luther-Universität Halle-Wittenberg
Dr Primoz Potocnik	University of Ljubljana
Dr Melissa Rodd	University of Leeds
Laurette Rogers	Californian Environmental Science Education
Dr Alastair Rucklidge	University of Leeds
John Rugis	Manukau Institute of Technology
Dr Jan Saxl	University of Cambridge
Prof. Harvey Schmidt	Lewis & Clark College, Portland, Oregon
Prof. David Smith	Duke University, North Carolina
Prof Michael Vaughan-Lee	University of Oxford
Prof Peter Webb	University of Minnesota
Prof Rob Wilson	University of Birmingham
Prof. Geoff Whittle	Victoria University of Wellington

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

Prof David Brillinger (Department of Statistics, U California, Berkeley): Some experiences with random effect (generalized) linear models

Dr Stuart Scott (University of Auckland): The Z-constrained Conjecture

Miss Lara Jamieson (Statistical Laboratory and Department of Plant Sciences, University of Cambridge): Bayesian Modelling of spatial and temporal spread of an epidemic.

Prof Frederic Mynard (University of Mississippi): Sequentiality and Fréchetness of finite products of topological spaces

Prof Stephen Watson (York University): Selection Theorems through the Notion of Coherence

Dr John Crisp (Université de Bourgogne, Dijon, France): Automorphism groups of Artin groups

Professor Moshe Y. Vardi (Rice University): Logic Begat Computer Science When Giants Roamed the Earth

Prof David A Smith (Duke University): Reusable tools for creating interactive online learning environments

Prof Vadim Kuznetsov (University of Leeds): Jack polynomials integral equation, representation and factorisation

Dr John Crisp (Université de Bourgogne, Dijon, France): Notions of curvature for 2-dimensional groups

Dr Melissa Rodd (University of Leeds): Ways ahead successful mathematics students at two universities

Professor Szymon Dolecki (Université de Bourgogne, France): Convergence theory convenient abstraction level

James Russell (University of Auckland): A recent survey of small mammal trapping methods

Dr Jan Saxl (University of Cambridge, U.K.): On distance transitive graphs and multiplicity free representations

Dr Wiremu Solomon (University of Auckland): Teaching Maths 101 via Multi-Videoconferencing to Kura Kaupapa Maths Teachers

Cathy P Vistro-Yu (Ateneo de Manila University): Mathematical Literacy of Filipino Students

Dr Sina Greenwood (University of Auckland): Brunnian braids

Dr Paul Hafner (University of Auckland): The Universe in the Higman-Sims graph

Dr Joel Schiff (University of Auckland): The World of Cellular Automata

Prof Kevin McLeod (University of Wisconsin-Milwaukee): An Overview of the Geometrisation Conjecture for 3-Manifolds.

Prof. Richard S. Laugesen (University of Illinois Urbana-Champaign): Wavelet type spanning sets for L^p and Sobolev space

Professor Tony Brown (Waikato University): The language of mathematics teaching

Prof David Gauld (University of Auckland): Some manifold problems I would like to be able to answer.

Dr Heidi Larsson (North Atlantic Neuro-Epidemiology Alliances, University of Aarhus, Denmark): Perinatal factors, Parental Psychiatric History, Socioeconomic Status and Autism in Denmark- A Register-Based Case-Control Study.

Jamie Sneddon (University of Auckland): Obstructions to clustered planarity

Dr Tatiana Evans (The University of Auckland): High distance Heegaard splittings of 3-manifolds.

Professor George Havas (University of Queensland): On proofs in finitely-presented groups

Dr Richard Evans: Thurston's ending lamination conjecture for hyperbolic 3-manifolds

Greg Ewing (SBS Auckland): Inferring migration rates from DNA sequence data using reversible-jump MCMC

Nicholas T. Longford, (De Montfort University, Leicester, England): Examples of multiple imputation

Moshe Haviv (Hebrew University of Jerusalem): Queues with relative priorities

Prof John S. Gray (University of Oslo, Norway): The estimation of species richness a new method and its application to marine data from Norway and Hong Kong.

Professor Caroline Series (University of Warwick): Indra's Pearls

Dr Jiling Cao (The University of Auckland): Topological properties defined by stars

Dr Javier Cirre (UNED, Madrid, Spain): Symmetry types of cyclic covers of the sphere branched over three points

Dr. James M. Curran (Statistics Department, Waikato University): Modelling the distribution of recovered glass

Dr Tony Blakely (Dept. of Public Health, University of Otago): Death and Statistics - Using data matching techniques to correct biases in New Zealand mortality data.

Dr Peter Grootenboer (Waikato University): The affective development of preservice primary teachers in mathematics.

Dr Abdul Mohamad (Sultan Qaboos University): Spaces with diagonal properties

Assoc Prof Peter Wills (Physics, Auckland): Self-organised criticality in genetic systems

Dr David McIntyre (The University of Auckland): Finite intervals in partial orders of topologies

Dr Arden Miller (Department of Statistics, University of Auckland): A Geometric Interpretation of the Analysis of Unreplicated Factorial

Prof. Finnur Larusson (Univ. of Western Ontario): Complex geometry and abstract homotopy theory

Professor Richard Lesh (Department of Mathematics, Purdue University): What mathematics preparation is needed by heavy users of mathematics?

Dr Paul Gartside (The University of Pittsburgh): Get rich quick the Banach-Tarski way.

Caroline Yoon (Purdue University): A Models and Modeling perspective on Mathematical Creativity

Dr. Carlo Laing (IIMS, Massey University at Albany): Pattern formation in neural systems

Assoc Prof Bakhadyr Khossainov (Dept of Computer Science, University of Auckland): Games, Automata, and Complexity

Prof Paul Gartside (The University of Pittsburgh): Free subgroups of Polish groups

Dr Marie Hofmannova (Charles University, Prague): Attitudes of Mathematics and Language Teachers Towards New Educational Trends

Professor Boris Pavlov (Department of Mathematics, University of Auckland): Techniques of intermediate operators in perturbation theory

Dr Tsukasa Yashiro (The University of Auckland): Surfaces in 4-space

Professor Matthias Langer (Vienna University of Technology): Resonances and spectral concentrations of a Sturm-Liouville problem depending rationally on the eigenvalue parameter

Professor Malcolm Brown (Cardiff University): Some inverse spectral problems for the Sturm--Liouville equation

Professor Malcolm Brown (Cardiff University): Some Inverse Problems

Prof Simon Gindikin (Rutgers University): Complex crowns of Riemann symmetric spaces

Prof Andreas Cap (University of Vienna): Geometry of 2nd order ODE's and parabolic geometries

Prof. Nathan Kutz (Department of Applied Mathematics, University of Washington): Local and nonlocal mean-field theory in N-body quantum mechanics applications to Bose-Einstein condensates in standing light waves

Professor Tim Pedley (DAMTP, Cambridge University): Modelling pattern formation in suspensions of swimming micro-organisms

Professor Simon Gindikin (Rutgers University): Manifolds of rational curves, twistors, solitons

Professor Lawrence J. Peterson (University of North Dakota): A Mathematica based approach to conformal geometry

Professor Peter Webb (University of Minnesota): Computing resolutions for group cohomology

Prof. David Schaeffer (Department of Mathematics, Duke University): A well-posed BVP for a hyperbolic equation with Dirichlet boundary conditions

Prof. John Butcher (Department of Mathematics, University of Auckland): Stability and accuracy of numerical methods for initial value problems

Professor David Boyce (University of Illinois at Chicago): Applied Probability Seminar Congestion Management by Road Pricing Implications for Urban Travel Forecasting Models

Dr. Gerald H. L. Cheang (Nanyang Technological University, Singapore): A Simple Approach to Pricing Options with Jumps

Prof John V. Matthews, III (Department of Mathematics, Duke University): Secondary circulation of granular flow through non-axisymmetric hoppers

Sasha Rubin (University of Auckland): Automatic linear orders

Dr Nicholas Dudley Ward (University of Auckland): What I got up to in the City of London

Sasha Rubin (University of Auckland): Automatic algebraic structures

Dr Andrei Korobeinikov (Centre for Mathematical Biology, Mathematical Institute,): Long-term coexistence of two competing spatially distributed species.

Dr Gerald Cheang (Nanyang Technological University, Singapore): An Introduction to Exotic Options

Dr. Chris Messom (IIMS, Massey University at Albany): Trends in Supercomputer technology

Dr Warren B. Moors (The University of Auckland): A characterisation of the Namioka Property

Dr. John Enlow (Department of Mathematics & Statistics, University of Otago): Modelling surfactant liquid crystal structures

Prof Myung Hyun Cho (Wonkwang University): Topological Operations of Iterated Star-covering Properties and Star-covering Properties of Σ -Products

Sivajah Somasundaram (University of Waikato): Recent results on weak Asplund spaces

Professor Pip Forer (School of Geography & Environmental Science): Subtleties of Space Gaps in the Armoury of Geographic

Dr. Philip W. Sharp (Department of Mathematics, University of Auckland): Close approaches in N-body simulations of the Solar System

Professor James Sneyd (Auckland): Neither an ant nor a spider be historical vignettes in mathematical physiology

Derek Law (Department of Statistics): Recent Developments of Data Visualization Tools

Dr Sina Greenwood (University of Auckland): Brunnian rings

Dr. Scott Parkins (Department of Physics, University of Auckland): Quantum Chaos with Ultra-Cold Atoms

Dr Mike Meylan (Massey University): Application of Spectral Theory to Linear Water Waves.

Professor Alexander Dimitrov (Montana State University): Analysis and modeling of sensory systems through Information Distortion

Professor Andy Philpott (Department of Engineering Science and Yacht Research Unit): Optimization, Probability, and the America's Cup

Prof Keith J. Worsley (Dept. of Mathematics & Statistics, McGill University): Heritability random fields

Professor Steven R. Bishop (University College London): Nonlinear Dynamics and its Applications

Dr Holly Gaff (University of Tennessee - Knoxville): A Tick-Borne Disease Model - Spread and Control of Ehrlichiosis

Dr. Alastair Rucklidge (Dept. Applied Math., University of Leeds): Infinities of stable periodic orbits in systems of coupled oscillators

Dr Robert G. Easterling (Department of Statistics, University of Auckland): Statistical Foundations for the Validation of Computer Models

Dr Tsukasa Yashiro (University of Auckland): Triple point numbers of surface-knots.

Professor Trevor Hastie (Stanford University): Independent Component Analysis by Product Density Estimation

Dr. Jiling Cao (The University of Auckland): Volterra spaces revisited

Dr. Yoshihiko Maesono (Kyushu University): Asymptotic Distributions of U-statistics

Prof Pawel Nuroski (Instytut Fizyki Teoretycznej Uniwersytet Warszawski): An analogy between second order ODEs and 3-dimensional Cauchy-Riemann structures

Dr. Stephen Coleman (Dept. Civil and Environmental Engineering, Uni. of Auckland): Waves in Submerged Particulate Beds

Professor William Duke (University of California, Los Angeles): Reciprocity laws, elliptic curves, and the Riemann Hypothesis

Assoc Prof Bill Barton (The University of Auckland): “Loose Talk: Some Thoughts and questions about how we talk mathematics”

Dr David McIntyre (University of Auckland): Characterising continuous functions on compact spaces

Prof. Shamil Galiev (Dept. of Mechanical Engineering, Uni. of Auckland): The theory of nonlinear trans-resonant wave phenomena and an examination of Charles Darwin's earthquake reports

Dr Primoz Potocnik (University of Ljubljana): Regular Covers of Graphs and Their Symmetries

Brian van Dam (University of Auckland): Prufer-type Manifolds as illustrated by Resolutions

Brian van Dam (University of Auckland): A Non-Metrisable Manifold from Resolutions

Prof Kavita Ramanan (Carnegie Mellon University): Analysis of an optimal scheduling discipline for telecommunication networks

Prof John M. Chambers (Lucent Bell Laboratories): Who will use statistics? Making statistical software available.

Professor Gordon Mason (University of New Brunswick): Narrings of group endomorphisms

Prof David Evans (Mathematics, Bristol): Beaches, barriers and balls from Stokes through Stoker to the present day

Prof Jon Alperin (University of Chicago): The stable equivalence problem

Dr Bryan F.J. Manly (Western EcoSystems Technology): Tests of Bioequivalence with Non-normal Distributions and Unequal Variances

Prof Harry Dym (Weizmann Institute): Reproducing kernels and inverse problems

Prof Kengo Hirachi (University of Tokyo): Q-curvature in conformal and CR geometries

Professor Jorn B. Olsson (University of Copenhagen): Generalized blocks and symmetric groups

Prof S.Rauch-Wojciechowski (Linköping University, SWEDEN): From Jacobi problem of separation of variables to theory of quasi-potential Newton systems

Research Grants

MARSDEN FUND GRANTS

Prof. Marston Conder, Assoc. Prof. Jianbei An, Assoc. Prof. Eamonn O'Brien	Effective computational approaches to questions in group theory and applications (\$54,000.00)
Prof. Ivan Reilly, Assoc. Prof. Bill Barton	Language dependence of mathematical concepts (\$230,000)
Dr D Brunton, Dr R Ross, Dr Geoff Nicholls, Assoc Prof R Gray, Prof A Rodrigo	Singing in the Trees: Genealogical models of culturally-inherited traits and the population memetics of bird song (\$200,000)
Dr M.H Meylan Professor V Squire Professor DV Evans Dr R Porter Professor S Sakai	Advances in ocean wave/sea-ice interaction: towards an operational model (\$240,000)
Prof. Vaughan Jones, Prof. Marston Conder, Prof. Rod Downey (VUW), Prof. David Gauld, Prof. Gaven Martin	Interactions between branches of mathematics, with applications to biology, statistics and physics (\$87,000)
Prof. J.C. Butcher , Dr A Heard	Efficient General Linear Algorithms for Ordinary Differential Equations (\$100,000)

Professor Z Jackiewicz Dr H Podhaisky Professor G Söderlind Dr W Wright	
Assoc Prof Jozef Sirán, Dr Paul Bonnington, Prof. Marston Conder	Algebraic and Structural Graph Theory (\$110,000)
Dr Rod Gover	Invariants in Analysis and Geometry (\$100,000)

OTHER EXTERNAL GRANTS

Assoc. Prof. Bill Barton , Pip Neville-Barton	Language & Mathematics, Ministry of Education (\$29,000)
Assoc. Prof. Bill Barton, Dr Hannah Bartholomew	Mathematics Enhancement Project: Professional Development Research, Teaching and Learning research Initiative (\$178,800)
Dr Paul Bonnington, Prof Geoff Whittle	Combinations and Its Applications, NZIMA(CoRE) (\$325,000)
Prof. Marston Conder Prof. Vaughan Jones, et al	Establishment of NZIMA, Centres of Research Excellence Fund (CoRE Fund) (\$1,490,000)
Prof. Marston Conder	Geometric group theory, ISAT Linkages Fund (MoRST/RSNZ) (\$5,000)
Prof S Doleki, Prof D Gauld et al	Ambassade de France en Nouvelle-Zelande Service Culturel, Scientifique et de Cooperation (\$10,000)
Dr Rod Gover, Dr Branson, Dr Eastwood, Dr Wang	Conformal Structure in Geometry, Analysis and Physics, National Science Foundation and the American Institute of Mathematics (\$20,000 US)
Dr Mark Harmer	Resonance Scattering on Manifolds and Graphs, Foundation for Research Science and Technology (\$176,100)
Dr V. Kirk Dr M. McGuinness Prof. R. McLauchlan Dr R. Murray Dr R. Quispel	Dynamical Systems and Numerical Analysis, NZIMA (\$325,000)
Assoc. Prof. Norman Levenberg	Syracuse Univ. NSF (USA), Univ. of Toronto NSERC (Canada), KTH (Sweden) SNSRC (Sweden), Jagellonian Univ. (Poland) KBN (Poland): Local costs
Dr V. Kirk	Heteroclinic Cycles, NZIMA (\$2,100)
Dr Geoff Nicholls	Perfect Simulation, AMSI (Australian) (\$1000) Abyssal flow in the Brazil Basin, NSF (American) (\$34,000) Model comparison for radiocarbon calibration data, Rafter Radiocarbon Lab (NZ) (\$300)
Assoc.Prof. Eamonn O'Brien, Prof. Gaven Martin	Geometry: Interactions with algebra and analysis, NZIMA (\$325,000)
R. Naidoo	Mathematics in the workplace (For Teacher Fellow) (\$70,143)
Assoc.Prof. Eamonn O'Brien	Collaboration visit by Professor Bettina Eick, Humboldt Foundation, Bonn (\$3,000)
Prof. Boris Pavlov	(2months stay in Japan), JSPS
Dr A, Rucklidge (for V. Kirk)	Heteroclinic Cycles, London Mathematical Society (£500)
Dr Arkadiii Slinko	Small grant for inviting Prof Herve Moulin, NZIMA (\$5000)
Dr Mike Thomas	CAS calculators in schools, Texas Instruments (\$54,300)

AUCKLAND UNIVERSITY STAFF RESEARCH GRANTS

Dr Paul Bonnington	International Strategic Opportunities fund grant. (To visit the Yokohama National University, Japan) (\$1,469)
Dr Vivien Kirk	Heteroclinic phenomena in systems with symmetry (\$4,000)

Assoc Prof Norman Levenberg	Pluripotential theory (\$5041)
Dr Maxine Pfannkuch	Developing statistical thinking in a school and in a Stage One statistics course (\$9238)
Prof Ivan Reilly	French connection (\$4,550)
Prof Ivan Reilly Mr Stuart Laird Ms Wendy Stratton	Joint Mathematics and Engineering Science Year 13 Course Vice-Chancellor's University Development Fund (\$19,500)
Mr Alan delos Santos	Derivative concepts (\$2800)
Dr Philip Sharp	DIVA: a simulation package (\$2,700)
Dr Arkadii Slinko	Grant in aid for sabbatical leave (\$9,000)
	Exploratory data analysis of major social choice functions (\$2,100)
	Algorithmic simplicity as normative requirement in mechanism design (\$2,500)
Dr David Smith	Research on greatest common divisor rings and multiplication modules (\$1,800)
Dr Stephen Taylor	Boundary Control and Modelling of an Open Vat Wine Fermenter (\$5,000)
Dr Mike Thomas Dr Ye Yoon Hong Mr Greg Oates Mr Alan delos Santos	Technology in the construction of a conceptual mathematics curriculum (\$7159.00)
Dr Mike Thomas	CAS calculators in schools (\$21,000)
Prof David Gauld Dr Jiling Cao	Proposed visitor: Prof AV Arhangelskii (\$4000)
Prof David Gauld	Convergence and metrisability of manifolds (\$3250)

AUCKLAND UNIVERSITY GRADUATE RESEARCH GRANTS

W Alangui/ Assoc Prof Bill Barton	Rice terracing practice in Philippine indigenous communities: An ethnomathematical investigation (\$2750)
D Roy/ Dr Geoff Nicholls	Simulation-based methods in Bayesian inference for physical inverse problems (\$3000)
S Adam/ Assoc Prof Bill Barton	Ethnomathematics in the Maldivian curriculum: An inquiry (\$2750)
Mr Alan delos Santos / Dr Mike Thomas	The influence of graphic calculator on conceptual understanding in calculus (\$2800)

STAFF LEAVE AND CONFERENCES

Name	Attended
Dr Hannah Bartholomew	British Society for Research in the Learning of Mathematics MERGA Remarkable Delta'03, the Fourth Southern Hemisphere Symposium on undergraduate mathematics and statistics teaching and learning. Queenstown, (November 2003)
Assoc Prof Bill Barton	Remarkable Delta'03, the Fourth Southern Hemisphere Symposium on undergraduate mathematics and statistics teaching and learning. Queenstown, (November 2003) Teacher Workshop on Ethnomathematical Curricula: Umaduddin School, Male, the Maldives (January 2003) Teacher Workshop on Ethnomathematical Curricula: Mahibadoo, the Maldives (February 2003) 3 rd European Conference on Research in Mathematics Education (CERME-3), Bellaria, Italy (February 2003) PhD Student Workshop on Ethnomathematics: School of Educational

	<p>Science, University of Granada (April 2003)</p> <p>Pre-service Teacher Workshop on “Mathematics and Language”, Charles University, Prague (April 2003)</p> <p>Teacher Education, Malmo Mathematics Education Conference (May 2003)</p> <p>V IberoAmerican Conference on General Topology and its Applications, Lorca, Spain (June 2003)</p> <p>Midsummer World Mathematics Education conference, Goteborg, Sweden, (June 2003) Saami Conference on Ethnomathematics, Jukkasjärvi, Sweden, (June 2003)M</p> <p>MERGA, Melbourne, Australia, (July 2003)</p>
Dr Paul Bonnington	<p>New Plymouth NZMRI Summer Workshop, (5-11 January 2003)</p> <p>Invited Speaker: Devonport Topology Festival (21 February 2003)</p> <p>5th International Slovenian Graph Theory Conference, Bled, Slovenia (22-27 June 2003)</p>
Prof John Butcher	<p>SciCADE 2003, Trondheim, Norway (30 June-4 July 2003): “Some new methods for stiff problems”</p> <p>ANODE 2003, Auckland (14-18 July 2003): “Life after trees”</p> <p>Advances and Challenges in Time-Integration of PDEs, Providence RI, USA (18-20 August 2003): “High order A-stable numerical methods for stiff problems” (invited lecture)</p> <p>NumDiff 2003, Halle, Germany (8-11 September 2003): “General linear methods for stiff problems” (invited lecture)</p> <p>ICCMSE 2003, Kastoria, Greece (12-16 September 2003): “Some numerical methods for stiff problems” (invited lecture)</p> <p>First Auckland/Waikato Applied Mathematics Day, Albany (31 October 2003): “High order A-stable numerical methods for stiff problems”</p>
Dr Robert Chan	<p>ANODE (14-18 July 2003)</p> <p>Manawatu-Wellington Applied Mathematics Day, Wellington</p> <p>Auckland-Waikato Applied Mathematics Day, Albany Campus, Massey University</p>
Prof Marston Conder	<p>NZMRI summer meeting on Combinatorics, New Plymouth (January 2003)</p> <p>Devonport Topology Festival, Auckland (February 2003)</p> <p>Conference on Groups and Computation, Ohio State University, USA (March 2003)</p> <p>Graph Theory of Brian Alspach, Burnaby BC Canada (May 2003)</p> <p>Algebraic Combinatorics, Koper, Slovenia (June 2003)</p> <p>5th Slovenian International Conference on Graph Theory, Bled, Slovenia (June 2003)</p> <p>Conformal Geometry, Discrete Groups and Surfaces, Bedlewo, Poland (June/July 2003)</p> <p>5th International congress on Industrial & Applied Mathematics: ICIAM 2003, Sydney, Australia (July 2003)</p>
Dr Colin Fox	<p>ICIAM 2003, Sydney (7-11 July)</p>
Prof David Gauld	<p>NZMRI Summer Workshop on combinatorics, New Plymouth (January 2003)</p> <p>Devonport Topology Festival (February 2003)</p>
Dr Rod Gover	<p>Australia-New Zealand Mathematics Convention, Sydney, Australia (July 2003)</p> <p>Conformal structure in Geometry, Analysis and Physics, Palo Alto, California</p>
Dr Paul Hafner	<p>ICIAM 2003</p>
Dr Allison Heard	<p>ANODE 2003, Auckland (14-18 July 2003)</p> <p>Wellington-Manawatu Applied Maths Day</p> <p>Auckland-Waikato Applied Maths Day</p> <p>MERGA, Melbourne (July 2003)</p> <p>Remarkable Delta'03, the Fourth Southern Hemisphere Symposium on undergraduate mathematics and statistics teaching and learning. Queenstown, (November 2003)</p>
Mr Chris King	<p>“Quantum Mind 2003” University of Arizona (March 2003)</p>

Dr Vivien Kirk	Workshop on Pattern Formation, Fort Collins, Colorado (May 19-22) SIAM Meeting on Applications of Dynamical Systems (May 26-31) Modelling Cellular Function (July 5-9) Waiheke First Auckland-Waikato Applied Mathematics Day (31 October) Massey University at Albany
Dr Alastair McNaughton	Operational Research Society of New Zealand (21-22 November) Waikato
Ms Barbara Miller-Reilly	NZ Association of Mathematics Teachers (NZAMT) Conference in Hamilton (8-11 July 2003) Undergraduate Mathematics Education Conference in Queenstown (22-27 November 2003)
Assoc Prof Norman Levenberg	Midwest Several Complex Variables, Univ. of Notre Dame (March) American Math. Soc. Regional Meeting, Indiana Univ. (April) Nordan Several Complex Variables, Sweden (May) International Meeting in Approximation Theory, Vanderbilt Univ. (May) Analysis Conference in honor of L.Carleson, Stockholm (May-June)
Prof Gaven Martin	Miller Conference in the Basic Sciences, Miller Foundation, Berkely California (June 2003) Nevanlinna Colloquium, Jyvaskyla Finland (June 2003) Tri-nations Conference (Australia, Italy & Taiwan) Geometric aspects of Analysis, Batemans Bay, Australia (February 2003) KTH-Stockholm (Arithmetic Kleinian groups) (June 2003)
Dr Michael Meylan	ISOPE Conference, Hawaii (May 2003)
Dr Warren Moors	Devonport Topology Festival (February 2003) Conference in Haifa, Israel (July 2003) Conference in Borovets, Bulgaria (September 2003)
Dr Geoff Nicholls	ICIAM (July 2003) Sydney 18 th International Radiocarbon Conference (September 2003) Wellington Point Processes in Reliability models (September 2003) Wellington Mathematics and Statistics of Complex System: Monte Carlo methods (November 2003) Melbourne
Assoc Prof Eamonn O'Brien	"Groups and Computation" Columbus, Ohio (March 2003) Invited Speaker Representation Theory Workshop, Canberra (June 2003) Invited Speaker
Ms Sheena Parnell	New Zealand Association of Bridging Educators- Manukau Institute of Technology. (September 2003) Remarkable Delta'03, the Fourth Southern Hemisphere Symposium on undergraduate mathematics and statistics teaching and learning. Queenstown, (November 2003)
Ms Judy Paterson	Remarkable Delta'03, the Fourth Southern Hemisphere Symposium on undergraduate mathematics and statistics teaching and learning. Queenstown, (November 2003) Mathematics Education "Around the World: Bridging Policy and Practice: A Focus on Teacher Preparation" Park City, Utah, USA, (July 5 - 9, 2003)
Dr Maxine Pfannkuch	ISI-54 Conference (13-20 Aug) Berlin IASE Satellite Conference (11-12) Berlin Remarkable Delta'03, the Fourth Southern Hemisphere Symposium on undergraduate mathematics and statistics teaching and learning. Queenstown, (November 2003) LOGOS#12 Seminar Day (11 December) Auckland
Prof Ivan Reilly	Devonport Topology Festival (February 2003) Coker Memorial Conference Hacettepe University, Ankara, Turkey (Apr 2003) NZAMT Conference, Hamilton (July 2003) Remarkable DELTA'03, Fourth Southern Hemisphere Symposium on Undergraduate Mathematics Teaching and Learning, Queenstown

	(November 2003) Applied Inverse Problems (May 2003) California
Dr Philip Sharp	Annual conference for the American Astronomical Society's division on Dynamical Astronomy, Cornell University (May 2003)
Dr Arkadiii Slinko	International Symposium on Control Sciences (16-20 June), Moscow, Russia
Prof James Sneyd	GRC conference on Calcium Signaling
Dr Wiremu Solomon	38 th ORSNZ Conference (Hamilton) Third annual conference of The New Zealand Association of Bridging Educators, MIT, Auckland (September 2003) Remarkable Delta'03, the Fourth Southern Hemisphere Symposium on undergraduate mathematics and statistics teaching and learning. Queenstown, (November 2003)
Dr Stephen Taylor	ICIAM 2003, Sydney
Dr Mike Thomas	27 th Conference of the International Group for the Psychology of Mathematics Education, Honolulu, Hawaii (July 2003) Delta'03, the Third Southern Hemisphere Conference on Undergraduate Teaching, Queenstown (November 2003)
Dr Shayne Waldron	Advances in Constructive Approximation, Nashville, Tennessee (May 2003) Constructive Mathematics: A meeting honouring Carl de Boor, Schloss Dagstuhl, Germany (June 2003) Workshop on time-frequency analysis and applications, NUS, Singapore (September 2003)

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.

Dr Hannah Bartholomew: Involved in ongoing work with teachers in decile one and two Manukau schools through the Mathematics Enhancement Project

Assoc. Prof. Bill Barton: Editor Mathematics Education Research Journal, Board Member, Educational Studies in Mathematics, Board Member for The Learning of Mathematics, Evaluator: Royal Society of New Zealand 2004 Fellowship Scheme

Dr Paul Bonnington: Chief 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.

Prof John Butcher: Member of the Editorial board of Applied Numerical Mathematics, Numerical Algorithms, Journal of the New Zealand Mathematical Society, Acta Numerica

Dr Robert Chan: member of the ANODE 2003 Organising Committee.

Prof. Marston Conder: Director of NZ Institute of Mathematics & its Applications (Mathematical Sciences CoRE), Member of Marsden Fund Council and Convenor of its Mathematical & Information Sciences Panel, Member of Top Achiever Doctoral Scholarships Advisory Committee, Member of Governing Board of Centre for Molecular Biodiscovery, Chair of Bioengineering Institute's Advisory Board, Co-director (and Treasurer) of NZ Mathematical Research Institute, Member of RSNZ Academy Council, Member of Performance-based Research Funding (PBRF) Design Advisory Group, Member of Sector Expert Group for Tertiary Funding Category Review, Member of FRST's Advisory Group on International Collaboration/Investment, Member of Grafton Hall Board, Member of Editorial Board of N.Z Journal of Mathematics, Member of Scientific Committee for Banach Center Conference on Conformal Geometry, Discrete Groups and Surfaces (held at Bedlewo, Poland, June/July 2003).

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

Dr Rod Gover: Joint Organizer of the AIM and NSF funded workshop ‘Conformal structure in geometry, analysis and physics’ at the American Institute of Mathematics, Palo Alto, California. (Aug 12-16)

Dr Allison Heard: Member of the Organising Committee of ANODE 03, Organising Committee member of Mathematics in Industry Study Group, Secretary/Treasurer of ANZIAM (NZ Branch)

Mr Chris King: Contributions to Scientific debates on GM and its impact on biodiversity, maintenance and development of a research data base on all developments in genetic and reproductive technologies, hosting discussion lists on biodiversity and genetic technologies

Dr Alastair McNaughton: Member of council for Operational Research Society, Contributed 2 workshops on problem solving for the International Mathematics Olympiad

Ms Barbara Miller-Reilly: New Zealand contact for Australasian Bridging Mathematics Network, New Zealand agent for the European Organization Adults Learning Mathematics.

Mr Greg Oates: Member of the Organising, Publishing and Programme Committee for DELTA ’03, November 2003, Queenstown. Marker and supervisor at Auckland Mathematical Olympiad, May 2003, Assisted with the Orientation Programme for students with The University of California Education Abroad Program. Co-Guest Editor for the Proceedings of Remarkable Delta’ 03, the Fourth Southern Hemisphere Symposium on undergraduate mathematics and statistics teaching and learning.

Assoc. Prof. Eamonn O’Brien: Associate Editor (Group Theory) for Journal of the Australian Mathematical Society, Member of the GAP Council, Grant assessor for NSA, NSF, Italian Ministry, EPSERC.

Ms Judy Paterson : Involved in ongoing work with teachers in decile one and two Manukau schools through the Mathematics Enhancement Project, presented a professional development session to a group of South African secondary teachers in Stellenbosch, South Africa under the auspices of AIMSSEC, the secondary wing of AIMS, the newly established African Institute for Mathematical Sciences in Muizenberg, CapeTown, Mentor and referee for graduands of the Diploma in Teaching Programme.

Dr Maxine Pfannkuch: ISI-54 Session organizer for conference in 2003, IASE national correspondent-write a regular column for the NZSA newsletter, NZSA education committee

Prof. Ivan Reilly: (Foundation) Chair of the NZ Mathematical Olympiad Committee, (Foundation) Chair of the NZ Mathematics Enrichment Trust, NZ Liaison Officer, under NZVCC auspices, of the University of California Education Abroad Program, External Examiner in Mathematics and Mathematics Education for National Institute of Education (NIE), Nanyang Technological University, Singapore, 2002-2004, Member of the International Advisory Board of the Indian Journal of Pure and Applied Mathematics, Indian National Academy of Science, New Delhi, Member of the International Steering Committee for the DELTA Conferences on Undergraduate Mathematics Education, Co-convenor of DELTA 03, the fourth Southern Hemisphere Symposium on Undergraduate Mathematics Education, Queenstown, NZ, November 2003, Editor of the Communications of Remarkable Delta’03, Fourth Southern Hemisphere Symposium on Undergraduate Mathematics and Statistics Teaching and Learning, Queenstown, New Zealand, November 2003, International Delta Steering Committee

Dr Joel Schiff: Executive Editor of the New Zealand Journal of Mathematics, Editor/Publisher of the International Quarterly Journal – Meteorite

Dr Arkadii Slinko: Leader of the NZ Mathematical Olympiad team for 2003-2005, Organiser (jointly with Gordon Hookins) of the Auckland Mathematics Olympiad.

Prof. James Sneyd: Member of the Governing Board of NZ Institute of Mathematics & its Applications (NZIMA) (Mathematical Sciences CoRE), Organiser of two workshops at the Mathematical Biosciences Institute of The Ohio State University, Member of the Organising committee of Modelling Cellular Function, Waiheke Island, Auckland, July 2003. Chair of the NZ branch of ANZIAM.

Dr Stephen Taylor: Member of the Mathematics in Industry Study Group Reference Group

Dr Michael Thomas: Associate Editor of the Mathematics Education Research Journal (international journal), Editor of the New Zealand Mathematics Magazine, Member of the Executive of the Auckland Mathematics Association, Programme Committee member and Proceeding Editor for DELTA'03, the Third Southern Hemisphere Conference on Undergraduate Teaching, Queenstown, 2003, National NCEA scholarship examiner

VII. OTHER MATTERS

Staffing

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

Dr Michael Thomas	to Associate Professor
Dr Paul Bonnington	over Senior Lecturer bar
Dr Rod Gover	over Senior Lecturer bar
Mr Greg Oates	over Senior Tutor bar
Ms Moira Statham	over Senior tutor bar

Awards

Prof Gaven Martin	Research Fellow, Institute Mittag Leffler, Royal Swedish Academy of Sciences James Cook Fellowship (continuation)
Dr Rod Gover	Maclaurin Fellowship

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, Assoc. Prof. Bill Barton, Prof. Marston Conder, Dr Rod Gover, Dr Paul Hafner, Dr Vivien Kirk, Ms Daniela Rovere
Department Staffing Advisory Committee	Assoc. Prof. Bill Barton, Prof. Gaven Martin Assoc. Prof. Eamonn O'Brien, Dr Maxine Pfannkuch, Prof. James Sneyd
Research and Postgraduate Committee	Prof. Marston Conder, Dr Rod Gover, Dr Sina Greenwood, Dr Philip Sharp, Prof. James Sneyd, Dr Mike Thomas, Dr Shayne Waldron
Computer Committee	Dr Paul Bonnington, Dr David McIntyre Assoc. Prof. Eamonn O'Brien, Dr Philip Sharp, Dr Mike Thomas
Publicity Committee	Mr Chris King, Ms Min-Young Lee, Ms Daniela Rovere, Dr David Smith, Dr Steve Taylor
Academic Staff Performance Reviewers	Prof. Boris Pavlov, Prof. Ivan Reilly, Prof. James Sneyd
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 Shayne Waldron
Director of Graduate Studies Masters and Postgraduate Diploma	Mr David Alcorn, Dr Rod Gover, Dr Philip Sharp
Teaching Co-ordinator	Dr Paul Hafner
Research Co-ordinator	Prof. Marston Conder
Computing Services Co-ordinator	Assoc Prof Eamonn O'Brien
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
Examinations Results Processing	Dr David McIntyre
Publicity Officer	Mr Chris King

Regulations/Handbooks	Dr David Smith
EEO/EEo Representative	Mr Viliami Latu
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
Summer Research Scholarships Co-ordinator	Dr Anthony Blaom
Organiser of the Undergraduate Laboratories	Dr Allison Heard
Markers Co-ordinator	Mr Roy Swenson
Markers Co-ordinator (Tamaki)	Dr Alastair McNaughton
Department Research Report Series	Ms Olita Moala
Safety Officer	Ms Daniela Rovere
Seminars: Algebra, Geometry & Combinatorics Analysis Applied, Computational & Industrial Maths Topology Department Colloquia MESS (Mathematics Education) GRID (Mathematics Education)	Assoc. Prof. Eamonn O'Brien Dr Shayne Waldron Dr Philip Sharp Dr Sina Greenwood Assoc. Prof. Eamonn O'Brien Dr Hannah Bartholomew, Ms Barbara Miller-Reilly Dr Maxine Pfannkuch
Faculty Representatives: Arts Business and Commerce Engineering	Mr David Alcorn Dr Joel Schiff Assoc Prof. Bruce Calvert
Ethics Advisor	Dr Mike Thomas

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: Associate Dean (IT) Faculty of Science, Chair – Faculty of Science IT Committee (Academic), Chair - Working Group University IT Strategy and Policy Committee, University Web Governance Board, University IT Faculties Forum.

Assoc. Prof. Bill Barton: Faculty of Science Chair of Foundation Studies.

Assoc. Prof. Bruce Calvert: Member of Science Faculty EO Committee, Member of Teaching and Learning Committee of Senate.

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

Prof. Marston Conder: Chair of the University of Auckland Budget Committee, Member of Vice-Chancellor's Advisory Committee, Member of Assessment Panel for bids to TEC's Capability Development Fund, Member of Vice-Chancellor's Advisory Group on Government Relations, Member of Search Committee for new Vice Chancellor.

Dr Colin Fox: Head of the Acoustics Research Centre

Prof. David Gauld: Faculty of Science Staff Advisory Committee, member of PGSF Internal grading Panel.

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

Dr Paul Hafner: Member of Lecture Theatre Advisory Board, member of CUTL Monitoring Group.

Dr David McIntyre: Member of the University of Auckland Information Technology Faculties Forum, Science Faculty IT Committee.

Dr Geoff Nicholls: Member of the University of Auckland Bioinformatics Institute.

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: Member of the University of Auckland Education Committee, Board of Studies in Education, Board of Foundation Studies.

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

Ms W Stratton: Member of the University of Year 13 Studies 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 Min-Young Lee (Editorial Assistant), and Ms Betty Fong (Production Assistant). Two issues of Volume 32 (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 convener 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. 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. Her assistant Ajita Pendharkar left in the middle of the year and was replaced by Min-Ah Lee. The general office staff continue to work wonders. The computer support staff are available often at strange times of the week to rectify problems before they become severe. Finally I thank the Department Manager, Ms Daniela Rovere, who between battling with Peoplesoft and myriads of other tasks manages to give us all a cheery smile.

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 very few.

David Gauld
Professor and Head of the Department of Mathematics

2 February, 2004