DEPARTMENT OF MATHEMATICS
ANNUAL REPORT 2005

PREAMBLE

The Department of Mathematics comprises over 60 established and temporary staff, based on both the City and Tamaki campuses. The number of equivalent full-time students totalled about 851 in 2005. The Department is therefore one of the largest in the University of Auckland, and offers courses at all levels for students in several Faculties.

Highlights for the Department in 2005 were:

- Professor James Sneyd was elected as a Fellow of the Royal Society of New Zealand.
- Professor James Sneyd was a joint winner of the NZ Mathematical Society 2005 Research Award.
- Professor Boris Pavlov, Dr Colin Fox, and Dr Mike Meylan won funding for an NZIMA's thematic programme in 2006/07.
- Marsden Grants were awarded in the 2005 round to both Professor David Gauld and Dr David Bryant.
- Professor James Sneyd won a grant from the University of Massachusetts Medical Centre, and has had his NIH grant for an international project fully funded for the next five years
- Dr Arkadii Slinko became a founding member of the ARC Economic Design Network which received $AU300,000 per year from the Australian Research Council for the next 5 years.
- Dr Arkadii Slinko led the New Zealand International Mathematics Olympiad team to its best ever results in the competition in Mexico. One silver and two bronze medals put us in the top half of all teams, not far behind France.
- The Department, jointly with DALSL, signed an agreement with Majlis Amanah Rakyat (MARA) in Malaysia to provide a 20-week course for 25 mathematics and science teachers.
- Associate Professor Paul Bonnington was the lead bidder in a successful application to TEC to build digital science capability in New Zealand. This bid involves three partner institutions, and is worth about $2 million in the first year
- Dr Sasha Rubin was awarded a UoA Best Doctoral Thesis Award. He was jointly supervised between Mathematics and Computer Science.

Dr Paul Bonnington was promoted to Associate Professor, and Ms Sheena Parnell to Senior Tutor over the bar during the 2005 round.

The Department hosted several post-doctoral students at various stages of the year: Drs Jiling Cao, Richard Evans (NZIMA), John Holt, Bart Oldeman (NZIMA), Primoz Potocnik (NZIMA), Jana Sagiova (NZIMA), Edward Huang (NZ Science & Technology), Caroline Poisard (HOD), Laura Ciobanu (University of Auckland), and Paul-Andi Nagi (University of Auckland).

After more than 30 years service we farewelled Mr David Alcorn. As Deputy HoD for many years, Mr Alcorn's service to the Department has been extremely valuable and he creates a large gap in our student support and regulations administration. We were delighted to make a new appointment in Analysis to replace the departures of 2004. Dr Tom ter Elst from Eindhoven Technological University has arrived to commence duties for the start of 2006. We were also very happy to welcome Dr David Bryant who joined us in July from McGill University, but Dr Jeff Nicholls (to Oxford University) and Dr David McIntyre (to the private sector) left during the year. In addition we have several new general staff members: Ms Patricia Rood, Ms Kristin Osborne, Mr Vincent Chung, and Mr Nic Brown are all warmly welcomed to the Department to replace Ms Ming Young Lee, Mr Eddie Clark, and Mr John Rogers

I. DEVELOPMENTS IN TEACHING AND LEARNING

The Department provides teaching in courses for students in several Faculties, especially Arts, Business & Economics, Engineering, and Science. A major part of this is service teaching as mathematics provides a crucial part of many different majors.

For the 2005 academic year student enrolments totalled approximately 851 EFTS, including 781 undergraduate (739 on City and 41 on Tamaki Campuses), and 70 graduate EFTS, including 20 doctoral students.

After the rearrangement of courses in 2004, 2005 saw a comprehensive revision of all undergraduate courses so that they complied with the new regulations. The opportunity was taken to realign curricula more carefully between courses as they were reduced to become 15-credit courses. This revision required each sub-section of the Department (Algebra, Analysis, Applied Mathematics, and Mathematics Education) to conduct meetings to determine content at each level, and then development committees for each major undergraduate course to negotiate the content into an appropriate structure.

The opportunity was also taken to review delivery and assessment procedures, leading to some significant changes, such as the adoption of a single textbook package that will carry students through 100- and 200-level courses; and the adoption of MatLab as a computer platform to be used by all undergraduate mathematics students. Departmental seminars using lecturers from other departments talking about innovative delivery techniques were part of this review. Also part of this review was the development of a new 100-level General Education course MATHS 190 aimed at non-science students. This will be taught by some of the best teachers in the Department. MATHS 101 is also adapted for General Education, although both these courses may be taken as part of a Science degree.

Another innovation was the appointment of an Undergraduate Coordinator, and a team of people (known as the Mathematics Learning Centre) to focus on services for undergraduates. This group has instituted regular visits to 100- and 200- lectures, and the formation of a group of the best performing undergraduates to receive special attention (Undergraduate Mathematics Community).

We are excited at the prospect of finally getting proper space to receive and tutor mathematics students in the 303 Building Renovations (see last year's report). We are also delighted that the Faculty has granted us access to rooms at the entrance to Building 303 in the interim so that we can properly interface with existing and prospective mathematics students.

The high-level Number Theory course MATHS 741 that had not been taught for many years was again offered in 2005.

This section needs to mention the increasingly successful MAX course – a year-long version of MATHS 150 for top secondary students. This course continues to attract the very best students from both Auckland and wider afield into the University of Auckland, and gives them a kick-start in whatever programme they wish to enter by succeeding at 100-level mathematics before becoming full-time students.

II. OTHER STUDENT MATTERS

Department of Mathematics pass rates continue to be some of the lowest in the university. This is a subject of our attention and has been addressed within the revisions to undergraduate courses described above (see Section I). However, it should be noted that part of this issue is a result of service teaching where underprepared students are forced into mathematics courses for which they are under-prepared in order to try to gain entry into other degree programmes. The Department of Mathematics continues to try to identify these students, advise them clearly about their course choices, and support those who are in a difficult position. We regard this as part of our service to the wider university community.

We are also aware that many ESOL students take mathematics because they have a good background in it, and feel that it is relatively language-free. Our own research tells us that this may be an effective strategy at 100-level, but that at 200- and 300-level, English language proficiency becomes a critical factor. This explains why mathematics is the only Department whose pass rates at 200- and 300-level are the same as 100-level courses.

In 2005 we had six doctoral completions and four new doctoral enrolments, bringing our current number of doctoral students to twenty.

Scholarships and Prizes
Senior Scholarship in Applied Mathematics: (joint award) Emily Harvey and Jeremy Holmes
Senior Scholarship in Mathematics: Peijie Lin
Annual Prize in Applied Mathematics: Simon Young
Annual Prize in Mathematics: Eyal Loz
Collins Prize: Robin Christian
Margaret Morton Memorial Prize: Hecy Wei Han Su
Mathematics Education Prize: Joanne Woodward
Mathematics Education Technology: Prize Joann Palmer

Summer Scholarships
Thirty students were engaged in research projects over the summer 2005-6, 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. 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 are pleased to see this being centralized as a function of the Faculty of Science.

Aldis Scholarships
These scholarships are discussed in more detail in Section IV. They are awarded to very able students from decile 1 and 2 High Schools to enable them to enrol in a Summer Season course in Mathematics.

Student/Staff Liaison Committee
Mr Greg Oates continued to convene this Committee. The meetings continue to attract a full room of student and staff representatives with a range of important issues discussed.

Tutor Training
The Department of Mathematics has long organized a tutor training course under the direction of Mr Greg Oates. In 2005, this course became a model for the CPD of a department-oriented course, and its certificate was adopted by the Faculty of Science.

III. EQUAL OPPORTUNITIES

While a significant number of mathematically gifted people are female, women are still in the minority amongst our students; 40% of our students are female. This situation carries on to the pool of candidates for appointment to the Academic staff of the Department. Only five of the 36 permanent Academic staff and six of the 13 long-term contract Academic staff are female. Typically, few of the applicants for permanent academic positions are female.

Over half of students enrolled in Mathematics are of ethnic Asian origin, so the two permanent and one contract staff members who are themselves of Chinese origin are used within the Department as liaison and support for these students. We also have many tutors who are able to, and frequently do, conduct their tutoring sessions with individuals or in groups in the Mandarin language where this is appropriate.

A similar situation on a smaller scale applies to Maori and Pasifika students. Through the Tuakana programme and the efforts of the three staff members (a Maori, a Tongan and a Samoan) involved, students from these backgrounds are able to study together in a culturally supportive environment and receive support in their language in many cases.

The Department makes special efforts both with the mathematically able and those needing extra support. The Max programme for talented students still in their final year of school, and the Department's involvement in the International Mathematics Olympiad programme are examples of the former. For students needing support or a second chance, the Mathematics Department continues its strong support of the Tertiary Foundation Certificate. At the May graduation we were pleased that seven students from the TFC graduated, five with a BSc.

The Department is also involved with low-decile schools in the Manukau region in an on-going development project aimed at senior students. This includes both school visits and bringing student into the university for orientation. Another part of the project is the purchase of public art works with a mathematical theme and using them to promote mathematics within the Manukau community.

IV. TREATY OF WAITANGI

As noted in last year's report, the Department of Mathematics has a long history of serious attention to responsibilities under the treaty. Its on-going Maori and Pasifika programme led by Dr Sina Greenwood assisted by Mr Garry Nathan and Mr Viliami Latu, has been successful in attracting and retaining Maori and Pasifika students—although the numbers are still acknowledged to be low. The programme continues to build a group of trained mentors and role-models, and uses them in attracting new students and supporting existing ones.

A significant part of this effort is the awarding of Aldis Scholarships. In 2005 there were 20 Aldis Scholars, and the May graduation saw the first Aldis graduands awarded their degrees. Since this programme is also a service function in that Aldis scholars enter programmes in many different Faculties and Departments other than Mathematics, we are delighted that this is likely to be funded centrally from 2006. We retain a commitment to administering the programme.

V. RESEARCH

The Department continues to perform as the top Mathematics Department in New Zealand, and on a par with the best in Australia. Yet again a member of the department won the NZ Mathematical Research Award; yet again a member of the Department is elected as a Fellow of the Royal Society of New Zealand; yet again the Department does well in the Marsden Funding round; yet again the Department's publication list includes the top journals in the field and a wide variety of sub-areas within mathematics are included; and yet again our graduate students win significant awards and scholarships.

It is a measure of the strength of the Department of Mathematics' research profile that we host many international conferences and workshops, averaging one every two months. In 2005, there were the following:

- Associate Professor Paul Bonnington organised a conference in December, 2004 as part of an NZIMA Combinatorics programme. This attracted participants from NZ 38, Australia 28, North America 33, Europe 21, Asia 27, Chile 1, SA 1.
- Associate Professor Eamonn O'Brien organised a workshop in January and conference in February as part of the NZIMA Geometry Program. This has visitors from leading institutions such as Universities at Berkeley, Princeton, Imperial, Jerusalem. The conference attracted 43 overseas participants.
- The 8th Devonport Topology Festival was organised by Dr Sina Greenwood in February 2005. It included speakers from Massey@Albany, Waikato, Ehime (Japan), and Galway (Ireland) as well as Auckland.
- An NZIMA funded one-day meeting on Dynamical Systems and Numerical Analysis was hosted in the Department on July 5th, attracting 30 academics including participants from Australia, USA and UK.
- Dr Maxine Pfannkuch hosted an International Statistics conference (SRTL-4) in July, with 20 international participants in a 6-day residential event.
- The 2005 Upper North Island Applied Mathematics Day was held in the department on September 9. There were speakers from Massey (Albany), Auckland and Waikato.
- A two-day workshop on Group Theory was organized by Associate Professor Eamonn O'Brien in November. Featuring lectures by speakers from universities in Australia, Germany, UK and NZ, it attracted 35 participants.

Also notable were the translation of Professor James Sneyd's book translated into Japanese and the republishing by Dover of Professor David Gauld's 1982 book "Differential Topology: An Introduction".

There are two areas that are notable for increased activity in 2005. Professor James Sneyd's work is an example of work that is internationally recognized and is being rewarded with international funding: an NSF grant and another from the University of Massachusetts Medical Centre. With funding also being attracted from Australia (Dr Arkadii Slinko) and Berkeley (Associate Professor Rod Gover) this is continued evidence of the Department's ability to participate in international research activity.

In 2005 there has also been a new activity, that of externally funded consultancy and development work emanating from the research activities of staff members. Professor James Sneyd has a consultancy contract with Rakon that will, in turn, lead to new research areas, and the work with NZ Steel is resulting in joint supervision with students in Chemical Engineering. The Malaysian teacher development project, and the on-going MEP project in Manukau Schools are both examples of fully funded development projects in Mathematics Education.

Last year's report listed six examples of high level research to illustrate the width of work in Pure and Applied Mathematics in the Department. This work continues, as is evidenced in the list of activities, visits and visitors, grants, and publications below. This year I highlight the research in Mathematics Education, in particular the strength in tertiary level mathematics education. This Department had twice

the representation of any university at the international conference in this field held in Australia, both in attendance and refereed presentations. The Department has been highly successful in attracting the NZ Ministry of Education's Teaching & Learning Research Initiative (TLRI) funding with large grants in each of the last two years.

PUBLICATIONS, CREATIVE WORKS AND OTHER RESEARCH OUTPUTS

Book - Authored

HOLT, D.F., EICK, B., O'BRIEN, E.A. *Handbook of computational group theory*, Boca Raton, FL, Chapman and Hall, p1-505, 2005

KING, C.C., FIELDER, C.A. *Sexual Paradox : Complementarity, Reproductive Conflict and Human Emergence*, (2ndedn), USA, WED, p1-560, 2005

Book - Chapter

CHICK, H.L., PFANNKUCH, M., WATSON, J.M. 'Transnumerative thinking: Finding and telling stories within data', In:A. Begg(ed.), *Curriculum matters*., Wellington, New Zealand Council for Educational Research, p.87-108, 2005

KING, C.C. 'Quantum Cosmology and the Hard Problem of the Conscious Brain Towards a Physics of Consciousness', In:Tuszynski, Jack(ed.), *The Emerging Physics of Consciousness*., Germany, Springer-Verlag, p.365-404, 2005

PFANNKUCH, M. 'Probability and statistical inference: How can teachers enable learners to make the connection?', In:G. Jones(ed.), *Exploring probability in school: Challenges for teaching and learning*., New York, Kluwer/Springer Academic Publishers, p.267-294, 2005

Conference Contribution - Abstract

KORAY, S., SLINKO, A.M. 'Self-Selective Social Choice Functions', *2nd Pan-Pacific Conference on Game Theory*, *Taipei*, *22-24 November*, 2005, p.25-25

PAVLOV, B., YAFYASOV, A.M. 'Spin-dependent resonance transmission across the Quantum well', *International Conference on Nanoelectronics, Nanostructures, and Carrier Interaction NNCI 2005*, *Atsugi, Kanagawa*, *30 January 2005 to 02 February 2005*, 2005, p.147-147

Conference Contribution - Oral Presentation
See Section VI. Staff Leave and Conferences

Conference Contribution - Other

BARTHOLOMEW, H., BARTON, B., KENSINGTON-MILLER, B.A., PATERSON, J.E. 'Mathematics teacher development in low socio-economic areas.', *15th ICMI Study on The Professional Education and Development of Teachers of Mathematics*, *Aduas de Lindoia, Brazil*, *May 16 - May 20th*, 2005

Conference Contribution - Conference Paper

BARTON, B., CHAN, R.P.K., KING, C.C., NEVILLE-BARTON, P., SNEDDON, J.D. 'EAL Undergraduates Learning Mathematics', *DELTA-05*, *Fraser Island, Australia*, 21-26 November, 2005

BOSSERT, W., SLINKO, A.M. 'Relative Uncertainty Aversion and Additively Representable Set Rankings', *23rd Australasian Economic Theory Workshop*, *Auckland*, 23-24 February, 2005

CHRISTIAN, R., FELLOWS, M., ROSAMOND, F., SLINKO, A.M. 'On Complexity of Lobbying in Multiple Referenda', *Logic, Game Theory and Social Choice 4*, *Caen, France*, 22-24 June, 2005

CONDER, M.D.E. 'Chiral regular maps and related matters', *Graph Embeddings and Maps on Surfaces*, *Stara Lesna, Slovakia*, 26 June - 1 July, 2005

CONDER, M.D.E. 'Highly transitive imprimitivities', *2005 NZ Mathematics Colloquium*, *Palmerston*

North, NZ, 5-7 December 2005, 2005

CONDER, M.D.E. 'Highly transitive imprimitivities', *Joint meeting of American, Austrian & German Mathematical Societies*, *Mainz, Germany*, 16-19 June, 2005

CONDER, M.D.E. 'Hyperbolic 4-manifolds of small volume', *Geometry: Interactions with Algebra and Analysis*, *Auckland, NZ*, 14-18 February, 2005

CONDER, M.D.E. 'Symmetries of Cayley graphs and graphs underlying regular maps', *Graph Theory with Altitude*, *Denver, Colorado*, 16-20 May, 2005

CONDER, M.D.E. 'The NZ Institute of Mathematics & its Applications', *Pacific Rim Mathematical Forum*, *Banff, Alberta*, 13-16 October, 2005

EVANS, D.V., MEYLAN, M.H. 'Scattering of flexural waves by a pinned thin elastic sheet floating on water', *20th International Workshop on Water Waves and Floating Bodies*, *Svalbard*, May, 2005

KORAY, S., SLINKO, A.M. 'Self-Selective Social Choice Functions', *2nd Pan-Pacific Conference on Game Theory*, *Taipei*, 24-26 November, 2005, http://140.109.121.114/2ndconference/Duality18.pdf

MCNAUGHTON, A.J. 'The Area Restricted Forest Harvesting Problem', *IFORS 2005*, *Hawaii*, July 11-15, 2005

OATES, G., PATERSON, J.E., REILLY, I.L., STATHAM, M.A. 'Effective tutorial programmes in tertiary mathematics', *DELTA-05*, *Fraser Island*, 21-26 November, 2005

PATERSON, J.E. 'Using Mathematics to open up windows in teachers minds: Encouraging teacher talk about learning and teaching.', *Fifth Southern Hemisphere Conference on Undergraduate Mathematics and Statistics Teaching and Learning (Kingfisher Delta '05)*, *Fraser Island, Queensland, Australia*, 22-26 November, 2005

Conference Contribution - Paper Published in Proceedings

BARTON, B., PATERSON, J.E., KENSINGTON-MILLER, B.A., BARTHOLOMEW, H. 'Dodging the dragon: Strategies for mathematics professional development in low socio-economic areas.', *Mathematics, Education and Society 4*, Goos, Merrilyn Kanes, Clive Brown, Raymond(ed.), *Proceedings of the 4th International Mathematics, Education and Society Conference*, *Gold Coast, Australia*, *July 4 - July 6*, 2005, p.78-87

DELOS SANTOS, A.G., THOMAS, M.O.J. 'The growth of schematic thinking about derivative', *Building connections: Theory, research and practice*, P. Clarkson, A. Downton, D. Gronn, M. Horne, A. McDonough, R. Pierce, & A. Roche(ed.), *Proceedings of the 28th Mathematics Education Research Group of Australasia Conference*, 1, *Melbourne, Australia*, *July*, 2005, p.377-384

MARCHANT, T., NICKERSON, A., SCOTT, D.J., TAYLOR, S.W. 'Development of empirical relationships for the metallurgical design of hot-rolled steel', *MISG 2005*, Graeme Wake(ed.), *Proceedings of the Mathematics-In-Industry Study Group 2005*, *Massey University, Albany*, *February 2005*, 2005, p.55-70

MCGUINNESS, M., TAYLOR, S.W. 'Strip temperature in a metal coating line annealing furnace', *MISG 2004*, Graeme Wake(ed.), *Proceedings of the Mathematics-In-Industry Study Group 2004*, *Massey University, Albany, New Zealand*, *February 2004*, 2005, p.23-45

PFANNKUCH, M. 'Informal inferential reasoning: A case study', *The Fourth International Research Forum on Statistical Reasoning, Thinking, and Literacy*, K. Makar(ed.), *Reasoning about distribution: A collection of research studies*, *Auckland*, *2-7 July 2005*, 2005, p.1-23, CD-ROM

PFANNKUCH, M., HORRING, J. 'Developing statistical thinking in a secondary school: A collaborative curriculum development', *International Association for Statistical Education (IASE) Roundtable*, G. Burrill, M. Camden, G. Breaux(ed.), *Curricular development in statistics education*, *Lund, Sweden*, *28 June - 3 July 2004*, 2005, p.204-218, http://www.stat.auckland.ac.nz/~iase/publications.php?show=RT04

MARSHALL, S. 'On Extremal Cones and Comparative Probability Orderings', *The 4th International Symposium on Imprecise Probabilities and Their Applications (ISIPTA 05)*, Cozman, G., Nau, R., Seidenfeld, T.(ed.), *ISIPTA'05 Electronic Proceedings*, *Pittsburg*, *20-23 July*, 2005, p.246-255, http://www.sipta.org/isipta05/proceedings/030.html

SLINKO, A.M., CHRISTIAN, R. 'Answers to Two Questions of Fishburn on Subset Comparisons in Comparative Probability Orderings', *The 4th International Symposium on Imprecise Probabilities and Their Applications (ISIPTA 05)*, Cozman, G., Nau, R., Seidenfeld, T.(ed.), *ISIPTA '05. Proceedings*, *Pittsburg, Pensylvania*, *20-23 July, 2005*, 2005, p.117-124, http://www.sipta.org/isipta05/proceedings/051.html

STEWART, S., THOMAS, M.O.J. 'University student perceptions of CAS Use in mathematics learning', *Conference of the International Group for the Psychology of Mathematics Education*, H. L. Chick & J. L. Vincent(ed.), *Proceedings of the 29th Conference of the International Group for the Psychology of Mathematics Educ*, 4, *Melbourne, Australia*, *July*, 2005, p.233-240

TEE, G.J. 'Eigenvectors of block circulant and alternating circulant matrices', *14th International Workshop on Matrices and Statistics*, *Research Letters in the Information and Mathematical Sciences 8*, *Massey University, Albany*, *29 March - 1 April*, 2005, p.123-142

THOMAS, M.O.J., HONG, Y.Y. 'Teacher factors in integration of graphic calculators into mathematics learning', *Conference of the International Group for the Psychology of Mathematics Education*, H. L. Chick & J. L. Vincent(ed.), *Proceedings of the 29th Conference of the International Group for the Psychology of Mathematics Educ*, 4, *Melbourne, Australia*, *July*, 2005, p.257-264

Journal - Research Article

AFIMEIMOUNGA, H., SOLOMON, W., ZIEDINS, I.B. 'The Downs-Thomson paradox: existence, uniqueness and stability of user equilibria', *Queueing Systems*, *49*, p321-334, 2005

AN, J. 'Uno's invariant conjecture for the general linear and unitary groups in nondefining characteristics', *Journal of Algebra*, *284*, p462-479, 2005

AN, J., EATON, C.W. 'Modular representation theory of blocks with trivial intersection defect groups', *Algebras And Representation Theory*, *8*, p427-448, 2005

AN, J., O'BRIEN, E.A. 'The Alperin and Uno conjectures for the Fischer simple group Fi22', *Communications in Algebra*, *33*, *(5)*, p1529-1557, 2005

BAGRAEV, N.T., MIKHAILOVA, A.B., PAVLOV, B., PROKHOROV, L.V., YAFYASOV, A.M. 'Parameter regime of a resonance quantum switch', *Physical Review B*, *71*, p1-16, 2005

BARTON, B., CHAN, R.P.K., KING, C.C., NEVILLE-BARTON,, P., SNEDDON, J.D. 'EAL Undergraduates Learning Mathematics', *International Journal of Mathematical Education in Science and Technology*, *36*, *(7)*, p721-729, 2005

BASKORO, E.T., MILLER, M., SUTTON, M., SIRÁN, J. 'Complete characterization of almost Moore digraphs of degree three', *Journal of Graph Theory*, *48*, p112-126, 2005

BREDA D'AZEVEDO, A., NEDELA, R., SIRÁN, J. 'Classification of regular maps of negative prime Euler characteristic', *Transactions of the American Mathematical Society*, *357*, *(10)*, p4175-4190, 2005

BUTCHER, J.C., HOJJATI, G. 'Second derivative methods with RK stability', *Numerical Algorithms*, *40*, p415-429, 2005, 1572-9265 (Online)

BUTCHER, J.C., RATTENBURY, N. 'ARK methods for stiff problems', *Applied Numerical Mathematics*, *53*, p165-181, 2005

CALVERT, B.D. 'Resistive Networks with Monotone N-Ports.', *Journal of Nonlinear and Convex Analysis*, *6*, *(1)*, p153-163, 2005

CALVERT, B.D., GUPTA, C.P. 'Existence and uniqueness of solutions to a super-linear three-point boundary-value problem.', *Electronic Journal of Differential Equations*, *2005*, p1-21, 2005

CAO, J. 'Generalized metric properties and kernels of set-valued maps', *Topology and its Applications*, *146/147*, p603-609, 2005, http://www.elsevier.com/wps/find/journaldescription.cws_home/505624/description#description

CAO, J., GANSTER, M., REILLY, I.L., STEINER, M. 'δ-closure, θ-closure and generalized closed sets', *Applied General Topology*, *6*, *(1)*, p79-86, 2005

CAO, J., GAULD, D.B. 'Volterra spaces revisited', *Journal Of The Australian Mathematical Society*, *79*, *(1)*, p61-76, 2005, http://www.austms.org.au/Publ/JAustMS/V79P1/contents.html

CAO, J., KUNZI, H.P., REILLY, I.L. 'Hausdorff quasi-uniformities inducing the same hypertopologies', *Publicationes Mathematicae Debrecen*, *67*, *(1)*, p27-40, 2005, http://www.math.klte.hu/publi/contents.php?szam=40

CHAN, T.M., CHAN, R.P.K. 'A Simplified Approach to the Order Conditions of Integration Methods', *Computing*, *76*, *(4)*, p1-16, 2005

CONDER, M.D.E., DOBCSANYI, P. 'Applications and adaptations of the low index subgroups procedure', *Mathematics of Computation*, *74*, p485-497, 2005

CONDER, M.D.E., MACLACHLAN, C. 'Compact hyperbolic 4-manifolds of small volume', *Proceedings of the American Mathematical Society*, *133*, p2469-2476, 2005

CONDER, M.D.E., MARUSIC, D., MALNIC, A., POTOCNIK, P. 'The edge- but not vertex-transitive cubic graph on 112 vertices', *Journal of Graph Theory*, *50*, p25-42, 2005

FLANNERY, D.L., O'BRIEN, E.A. 'Linear groups of small degree over finite fields', *International Journal of Algebra and Computation*, *15*, *(3)*, p467-502, 2005

GAULD, D.B., MYNARD, F. 'Metrisability of Manifolds in terms of Function Spaces', *Houston Journal of Mathematics*, *31*, p199-214, 2005

GILL, P.M.W., GILBERT, A.T.B., TAYLOR, S.W., FRIESECKE, G., HEAD-GORDON, M. 'Decay behavior of least-squares coefficients in auxiliary basis expansions', *Journal of Chemical Physics*, *123*, *(6)*, p061101-1-061101-4, 2005

GOVER, A.R., BRANSON, T. 'Conformally invariant operators, differential forms, cohomology and a generalisation of Q-curvature', *Communications in Partial Differential Equations*, *30*, *(11)*, p1611-1669, 2005

GOVER, A.R., GRAHAM, C.R. 'CR invariant powers of the sub-Laplacian', *Journal fur die Reine und Angewandte Mathematik*, *583*, p1-27, 2005

GRAHAM, A.T., THOMAS, M.O.J. 'Representational versatility in learning statistics', *International Journal of Technology in Mathematical Education*, *12*, *(1)*, p3-14, 2005

GRANNELL, M.J., GRIGGS, T.S., SIRÁN, J. 'Maximum genus embeddings of Steiner triple systems', *European Journal of Combinatorics*, *26*, p401-416, 2005

GRAZIER, K.R., NEWMAN, W.I., HYMAN, J.M., SHARP, P.W. 'Long simulations of the Solar System: Brouwer's Law and chaos', *ANZIAM J. electronic supplement*, *46*, p1086-1103, 2005

GRAZIER, K.R., NEWMAN, W.I., HYMAN, J.M., SHARP, P.W., GOLDSTEIN, D.J. 'Achieving Brouwer's Law with high-order Stϕrmer multistep methods', *ANZIAM J. electronic supplement*, *46*, pC786-C804, 2005

GREENWOOD, S.R., NYIKOS, P. 'Ω_1-compactness in type I manifolds', *Topology and its Applications*, *148*, *(13)*, p165-171, 2005

HUANG, S. 'Dade's invariant conjecture for the Chevalley groups of type G_2 in the defining characteristic'. *Journal of Algebra, 292*, 110-121, 2005.

LI, C.H., SIRÁN, J. 'Regular maps whose groups do not act faithfully on edges, vertices, or faces', *European Journal of Combinatorics*, *26*, p521-541, 2005

MCCABE-DANSTED, J.C., SLINKO, A.M. 'Exploratory Analysis of Similarities between Social Choice Rules', *Group Decision and Negotiation*, *online*, p1-31, 2005, DOI: 10.1007/s10726-005-9007-5

MILLER, M., SIRÁN, J. 'Moore graphs and beyond: A survey of the degree/diameter problem', *Electronic Journal Of Combinatorics*, *12*, p1-61, 2005, www.combinatorics.org

MOORS, W.B. 'Some more recent results concerning weak Asplund spaces'. *Abstr. Appl. Anal., 2005*, 307-318, 2005.

O'BRIEN, E.A., VAUGHAN-LEE, M.R. 'The groups of order p^7 for odd prime p', *Journal of Algebra*, *292*, *(1)*, p243-258, 2005

OATES, G., PATERSON, J.E., REILLY, I.L., STATHAM, M.A. 'Effective tutorial programmes in tertiary mathematics', *International Journal of Mathematical Education in Science and Technology*, *36*, *(7)*, p731-740, 2005

PAVLOV, B., ANTONIOU, I. 'Jump-start in analytic perturbation procedure for Friedrichs model', *Journal of Physics A-Mathematical and General*, *38*, *(22)*, p4811-4823, 2005

PAVLOV, B., KRUGLOV, V.I. 'Operator Extension technique for resonance scattering of neutrons by nuclei', *Hadronic Journal*, *28*, *(3)*, p259-268, 2005

PFANNKUCH, M. 'Characterizing Year 11 students' evaluation of a statistical process', *Statistics Education Research Journal*, *4*, *(2)*, p5-26, 2005, http://www.stat.auckland.ac.nz/serj

PFANNKUCH, M. 'Thinking tools and variation', *Statistics Education Research Journal*, *4*, *(1)*, p83-91, 2005, http://www.stat.auckland.ac.nz/serj

RICHTER, R.B., SIRÁN, J., JAJCAY, R., TUCKER, T.W., WATKINS, M.E. 'Cayley maps', *Journal of Combinatorial Theory Series B*, *92*, *(2)*, p189-245, 2005

SIAGIOVA, J., SIRÁN, J. 'A note on large Cayley graphs of diameter two and given degree', *Discrete Mathematics*, *305*, p379-382, 2005

SIMPSON, D., KIRK, V.J., SNEYD, J. 'Complex oscillations and waves of calcium in pancreatic acinar cells', *Physica D-Nonlinear Phenomena*, *200*, p303-324, 2005

SLINKO, A.M. 'How the Size of a Coalition Affects its Chances to Influence an Election', *Social Choice and Welfare*, *online*, p1-11, 2005, DOI: 10.1007/s00355-005-0052-4

SLINKO, A.M., SERTEL, M.R. 'Ranking committees, income streams or multisets', *Economic Theory*, *online*, p1-23, 2005, DOI 10.1007/s00199-005-0054-6

SNEYD, J., FALCKE, M. 'Models of the inositol trisphosphate receptor', *Progress in Biophysics and Molecular Biology*, *89*, p207-245, 2005

STEWART, S., THOMAS, M.O.J., HANNAH, J. 'Towards student instrumentation of computer-based algebra systems in university courses', *International Journal of Mathematical Education in Science and Technology*, *36*, *(7)*, p741-750, 2005

Tee, G.J., 'Surface area and capacity of ellipsoids in dimensions.' *NZ Journal of Mathematics, 34*,p165-198,2005.

THOMAS, M.O.J., HONG, Y.Y. 'Learning mathematics with CAS calculators: Integration and partnership issues.', *The Journal of Educational Research in Mathematics*, *15*, *(2)*, p215-232, 2005

VALE, R., WALDRON, S.F.D. 'Tight frames and their symmetries', *Constructive Approximation*, *21*, p83-112, 2005

YASHIRO, T. 'A note on Roseman Moves'. *Kobe J. Math., 22*, 31-38, 2005.

YASHIRO, T. 'Triple Point Numbers of Twist Spun Knots'. *Journal of Knot Theory and its Ramifications, Vol. 14, No. 7*, 831-840, 2005.

Journal - Review Article

TEE, G.J. 'Review of : Yakov Sinai (editor), Russian Mathematicians in the 20th Century', Review in *Newsletter of the New Zealand Mathematical Society*, *93*, p39-41, 2005

Working Paper

Intellectual Property

LIU, X., HERMAN, W., WANG, S. 'Integrated high efficiency blower apparatus for HVAC systems', USA, 00421071, 2005, 2003-08-08

Interview - Radio, TV, Other

CONDER, M.D.E., Interviewed on TV1 News about Chain letters, April 2005

LATU, V., Interviewed on Campbell Live on TV3, April 2005

SLINKO, A.M. 'MMP distorted election outcome', The Dominion Post, Wellington,, 2005-09-30

SLINKO, A.M. 'The Other Olympiad', Documentary NZ TVOne, 2005-11-04

SNEYD, J., Interviewed on Breakfast TV1 regarding his public lecture titled Mathematics may be the Queen, but Biology is her intimate friend", December 2005

Oral Presentation

(G) Professional and technical reports
NEVILLE-BARTON[3], P. & BARTON, B. 'The Relationship Between English Language and Mathematics Learning for Non-Native Speakers: A TLRI Research Report for NZCER'. Auckland, UNITEC New Zealand, 52 pages, 2004.

Mathematics Department Research Report Series
543: Baire spaces, Tychonoff Powers and the Vietoris topology , by Jiling Cao and A. H. Tomita
542: Discrete wave scattering on a star-graph , by S.Fedorov, B.Pavlov
541: Separate Continuity, Joint Continuity, the Lindelöf Property and p-spaces , by Warren B. Moors
540: Irregularity , by Szymon Dolecki and David Gauld
539: Surface Area of Ellipsoid Segment , by Garry J. Tee
538: Monotonicity of Some Functions in Calculus , by G.D. Anderson, M.K. Vamanamurthy and M. Vuorinen
537: Dirichlet-to Neumann techniques for the plazma-waves in a slot diod , by A. Mikhailova, B. Pavlov, V. Ryzhii
536: Fitting of the solvable model for scattering by Helmholtz resonator , by B. Pavlov
535: The product of a Baire space with a hereditarily Baire metric space is Baire , by Warren B. Moors
534: On Complexity of Lobbying in Multiple Referenda , by Robin Cristian, Mike Fellows, Frances Rosamond, Arkadii Slinko
533: Probabilistic Solutions to Merchant Problems: Locating of the False Stack , by Vladimir L. Oleinik and Boris S. Pavlov

(H) Refereed designs
(I) Patents
(J) Major original creative works
(K) Other works

BUTNARIU,D[3], CALVERT,B AND REICH,S[3], EDITORS. 'Special Issue on Nonlinear Analysis and Optimization'. *Conference Proceedings from VIC-2004 2005, JNCA, Vol.6, No.1*

OTHER MATTERS RELATED TO RESEARCH ACTIVITIES

(a) PhD Students

The following students completed their PhD degrees during the year.

Name	Thesis Topic/Title	Supervisor(s)
Nicoleen Cloete	Probability theory and Stochastic Processes with application in population genetics and phylogenetic (Biological Sciences) inference	Dr G. Nicholls & Assoc Prof D. Scott (Statistics)
Jianhua (Jeff) Gong	Geometry & Analysis	Prof. G. Martin & Assoc Prof N. Levenberg
Shirley Huang	Numerical Methods for ODEs	Prof. J. Butcher & Dr R. Chan
Edward Huang	Representations of Finite Groups	Assoc Prof J. An & Assoc Prof E. O'Brien
Nicolette Rattenbury	Numerical Analysis	Prof J. Butcher & Dr R. Chan
Barbara Miller-Reilly	Affective change in adult students returning to the study of mathematics	Dr K. Irwin (Education) & Dr C. Brown

Current PhD students

Name	Thesis Topic/Title	Supervisor(s)
Willy Alangui	Mathematics and Culture	Assoc Prof B. Barton
Renu Choudhary	Generic convergence of Lyapounov functions	Assoc Prof B. Calvert
Greg Ewing	Migration-genealogy coalescent processes	Dr G. Nicholls & Prof A. Rodrigo (SBS)
Alan De Los Santos	Representation in Calculus learning	Assoc Prof M. Thomas & Prof I. Reilly
David Godfrey	The Notion of Equality in Learning	Assoc Prof M. Thomas & Dr K. Irwin (Education)
Maria Goodier	ODE Methods for PDEs	Dr S. Taylor & Dr R. Chan
Gareth Hegarty	Modelling and Control of Nonlinear Beams	Dr S. Taylor
Erin Higgins	Modelling calcium transients in cardiac myocytes	Prof J. Sneyd
Barbara Kensington-Miller	Professional Development of mathematics teachers in low decile 2 schools	Assoc Prof B. Barton & Prof Stuart McNaughton (Education)
Alison Kohout	Wave Scattering in the Marginal Ice Zone, Antarctica	Dr M. Meylan
Nala Nataraj	The role of history in learning algebra	Assoc Prof M. Thomas & Dr A. Begg

Garry Nathan	Argumentation in Mathematics	Assoc Prof B. Barton & Assoc Prof M. Thomas
Greg Oates	Integrataion of technology in University Courses	Assoc Prof M. Thomas & Assoc Prof B. Barton
Judith Paterson	Participation in professional development & its influence on pedagogical change for mathematics teachers	Assoc Prof B. Barton
Debasish Roy	Markov chain Monte Carlo algorithms, Bayesian Inference, Inverse problems	Dr C. Fox and Dr G. Nicholls
Joseph Silhan	Generic convergence of Lyapounov functions	Dr R. Gover
Sepideh Stewart	Conceptual understanding of linear algebra	Assoc Prof M. Thomas & Prof. I. Reilly
Angela Tsai	Applied Mathematics – Numerical Analysis	Prof. J. Butcher & Dr R.Chan
Chung-Ju (Jeff) Tsai	A generalisation on Joerg's inequality	Dr A. Gover & Prof. G. Martin
David Welch	Stochastic models of population dynamics	Dr G. Nicholls, Prof. A. Rodrigo (Biology) & Dr W. Solomon

Diploma, Honours and Masters Students

Name	Thesis Topic/Title	Supervisor(s)
Robyn Agnew	Mathematics learner identities	Dr H Bartholomew
Farida Ahmadzai	Numerical computation of swirling flows in curved pipe	Dr S Wang
Ku Azlina Ku Akil	Stability analysis of swirling flow	Dr S Wang
Matthew Auger	Torsion-free subgroups in 4-dimensional Coxeter groups	Prof M Conder
Tara Bonda	Fuchsian groups	Prof M Conder
Tara Bonda	Aspects of finitely-presented groups	Assoc Prof E O'Brien
Michael Brough	Summer Scholarship	Prof D Gauld
Margaret Bryant	Technology in the classroom	Assoc Prof M Thomas
Kok Theng Chan	A non-existence proof for a conformally invariant 6th order laplacian type operator	Assoc Prof A Gover
Robin Christian	5-connected graphs	Assoc Prof P Bonnington
Robin Christian	Algebraic graph theory project	Assoc Prof J Sirán
Robin Christian	2 research papers	Dr A Slinko
John McCabe Dansted	thesis	Dr A Slinko
John McCabe Dansted	research paper	Dr A Slinko
LIsa Darragh	peer learning choices	Dr H Bartholomew
LIsa Darragh	reflections on maths 255	Dr H Bartholomew
Gillian Frankcom	Maths Anxiety of Trainee Teachers	Assoc Prof m Thomas, Gregor Lomas (Educ)
Jason Fu	Generating sets for finite groups	Prof M Conder
Elan Gin	Calcium Buffering	Dr V Kirk , Prof J Sneyd
Mads Haar	Vortex breakdown	Dr S Wang

Christopher Hay	Norm separability of sets that are separable with respect to the topology	Dr W Moors
Viliami Latu	Tongan mathematics register	Dr H Bartholomew
Paul Leys	The numerical solution of Turing systems	Dr P Sharp, Prof B Pavlov
Jiamou Liu	Ramsey Theory (reading course)	Assoc Prof J Sirán
Yicheng Liu	NZ Steel radiation furnace: Temperature measurement	Dr S Wang
Eyal Loz	Algebraic graph theory (reading course)	Assoc Prof J Sirán
Jing Ma	Stochastic Models	Dr S Taylor
Jing Ma	New approach to stability of swirling flow	Dr S Wang
Johanna McHardy	Technology in the classroom	Assoc Prof M Thomas
Simon Marshall	differential geometry	Assoc Prof A Gover
Simon Marshall	2 research papers	Dr A Slinko
Stephen Merriman	Summer Scholarship Project	Assoc Prof J Sirán
Peter Nelson	Summer Scholarship Project	Assoc Prof J Sirán
Vithya Shanamangathan	The phase in simulations of the outer Solar System	Dr P Sharp
Maree Shaw	Mathematical Techniques in Neuroscience	C King
Elizabeth Sneddon	collaborative tutorials in engineering maths	Dr H Bartholomew
Dror Speiser	Some open problems in group theory	Assoc Prof J An
Robert Stafford	submanifolds in conformal geometry	Assoc Prof A Gover
Cynthia Sundram	A Case Study of the Effects of Tutoring on the Tutor's Mathematics	G Oates
Joanne Woodward		Assoc Prof M Thomas
Bin Yang	Group and Representations	Assoc Prof J An
Simon Young	Numerical experiments with a treecode	Dr P Sharp
Lup Chi Jonathan Yu	Forest harvesting with mature patches	Dr A McNaughton
Tian Zhang	Recognising alternating and symmetric groups	Assoc Prof J O'Brien
Tian Zhang	Matrix group algorithms	Assoc Prof J O'Brien

(b) Research Fellows

Dr Jiling Cao
Dr HyuckChung
Dr Laura Ciobanu
Dr Richard Evans
Dr Mark Harmer
Dr Ye Yoon Hong
Dr Edward (Shih-chang) Huang
Dr Abdul Mohamad
Dr Bart Oldeman
Dr CarolinePoisard
Dr Primoz Potocnik
Dr Jana Siagiova

Research Visitors

Research Visitors	Affiliation
Henrik Baarnhielm	University of London Ville Kolehmainen University of Kuopio, Finland
John Benedetto	University of Maryland
Marcelo Borba	University of Rio Claro, Brazil
Prof Len Bos	University of Calgary
Prof. Sydney Bulman-Fleming	Wilfrid Laurier University, Waterloo, Canada
Andreas Cap	University of Vienna
Pete Casazza	University of Missouri-Columbia
Benoit de Castelet	University of Nantes Damian Brossard University of Nantes
Professor John H. Conway	Princeton University
Dr John Crisp	Université de Bourgogne, France
Heiko Dietrich	Braunschweig
Xuan Duong	Macquarie University Sydney
Prof Michael Eastwood	University of Adelaide
Professor Bettina Eick	Braunschweig
Professor Peter Gill	ANU
Professor Paul Gartside	University of Pittsburgh
Professor Derek Holt	Warwick
Dr. Patrick D. F. Ion	Mathematical Reviews (Ann Arbor, Michigan)
Professor Andrei Jaikin	Universidad Autonoma de Madrid
Professor George Havas	University of Queensland
Prof. Heikki J. K. Junnila	University of Helsinki, Finland
Dr Frank Himstedt	Munich University of Technology
Prof. Jari Kaipio	Department of Applied Physics, University of Kuopio, Finland
Professor Bill Kantor	University of Oregon (Eugene)
Dr Ville Kolehmainen	Department of Applied Physics, University of Kuopio
Prof. Wolfgang Knapp	Universität Tübingen, Germany
Kate Lee	Queensland University of Technology
Seng Luan Lee	National University of Singapore
Professor Charles Leedham-Green	Queen Mary, University of London
Professor Martin Liebeck	Imperial College
David Levin	Tel Aviv University
Dr Martin Macaj	Comenius University

Prof John Mason	Open University
Dr Aisling McCluskey	National University of Ireland, Galway
Professor Chuck Miller	University of Melbourne
Prof. David Witte Morris	University of Lethbridge (Alberta)
Prof. Joy Morris	University of Lethbridge (Alberta)
Paul-Andi Nagy	Humboldt University of Berlin
Dr Roman Nedela	Slovak Academy of Sciences
Professor Mike F. Newman	Australian National University
Richard Porter	Bristol University, UK
Professor Cheryl Praeger	University of Western Australia
Professor C.K. Raju	Centre for Studies in Civilizations, New Delhi, India & Centre for Computer Science, MCRP University Bhopal, India
Nico Schloemer	Dresden University, Germany
Prof. Peter Schmid	Universität Tübingen, Germany
Professor Akos Seress	Ohio State University
Prof Dmitri Shakhmatov	Ehime Unviersity, Japan
Prof Jan Slovak	Masaryk University
M. Snuverink	University of Twente
Prof David Tall	Warwick University, UK
Lennaert van Veen	Latrobe University
Prof. Artur H. Tomita	University of Sao Paulo, Brazil
Vilmos Totik	Universities of South Florida and Szeged
Richard Vale	University of Glasgow
Prof Andrew Waldron	U.C. Davis
Dr Anne Watson	Oxford University
Daniel Watzenig	Graz University of Technology
Professor Wolfgang Willems	University of Magdeburg
Tim Williams	Otago University
Prof. Mariusz Wodzicki	University of California, Berkeley

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

Anthony D. Blaom	The Ghost of Symmetry in a Curved World
Martin Bridson (Imperial College, London)	Balanced presentations of groups and problems of Andrews-Curtis and Grothendieck.
Martin Bridson (Imperial College, London)	Curvature and decidability in geometry and group theory
Dr. David Bryant	Continuous and (mostly) tractable models for the

	variation of evolutionary rates
Prof John Butcher	General linear methods
Dr Jiling Cao	Stratifiable Volterra spaces are Baire
Andreas Cap (University of Vienna)	Infinitesimal automorphisms and deformations of parabolic geometries
David Choquenot (Landcare Research)	Mathematical models and wildlife population dynamics.
David Choquenot (Landcare Research)	Mathematical models and wildlife population dynamics
Renu Choudhary	Some topics from the theory of monotone operators and nonlinear semigroups
Renu Choudhary	Generic Convergence of a Convex Lyapounov Function Along Trajectories of Nonexpansive Semigroups in Hilbert Space.
Robin Christian	On Computational Complexity of Lobbying in Multiple Referenda
Dr. Hyuck Chung	Modelling timber based floor structures
Dr Laura Ciobanu	Fixed subgroups in free groups
Dr Mark Clements (National Centre for Epidemiology & Population Health)	Small area analysis of cancer rates
Professor John H. Conway (Princeton University)	Hunting the Monster with few weapons
Professor John H. Conway (Princeton University)	The Free Will Theorem
Heiko Dietrich (Braunschweig)	Groups of cube-free order
Dr Richard Evans	Grafting hyperbolic 3-manifolds
Steven Galbraith (Royal Holloway University of London)	Applications of elliptic curves in cryptography
Prof Paul Gartside (University of Pittsburgh)	The Circular Squares are Wild
Prof Paul Gartside (University of Pittsburgh)	The Shape of Space
Garth Gaudry and Jan Thomas (Australian Mathematical Sciences Institute)	The AMSI and the International Centre of Excellence for Education in Mathematics
David Gauld	Topological manifolds, games and function spaces
David Gauld	MOPping up
Peter M.W. Gill (Australian National University)	Efficient calculation of p values in permutation significance tests
Peter Gill (Australian National University)	Introduction to quantum chemistry
Professor Peter Gill (Research School of Chemistry, Australian National University)	Hartree-Fock-Wigner models for quantum chemistry
Dr Sina Greenwood	Characterising continuous functions on connected compact spaces
Christopher Hay	Metrizability of compact convex sets under certain criteria on the
Adrian Hill (University of Bath)	Applications of Control Theory to Numerical Stability
Dr Frank Himstedt (TU, Munich)	Low-dimensional representations of Steinberg's triality groups
Professor Derek Holt (University of Warwick)	Groups with regular sets of geodesics
Professor Derek Holt (University of Warwick)	Formal Language Theory and the Word Problem in groups
Jens Hornsgaard	Sequences
Dr Beatrix Jones (Institute of Information & Mathematical Sciences,Massey University,	Fitting and interpreting sparse Gaussian graphical models for high dimensional data

Albany Campus)	
Assoc. Professor Bradford S. Jones (Department of Political Science, University of Arizona)	"Timing and Social Change: An Introduction to Event History Analysis"
Prof Heikki Junnila (University of Helsinki)	Hereditarily sigma-metacompact function spaces
Professor Bill Kantor (University of Oregon)	Algorithms for Sylow subgroups
Assoc Prof Vojislav Kecman (School of Engineering)	Learning From Huge Data Sets by SVMs
Robert King (University Of Newcastle)	Investigating Response Times using the Generalised Lambda Distribution
Professor Winfried Kohnen (Heidelberg)	On infinite product expansions of modular functions
Professor Wolfgang Knapp (Universitaet Tuebingen)	Primality testing with the group SL(2,Z/nZ)
Peter Kuchment (Texas A & M University)	Liouville theorems and spectral edge behaviour for periodic operators
S.N. Lahiri (Iowa State University)	On the blocking mechanism for bootstrapping spatial data under a class of stochastic designs
Dr. Carlo Laing (Massey University (Albany))	Equation-free modelling: some neural examples
Dr. Emily Lane (UCLA, USA)	Wave-Current Interactions and Shore-Connected Bars
Professor Alan Lee	Case-Control, Efficiency and Semi-parametric Regression
Angelika van der Linde (University of Bremen, Germany)	General measures of variability and dependence for multivariate continuous distributions
Professor Liptser (Tel Aviv University)	Simple branching model. Likely path to extinction. LDP approach
Catherine Loader (Department of Statistics, Case Western Reserve University)	Statistical Inference and Tubular Neighborhoods
Eyal Loz	Lifts of graphs in the search for cages and degree diameter problems
Aisling McCluskey (National University of Ireland, Galway)	Representing posets in P(R)
Dr David McIntyre	Topology Dictionary and Topology Oracle
Professor Chuck Miller (University of Melbourne)	Reflections on some groups of B. H. Neumann
Dr Warren Moors	Separate Continuity, Joint Continuity and the Lindelof Property
Paul-Andi Nagy (Humboldt University of Berlin)	Nearly-Kaehler manifolds
Professor Roman Nedela (Slovak Academy of Sciences)	Enumeration of maps and hypermaps with given genus and given number of edges
Richard Porter (University of Bristol)	Wave scattering by an ice sheet of varying thickness
Primoz Potocnik	Tetravalent edge-transitive graphs and related topics
Professor Cheryl Praeger (University of Western Australia)	Homogeneous factorisations of graphs
Professor Cheryl Praeger (University of Western Australia)	Groups, probability, algorithms: computing with `giants'
Dr Sasa Radomirovic (Rutgers University)	Cusp forms over function fields and Modular Symbols
Professor C. K. Raju (Ctr for Studies in Civilizations, New Delhi& Ctr for CS, MCRP Uni.,Bhopal, India)	Series Expansions and the Computation of in India from Aryabhatta to Yuktideepika
Prof C. K. Raju (Ctr for Studies in Civilizations, New Delhi & Ctr for CS, MCRP Uni.Bhopal, India)	Lessons for Mathematics Education.
C.R. Rao (Pennsylvania State University, USA)	Statistics: Reflections on the past and visions for the future
Prof Dmitri Shakhmatov (Ehime University, Japan)	Constructing Hausdorff topologies on Abelian groups, part I
Prof Dmitri Shakhmatov (Ehime University,	Constructing Hausdorff topologies on Abelian

Japan)	groups, part II
Jana Siagiova	Applications of coverings in Cayley maps and in the degree-diameter problem
Prof Jan Slovak (Masaryk University)	Generalized planar curves and quaternionic geometry
Michael Stuart (Trinity College, Dublin)	Mathematical thinking versus statistical thinking; redressing the balance in statistical teaching
Brajendra Sutradhar (Memorial University of Newfoundland, Canada)	Penalized versus Generalized Quasi-likelihood Inference in GLMM
Brajendra Sutradhar (Memorial University of Newfoundland, Canada)	Familial Longitudinal Data Analysis with Biomedical Applications
Dr. Matt Tearle (University of Colorado in Boulder)	Generalized Linear Stability Analysis of Stratified Shear Flow
Dr Garry J. Tee	Permutable polynomials and rational functions
Prof. Artur H. Tomita (University of Sao Paulo (Brazil))	Countably compact groups
Lennaert van Veen (Latrobe University)	A high codimension bifurcation at the root of complex brain dynamics.
Daniel Watzenig (Graz University of Technology)	Electrical Capacitance Tomography at Graz University of Technology: State-space representations and particle filtering
Professor Wolfgang Willems (University of Magdeburg)	Some open problems in modular representation theory
Professor Wolfgang Willems (University of Magdeburg)	Are cyclic codes asymptotically good?
Professor Wolfgang Willems (University of Magdeburg)	A survey of problems and methods in coding theory
Tim Williams (University of Otago)	The scattering of ice-coupled flexural-gravity waves by a ramp or a double step
Prof Mariusz Wodzicki (University of California, Berkeley)	Algebra of Differential Operators
Prof. Mariusz Wodzicki (University of California, Berkeley)	Exotic Traces
Dr Tsukasa Yashiro	Diagrammatic approaches to surface-knots - 1-handles and triple points.

Research Grants

MARSDEN GRANTS

Grantee	**Amount**	**Title**
A/P P Bonnington, A/P J Sirán (PIs) and Prof M Conder (AI)	110000	Algebraic and Structural Graph Theory
Dr H Chung, Dr C Fox	206000	Improving sound insulation in multi-dwelling timber buildings
Prof Marston Conder , A/P J An and A/P E O`Brien	169533	Group actions representations, structure and algorithms
Prof David Gauld (PI), Satya Deo (Allahabad) (AI)	390000	Dynamics on non-metrisable surfaces and manifolds
Dr M Meylan	30000	Wave Scattering in the Marginal Ice Zone
Dr S Huang, A/P E O'Brien	181111	Resolution of Uno's conjecture for families of simple groups

OTHER EXTERNAL GRANTS

Grantee	Amount	Title	Funding Body
A/P B Barton	5000	Indigenous Mathematics Teachers	Royal Society of New Zealand (ISAT)
Dr C Fox	3520	Meshing, multigrid and MCMC	Royal Society of New Zealand
Prof D Gauld, Vaughan Jones and Roger Fenn (Sussex),	398000	Geometric Methods in the Topology of 3-Dimensional Manifolds	NZIMA
A/P A.R. Gover, T. Branson (Univ Iowa)	2600	Conformal geometry: Spectral and nonlocal aspects	RIMS, Banff International Research station (Canada)
A/P A.R. Gover	4000	non-linear PDE	Mathematical Sciences Research Institute, Berkeley
Dr W Moors, Dr J Cao	250000	Analytic topology and its applications	Royal Society of New Zealand
Prof B Pavlov	4444	Transport properties and mathematical modelling of quantum networks	Royal Society of New Zealand (ISAT)
Dr P Sharp	3000	Numerical methods for N-body simulations	Royal Society of New Zealand (ISAT) - awarded late 2004, used 2005
Dr P Sharp	2667	The early solar system	Royal Society of New Zealand
A/P J Sirán	4000	Maps and orbifolds	Royal Society of New Zealand
Dr A Slinko	3000	Ranking multisets and learning in games	Royal Society of New Zealand (ISAT)
Dr A Slinko , Bill Schworm (Sydney)	4000	Uncertainty and Polarisation	Economic Design Network
Prof J Sneyd	22062	Modeling the contraction of airway smooth muscle	University of Massachusetts Medical Center
Prof J Sneyd	542222	Modeling the cardiac calcium transient on multiple spatial scales	Royal Society of New Zealand
A/P MOJ Thomas	140780	The impact of technology use on the teaching and learning of mathematics in the secondary classroom	Ministry of Education - Teaching & Learning Research Initiative - NZARE

UNIVERSITY OF AUCKLAND STAFF RESEARCH GRANTS

Grantee	Amount	Title
A/P B Barton, B Kensington-Miller	3500	Mentoring mathematics teachers of senior students in low socio-economic areas
A/P B Calvert	4500	Study of Lazzaro's WTA network
A/P B Calvert, R Choudhary	2000	Generic convergence of a convex lyapounov function along trajectories of nonexpansive semigroups
Prof M Conder	20000	Hood Fellowship
A/P A R Gover	110000	Geometric invariants for conformal and related structures - computational aspects
A/P A R Gover	49100	Invariants, special structures, and their applications in physics and analysis
Dr S Greenwood	6500	Generalising fixed point theoerems

Dr S Greenwood	4000	Charaterising continuous functions
Dr S Greenwood, Dr H Bartholomew, Colleen McMurchy Pilkington	3472	Pangarau: Achieving in Mathematics
Dr V Kirk	7396	Heteroclinic and homoclinic phenomena
Dr M Meylan	6824	Wave scattering by infinite and semi-infinite arrays
Prof B Pavlov	3000	Scattering by resonance obstacles
Dr P Sharp	4250	A multipole störmer's method for a self-gravitating disk model of the early solar system
A/P J Sirán	12000	Symmetries of maps and fractal tessellations
Dr A Slinko	2700	Invitation of Prof Bossert
Prof J Sneyd, Dr C Fox	9000	Modeling the contraction of airway smooth muscle
Dr S Taylor	2300	Quantum Chemistry
Dr S Taylor, Peter Boyd (Chem)	3000	Peter Gill Distinguished Visitor Award
A/P MOJ Thomas, M Corballis	TO UNISERVICES	The neuropsychological basis of mathematical thinking
A/P MOJ Thomas	3000	Prague International PME conference
A/P MOJ Thomas	20500	fMRI scans and maths learning
Dr S Wang	8500	Stability of swirling flow and vortex breakdown phenomenon

VI. STAFF LEAVE AND CONFERENCES

Name	Conference Name	Papers Delivered
Dr H Bartholomew	ICMI Study - mathematics teacher development	Maths teacher development in low socio-economic areas
Dr H Bartholomew	Maths Education and Society	Dodging the dragon: stategies for mathematics professional development in low socio-economic areas
Dr H Bartholomew	Maths Education and Society	Top set identities and the marginalisation of girls
Assoc Prof P Bonnington	30 ACCMCC, University of Queensland	Induced non-separating cycles in 4-connected graphs
Assoc Prof P	GEMS 2005, High Tatras, Slovakia, Jul 2005	Induced non-separating cycles in 4-connected graphs
Assoc Prof B Calvert	NACA 2005	Multiterminal resistors and monotonicity
Dr J Cao	Miniconference on functional analysis,Perth, Australia, 25-27 September, 2005	Baire spaces and Vietoris topology
Prof M Conder	2005 NZ Mathematics Colloquium (Palmerston North, December 2005)	Highly transitive imprimitivities
Prof M Conder	Pacific Rim Mathematical Forum (BIRS, Banff, Canada, October 2005)	The NZ Institute of Mathematics & its Applications
Prof M Conder	GEMS05 Conference on graph embeddings (Stara Lesna, Slovakia, June 2005)	Chiral regular maps and related matters
Prof M Conder	Joint meeting of American,	Highly transitive imprimitivities

	Austrian & German Math Societies (Mainz, June 2005)	
Prof M Conder	Graph Theory with Altitude (Denver, Colorado, May 2005)	Symmetries of Cayley graphs and graphs underlying regular maps
Prof M Conder	NZIMA Conference on Geometry and Algebra (Auckland, February 2005) NZMRI summer meeting on Geometry (Napier, January)	Hyperbolic 4-manifolds of small volume
Prof D Gauld	NZMRI Summer Workshop Devonport Topology Festival	Report on the Oman games
Prof D Gauld	Ninth Galway Topology Colloquium	Metrisability of manifolds
Prof D Gauld	Ninth Galway Topology Colloquium	Dynamics of non-metrisable manifolds
Prof D Gauld	NZ Mathematics Colloquium	Games and metrisability of manifolds
Assoc Prof A Gover	International Workshop in Conformal invariants-geometric and analysis aspects, The National Center for Theoretical Sciences (CTS), Taiwan, Jun 6--14, *2005*	De Rham detour complexes, things like Q-curvature and global conformal invariant
Assoc Prof A Gover	Plenary presentation at: Seventh International Conference on Clifford Algebras: ICCA7, Toulouse, France, 19-29 May, *2005*	De Rham detour complexes, things like Q-curvature and global conformal invariants
Assoc Prof A Gover	Invited talk at the workshop: Recent Results in Nonlinear Elliptic Equations and their Interactions with Geometry, Mathematical Sciences Research Institute, Berkeley, California, Oct. 31-Nov. 4, *2005*	Conformal Laplacian operators and Q-curvature on Einstein manifolds
Assoc Prof A Gover	Workshop on Parabolic Geometry, University of New South Wales, 23--25 Feb., *2005*	Cartan connections II
Assoc Prof A Gover	Workshop on parabolic geometry, University of New South wales, 23-25 Feb., *2005*	Cartan connections I
Assoc Prof A Gover	NZ Mathematics Colloquium,, Massey University, Palmerston North, 5--7 Dec., *2005*	Conformal Laplacian operators and Q-curvatures on Einstein manifolds
Assoc Prof A Gover	Geometry: Interactions with Algebra and Analysis, University of Auckland, Feb. 14 --18, *2005*	Operators on differential forms and global invariants of smooth manifolds
Dr S Greenwood	Devonport Topology Festival Workshop on Coverings, Selections and Games in Topology	"80% full, 20% empty": Teaching the "empty" the case of the Pacific Student?
Dr P Hafner	IWONT 2005 (International Workshop MMS graphs On Network Topologies, Ballarat), invited plenary speaker	
Dr A Heard	NZ Mathematics Colloquium, Palmerston North, New Zealand, 5-7 December 2005, 2005	Approximate Computational Processes for General Linear Methods
Dr A Heard	SciCADE (Scientific Computation & Differential Equations) Nagoya, Japan, 23-	Approximate Computational Processes for General Linear Methods

	27 May 2005, 2005	
C. King	Second Symposium in Non-Linear Science Shanghai Jun 05	The Conscious Interface in Space-time:_Non-linearity, entanglement and evolution
Dr V Kirk	SIAM meeting on Applied Dynamical Systems, Utah, May 2005	
Dr V Kirk	NZMS Colloquium, Dec 2005	
Dr V Kirk	NZIMA meeting on Dynamical Systems and Numerical Analysis, July 2005	
H. McKenzie	ALM Melbourne June/July	Hands, feet and other body parts. Co- presented with Moira Statham and Sheena Parnell.
H. McKenzie	MERGA June/July Melbourne Delta November Fraser Island	
Dr A McNaughton	IFORS	The area restricted forest harvesting problem
Dr A McNaughton	ORSNZ	Forest Harvesting with Wildlife Corridors
Dr M Meylan	International Workshop on Water Waves and Floating Bodies	Wave Scattering in a Rivetted Plate
Assoc Prof E O'Brien	"ALOCOMA 05", Bayreuth, April 2005.	Construction and classification of groups
Assoc Prof E O'Brien	Group theory and algebraic geometry, University of Warwick, August 2005.	Algorithms for large degree matrix groups
Assoc Prof E O'Brien	NZMS Invited lecture: NZ Colloquium, Palmerston North, December 2005	Towards effective algorithms for linear groups
Assoc Prof E O'Brien	Miniconference, Australian National University, August 2005.	An investigation of an infinite family of linear groups
G Oates	Delta '05 Undergraduate Mathematics Symposium	Effective Tutorial Programmes in tertiary mathematics
S Parnell	28th Annual Conference of the MERGA, Melbourne, July 2005	
S Parnell	Adults Learning Mathematics, Melbourne, July 2005	Hands Feet and other Body Parts - workshop
S Parnell	Kingfisher DELTA'05, Frazer Island, Queensland, Australia, November 2005	Do Student reflections increase undergraduate learning?
J Paterson	Fifth Southern Hemisphere Conference on Undergraduate Mathematics and Statistics	Using Mathematics to open up windows in teachers' minds: Encouraging teacher talk about learning and teaching.
Dr P Sharp	Divisional of Dynamical Astronomy, American Astronomical Society	The case for Nystrom methods
Assoc Prof J Sirán	Graph Embeddings and Maps on Surfaces (GEMS), June 2005	A survey on regular maps
Assoc Prof J Sirán	Workshop in Group Theory, UoA, Nov. 2005International Workshop on Optimal Network Topology	Regular maps on a given surface THE Graph
Dr A Slinko	25th Australasian Economic Theory Workshop (Auckland, 23-24 February, 2005)	Relative Uncertainty Aversion and Additively Representable Set Rankings
Dr A Slinko	Logic, Game Theory and Social Choice, 4	On Complexity of Lobbying in Multiple Referenda
Dr A Slinko	The 4th International Symposium on Imprecise	Answers to Two Questions of Fishburn on Subset

	Probabilities and Their Application	Comparisons in Comparative Probability Orderings
Dr A Slinko	2nd Pan-Pacific Conference on Game Theory	Self-Selective Social Choice Functions
Dr J Sneddon	Kingfisher DELTA '05	EAL undergraduates learning mathematics
Dr J Sneddon	ACCMCC30 (Brisbane)	Modifying Minors for Clustered Planarity
Dr J Sneddon	ALM (Adults Learning Mathematics) Merga 28, Melbourne, July 2005	Hands, Feet and Other Body Parts (workshop)
M Statham	Merga 28, Melbourne, July 2005 Kingfisher Delta 05, Fraser Island, November 2005	Effective Tutorial Programmes in Tertiary Mathematics
Dr S Taylor	AMS-IMS-SIAM Summer Research Conference on Control Methods in PDE-Dynamical systems, Snowbird, Utah, USA, July 3-7, 2005	Boundary Feedback Stabilization of Nonlinear Beam Models
Dr S Taylor	ANZIAM 2005, Napier, NZ, February, 2005	Mathematical Modelling of an Annealing Furnace
Dr G Tee	Geometry: Interactions with Algebra and Analysis, University of Auckland, 14 -18 February, 2005	Surface area and capacity of n-dimensional ellipsoids
Dr G Tee	NZ Mathematics Colloquium, Massey University, Palmerston North, 5-7 December, 2005	Surface area and surface integrals over ellipsoid segments
Dr G Tee	2005 Albany-Auckland-Waikato Applied Mathematics Day, University of Auckland, September 9, 2005	Surface integrals over ellipsoid segments
Assoc Prof M Thomas	PME 2005, Melbourne, July	Teacher Factors in Integration of Graphic Calculators Into Mathematics Learning
Dr S Wang	Anzam annual conference	Stability of swirling flow and vortex breakdown phenomenon
Dr S Wang	MISG 2005	
Dr S Wang	ANZIAM2005, Napier, New Zealand, Jan 30-February 3, 2005	Instability arising in swirling flow
Dr S Wang	NZ Mathematics Research Institute 2005 Summer Workshop	
Dr S Wang	ANZIAM Mathematics-in-Industry Study Group 2005	

VII. COMMUNITY SERVICES

Public Lectures: The inaugural lecture in a series of Mathematics Public Lectures was given by Prof John Conway (Princeton University) in January 2005. This lecture on "The Free Will Theorem" was attended by three hundred people. The second in this series of Mathematics Public Lectures was held on 2 June. This was a well-attended (despite the weather) presentation by Dr Paul Gartside on “The Texture of the Universe”. In December the third and final lecture for the year titled “Mathematics may be the Queen, but Biology is her intimate friend” was given by Prof James Sneyd.

Hannah Bartholomew: Organised a mathematics day for teachers, where a number of speakers gave talks relating to a mathematical topic. Presented (with Bill Barton) a session on the MEP at a numeracy workshop in February, attended by teachers and others involved in the numeracy project.

Robert Chan: Principal organizer of the “Mathematics Day for Teachers” held in November at Tamaki Campus and sponsored by the Auckland Mathematics Association. This extremely successful day attracted about 100 teachers to a variety of presentations on Calculus, many given by Department members.

Marston Conder: Member of Performance-based Research Funding (PBRF) Advisory Group Member of Marsden Fund Council and Convenor of its Mathematical &Information Sciences Panel Member of Grafton Hall Board

Sina Greenwood: As part of the research project Pangarau: AIM, provided resources to Northland Maori high school students designed to support mathematics learning and motivation to continue in mathematics. Gave a talk to teachers during a one day workshop at the UoA.

Chris King: Hosted international discussion groups on chaos and consciousness, genetic technology, human impacts on biodiversity and climate and social consequences of issues raised in "Sexual Paradox: Complementarity, Reproductive Conflict and Human Emergence"

Eamonn O'Brien: Member of Editorial Board, J of Algebra (Computational Algebra), Editor (joint with Derek Holt, Warwick) for special issue of J. Algebra to appear June 2006, Member of Editorial Board, J of the Australian Mathematical Society (Group Theory and Computational Algebra). Regular referee for various journals, regular reviewer for Mathematical Reviews, and grant assessor for a number of international funding agencies.

Greg Oates: Assisted with Mathematics Olympiad Auckland Region Competition

Sheena Parnell: Writing National Scholarship examinations for NZQA. Marking National Scholarship examinations for NZQA. Training Scholarship facilitators for the Ministry. Standards setting for National Scholarship examinations for the Ministry/NZQA. Moderate MIT mathematics examinations. Presenting Mathematics teacher workshops.

Paterson Judy: Spent 10 days providing professional development to a group of South African mathematics teachers with colleagues from Britain, Denmark, Australia and the USA in a project organised by AIMSSEC in Stellenbosch University, South Africa.

Judy Paterson: Visited student teachers on placement in schools and had the opportunity to interact with many members of the school community. Worked with the Mathematics Enhancement Project to provide professional development of the teachers of senior mathematics classes in very low decile schools in the Manukau region.

Philip Sharp: Gave a two-hour lecture on the Earth's atmosphere. This was done under the auspices of the UoA Centre for Continuing Education (CCE). Gave two lectures at the FoS Incredible Science Day. Over 500 children and adults attended the talks. Gave an evening course of five two-hour lectures on the Solar System. This was done through the CCE.

Arkadii Slinko: Training Director of NZMOC and Leader of NZ Team to the International Mathematics Olympiad 2005. New Zealand Asia-Pacific Math Olympiad Representative. Problem Selection Committee of Auckland Mathemtical Olympiad.

Garry Tee: Public Lecture sponsored by The N Z Institute of Physics and the N Z Mathematical Society, University of Auckland titled 'Sir William Rowan Hamilton 1805-1865'.

VIII. OTHER MATTERS

This is the section in which any initiatives that the Department may have taken to improve and monitor the quality of its work might be included.

Staffing

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

Dr Paul Bonnington	to Associate Professor
Ms Sheena Parnell	to Senior Tutor over the bar

Awards

Prof James Sneyd	NZ Mathematical Society Research Award; Elected as a Fellow of the Royal Society of New Zealand

Mr Greg Oates	Best paper award at Asian Technology in Mathematics Conference in Singapore (December 2004)
Prof Marston Conder	Hood Fellowship (December 2004).
Prof Marston Conder	Honorary Life Member of NZ Mathematical Society (December 2004).
Prof Boris Pavlov	Elected as a Fellow of the Royal Society of New Zealand

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, Prof. James Sneyd, Assoc. Prof. Eamonn O'Brien,
Departmental Committee	Mr David Alcorn, Assoc Prof Bill Barton, Prof. Marston Conder, Prof David Gauld, Dr Rod Gover, Dr Paul Hafner, Dr Vivien Kirk, Ms Daniela Rovere
Department Staffing Advisory Committee	Assoc Prof Bill Barton, Prof. David Gauld, 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, Assoc Prof Mike Thomas, Dr Shayne Waldron
Computer Committee	Dr Paul Bonnington, Dr David McIntyre, Assoc Prof Eamonn O'Brien, Dr Philip Sharp, Assoc Prof 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. David Gauld Prof. Boris Pavlov, Prof. Ivan Reilly, Prof. James Sneyd
Head of Applied Mathematics Unit	Prof. James Sneyd, Dr Vivien Kirk
Head of Mathematics Education Unit	Assoc Prof Mike Thomas
Head of Tamaki Mathematics Group	Dr Robert Chan
Directors of Graduate Studies PhD	Dr Sina Greenwood, Dr Mike Meylan
Director of Graduate Studies Masters and Postgraduate Diploma	Dr Philip Sharp
Teaching Coordinator	Dr Paul Hafner
Research Coordinator	Prof. Marston Conder
BTech (Industrial Mathematics) Coordinator	Dr Steve Taylor
Enrolment Coordinator	Mr David Alcorn, Dr Jamie Sneddon
Timetable Administrator	Mr David Alcorn, Dr Jamie Sneddon
Examination Coordinator	Mr David Alcorn, Dr Jamie Sneddon,

Examinations Results Processing	Dr David McIntyre, Dr Jamie Sneddon, Mr Nic Brown
Publicity Officer	Mr Chris King
Regulations/Handbooks	Dr David Smith, Ms Patricia Rood
EEO/EEdO Representative	Dr Sina Greenwood, Ms Daniela Rovere
NZ Mathematical Society Correspondent	Dr Garry Tee
Webmaster	Dr Shayne Waldron, Ms Daniela Rovere
Overseas Students & Ad Eundum Admissions	Mr David Alcorn, Dr Philip Sharp
Library Liaison Officer	Mr David Alcorn, Dr Bruce Calvert
Convenor of Staff/Student Liaison Committee	Mr Greg Oates
Summer Research Scholarships Coordinator	Dr Vivien Kirk, Assoc Prof Josef Sirán
Organiser of the Undergraduate Laboratories	Dr Allison Heard
Markers Coordinator	Mr Roy Swenson
Markers Coordinator (Tamaki)	Dr Alastair McNaughton
Department Research Report Series	Ms Olita Moala
Safety Officer	Ms Daniela Rovere
Seminars:	
Algebra, Geometry & Combinatorics	Assoc Prof Eamonn O'Brien
Analysis	Dr Shayne Waldron
Applied, Computational & Industrial Mathematics	Dr Philip Sharp
Topology	Dr Sina Greenwood
Department Colloquia	Assoc Prof Eamonn O'Brien
MESS (Mathematics Education)	Dr Hannah Bartholomew, Ms Barbara Miller-Reilly
GRID (Mathematics Education)	Dr Maxine Pfannkuch
Faculty Representatives:	
Arts	Mr David Alcorn
Business and Commerce	Dr Joel Schiff
Engineering	Assoc Prof Bruce Calvert
Ethics Advisor	Assoc Prof Mike Thomas

University Committees:

Assoc Prof Bill Barton: Faculty of Science Staffing Committee; Faculty of Science Representative on Board of Foundation Studies

Assoc Prof C. Paul Bonnington: Associate Dean (IT) Faculty of Science, University Administration Review Committee, Deputy Rep, FoS, University IT Strategy and Policy Committee, Chair – Faculty of Science IT Committee, Faculty of Science representative on the University IT Faculties Forum

Assoc Prof Bruce Calvert: Math Dept. Library Liaison, Math. Dept. rep for Engineering Faculty

Prof Marston Conder: Chair of University's Budget Committee, Member of Vice-Chancellor's Advisory Group (DVCs, PVCs, Deans et al), Member of Capital Planning & Budgeting Committee, Member of Senate, Member of Governing Board of Centre for Molecular Biodiscovery.

Prof David Gauld: University Academic Staffing Committee, Senate, Member of a group of three appointed to undertake a Graduating Year Review of Classical Studies.

Assoc Prof Rod Gover: Appointed to University Academic Staffing Committee as a sub-professorial member for 2006

Dr Sina Greenwood: Faculty of Science EO committee representative, Member of the Tuakana Network , PhD student advisors, R&PGS committee member, Coordinate the MPMP (Maori and Pasifika Mathematics Programme) .

Assoc Prof Eamonn O'Brien: Member of the Faculty of Science IT Committee, Sub-professorial representative for Faculty of Science on University Senate.

Greg Oates: Departmental PhD representative, Faculty of Science SSCC.

Assoc Prof Josef Sirán: Representative at FoA Faculty meetings

Prof James Sneyd: Faculty of Science Staffing Committee

Wendy Stratton: Year 13 Committee

Assoc Prof Michael Thomas: Department representative on Faculty of Science Academic Committee, Science Faculty Staff Student Liaison Committee Member, Arts Faculty Research Committee Mathematics Representative

New Zealand Journal of Mathematics

The New Zealand Journal of Mathematics is jointly produced by the Department and the New Zealand Mathematical Society. Apart from the prestige of producing such a journal a major advantage for the University is the number of international journals which the University receives in exchange for the New Zealand Journal of Mathematics. The Editorial staff consists of Prof. Gaven Martin (Editor), Dr Joel Schiff (Executive Editor), Dr Jianbei An (Associate Editor), Ms Patricia rood (Editorial Coordinator), and Ms Betty Fong (Production Assistant). Members of the 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.

Maintaining Teaching Quality

The Department takes seriously its commitment to quality teaching. Teaching quality initiatives were set in place in 2005 as part of the comprehensive course revisions (see Section I). In addition, apart from individual staff taking responsibility for their teaching the Department uses three further ways to monitor and improve its quality:

i. Systematic and regular student evaluations of both courses and teachers following a schedule determined by the Head of Department and the Teaching Coordinator.
ii. Teaching workshops held about twice a year. At these workshops staff members share and discuss ideas which have been found to work well in the classroom.
iii. Three teaching advisors, experienced and very capable teachers, have been available to attend lectures given by other staff. Usually they provide a written report as well as a verbal follow-up. One advantage is that the Advisors, through observing a range of teaching styles, are able to pick up and pass on quickly good teaching ideas.

IX. OVERALL COMMENTS

I would like to refer readers to the 2004 Report of The Department, in which Professor David Gauld wrote an extended reflection on the changes he has witnessed over 24 years. First I wish to record the appreciation of the Department for his service, and for his part in the positive developments he noted over that time.

Professor Gauld noted the changing staff profile. In 2005 several staff members moved to contract positions in preparation for retirement. This has enabled us to make a smooth transition. We have not

been able to recruit as many as we have lost due to a slow decline in student numbers (largely due to the downturn in Business and Economics students), however the Department does retain its overall staffing strength, and the new appointments are bringing new ideas in research and teaching into our environment.

We have been fortunate to be able to increase our General Staffing by one, but we have also turned over half of our existing staff in 2005. This has resulted in extra load for the remaining staff as they induct new members, and cover the gaps during recruitment. All General Staff, both new and existing, have responded generously and efficiently in this situation, so that now, as we start 2006, the Department is functioning better than ever. All the academic staff appreciate their work strongly.

We look forward, in 2006, to the settling in of our newly designed courses, and revised delivery mechanisms. For Semester 1 at least, this is likely to be a time of trial and consolidation, a time that I am confident will end with considerably improved undergraduate offerings. We are also heartened by the promise of new refurbishment of Building 303 in which we are housed, and for the new tutorial facilities that we will have. As noted by Professor Gauld, this is our highest priority in the immediate future.

Bill Barton
Associate Professor and Head of the Department of Mathematics 12 February 2006