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NEWSLETTER

OF THE

NEW ZEALAND MATHEMATICAL SOCIETY

Contents

PUBLISHER'S NOTICE

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Editorial enquiries and items for submission to this journal should be submitted as text or LaTeX files to mark.mcguinness@vuw.ac.nz.

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EDITORIAL

Thanks contributors for your wonderful efforts culminating in this 98th edition of the NZMS Newsletter. Next year we will reach 100 editions! Would we call that the *centediary*? Sounds like I have a cold (I do...).

Special thanks to John Burnell and Graham Weir for providing a fine obituary for my friend Stephen White, which forms the Centrefold for this edition of our Newsletter.

It is great to see a number of out-reach successes for mathematics in this newsletter, especially the Prime Minister's Supreme Award for Teaching Excellence going to Karl Dodds, a mathematics teacher *par excellence* at the Christchurch Polytechnic Institute of Technology (see the article later). Massey at PN seems to have a very healthy relationship with secondary school math teachers, with annual meetings and the recent "mathsfirst" website launch. There are also a number of reports from the trenches of maths-related publicity. Read on to find out more!

Mark McGuinness
Editor

LOCAL NEWS

THE UNIVERSITY OF AUCKLAND

Department of Computer Science

Bakh Khoussainov gave his Inaugural Lecture on "Structures, Computability, and Logic", which was so warmly received that he repeated it as a Departmental Seminar.

Hans Guesgen has departed, to take up his Chair in Computer Science at Massey University.

Beryl Plimmer has developed InkKit, a software tool for tablet computers which can transform sketched web pages into real ones and hand-drawn code into real programs. Her work was featured prominently in New Scientist (2006 October 2). Beryl explained that "Electronic tools are great for the later stages of design, but they restrict your ideas at early stages. People usually use paper when generating ideas and then have to transcribe them onto a computer when they are more fixed." The system can, for example, merge together different pieces of code, if they are linked with a line. "We're trying to develop this idea for use in all kinds of different domains. This kind of tool can really be used in any design situation where people use freehand drawing."

At ITG'06, Clark Thomborson won the best-paper award, with a bottle of champagne.

Emilia Mendes has gained a Marsden Fund Award of $140,000, for her project on "A causal model for resource estimation of Web projects". Mark Wilson is working with Charles Semple and Mike Atkinson on their project "Algorithms: New Directions and Applications", for which the NZIMA has awarded them approximately $400,000 spread across all participants.

Cris Calude, Beryl Plimmer, Jim Warren and Burkhard Wuensche have received research grants from the University of Auckland Research Committee.

Seminars

John Grundy , "An overview of research funding opportunities in New Zealand".

Sanjay Madria , "Dynamic data replication for Improving data accessibility in ad-hoc networks ", and "DiffXML - detecting changes in XML data".

Paul Bonnington (Department of Mathematics) & Nevil Brownlee, "The KAREN Advanced Network, eResearch and BeSTGRID".

Bob Doran , "Magnetic data storage - the early history".

Ulrich Speidel , "Conference Management 101".

Gill Dobbie & Gerald Weber , "Current trends from VLDB ".

Robert O'Callahan , "FOXHOLES: news from the front line of the browser wars". Bakh Khoussainov, "Structures, computability, and logic".

Garry J. Tee

Department of Mathematics

The June 2006 issue of the ICMI Bulletin (No 58) reports that the Executive Committee of the International Mathematical Union (IMU) has announced details of the 2007-2009 International Commission on Mathematical Instruction (ICMI) Executive Committee. While the positions have to be ratified at the next ICMI EC meeting, Bill Barton has been appointed as one of two Vice-Presidents on the ICMI executive committee.

Marston Conder is President of the RSNZ Academy, for three years from 1st December. He has been invited to be a member of the Royal Society of New Zealand's National Science Panel by the RSNZ Council. This body will be a powerful voice for science, technology, research and business in New Zealand. And Marston has received an invitation to give a keynote address at the joint AMS/NZMS meeting in 2007.

Rod Gover has received a Marsden Fund grant of $433,100, for his project on "Natural operators, special structures and conformal techniques".

Sina Greenwood visited the National University of Samoa for a week in October, and was invited to give a presentation on the Mathematics Department's programme to help improve the recruitment and success of Pasifika students.

Mike Meylan has received a $3000 ISAT grant, and the Marsden Fund grant to Mike Meylan (with Vernon Squires) has been extended for 2 years.

Judy Paterson and Bill Barton have won a $50,000 research grant, to study the ways in which teachers' understanding of mathematics affects their teaching.

Boris Pavlov will be part of a programme at the Newton Institute, Cambridge in 2007. Reuben Hersh has reviewed the "Selected Papers of Peter Lax" (Springer, 2005) in the Bulletin of the American Mathematical Society v.43 (4) October 2006, 605-608. The reviewer tells that "The applicability of the Lax-Phillips scattering theory to waves in non-Euclidean space was discovered by Ludwig Fadeev and Boris Pavlov, Peter reminds me".

Philip Sharp gave a Public Lecture on "Near-Earth Objects", following which he was interviewed by Dean Willams in Science Report on National Radio. Phil has received a UARC grant to visit UCLA.

Arkadii Slinko visited CIREQ in Montreal for September, October and November of 2006. CIREQ was founded in 2002 as a research centre in economics and quantitative analysis, resulting from a partnership among three Montreal universities, Universit de Montral, McGill, and Concordia. His stay there was quite productive, as 4 papers were finished, sent to journals and published as working papers of CIREQ. He gave a talk at the Microeconomic Seminar of the Department of Economics of the University of Montreal, and he visited the mathematicians of the Bank of Montreal at its headquarters in Toronto. Also he gave a colloquium talk at the Department of Mathematics of University of Ottawa, and he gave a talk at the Discrete Mathematics seminar of Carleton University. Then he attended the 1st International Workshop on Computational Social Choice (COMSOC) in Amsterdam (December 5-8), where he presented two papers (with different sets of co-authors) on complexity of voting procedures and complexity of lobbying.

Tom ter Elst joined us early in 2006 from Eindhoven University, which has now officially awarded him their first and second prizes for the best lectures for the courses Calculus 1 and Calculus 2 in Business Engineering, in the year 2005-2006.

Mike Thomas gave an invited Plenary Address on "Developing Versatility in Mathematical Thinking", at the Festschrift for Eddie Gray and David Tall held at Charles University in Prague.

Shayne Waldron will be an invited speaker at the Fourth International Conference on Multivariate Approximation: Theory and Applications in Cancun, Mexico.

Several members of the department attended conferences around the world in the middle of the year.

Sina Greenwood, Ivan Reilly, Stevie Budden and David Gauld attended the conference in Oxford (August 7-10) to honour Peter Collins and Mike Reid on the occasion of their retirements. Sina, Ivan and David gave contributed talks. Those four plus Warren Moors then went on to the 10th (5-yearly) Topology Symposium in Prague (August 13-19), one of the biggest topology gatherings on the calendar. Warren gave a plenary talk while Sina, Ivan and David gave contributed talks. Stevie and David then went to the International Conference on Set-Theoretic Topology in Kielce, Poland (August 20-25). David spoke on "Games and metrisability of manifolds" at Oxford and Kielce, and on "'The homeomorphism group of non-metrisable manifolds" at Prague. All of them suffered to varying degrees from the chaos at Heathrow Airport, following the arrest (during the Oxford Conference) of a number of suspected would-be terrorists.

On November 22, we held a farewell function for three members of the department who are leaving early in 2007.

Roy Swenson is retiring after 40 years on the staff. Many members of the department remember Roy as a Tutor in their student days, and the whole department expressed its appreciation of his work with tutors and students for many years. His farewell was punctuated with many reminiscences of the department in the 1960s. David Thomson also has a long history with the department, first being employed in the 1970s before teaching at Green Bay and then returning as a Tutor in the early 1990s. David has been a stalwart of 100-level

teaching, and his contribution to course development was acknowledged. David retires from teaching, but he will continue a career in counselling. Viliami Latu came to the department in 2003, although he had been part of the department's first pre-service teacher education intake several years before. Viliami has worked in the Tuakana programme, with special responsibility for Pasifika students. He is moving to De La Salle College in Manukau City, as Head of the Department of Mathematics.

Anthony and Thyra Blaom announce the birth of their son Oliver Garion Blaom on September 27.

Recent visitors include: Prof. Abdolaziz Abdollahi (Shiraz University, Iran), Prof. Deborah Ball (University of Michigan), Prof. Hyman Bass (University of Michigan), Prof. Peter Brooksbank (Bucknell University), Prof. Pavel Exner (Doppler Institute, Prague), Prof. John Grue (University of Oslo), Prof. Richard Hall (Concordia University), Dr Frank Himstedt (Munich University of Technology), Dr Sione Ma'u (Indiana University), Julia Novak, (Royal Holloway College), Dr Robyn Pierce (Ballarat University), Prof. Derek W. Robinson (ANU), Dr Colva Roney-Dougal (University of St Andrews), Dr Izolda Sturova (Lavrentyev Institude of Hydrodynamics, Russia), and Dr Martin Wechselberger (University of Sydney).

Four PhD students in the Department of Mathematics at the University of Auckland have recently won Top Achiever Doctoral Scholarships from the Tertiary Education Commission (TEC). Inga Wang, Elan Gin and Erin Higgins are all working on mathematical models for biological mechanisms, which allow scientists to accurately predict the response of the body to changes in environment, such as effects of genetic malfunction or chemical interference. Eyal Loz is using new mathematical and computational methods to find the largest known combinatorial graphs (networks) with given diameter and given vertex degree. Elan and Eyal were previously supported for their Masters degrees through the NZIMA's programmes in Dynamical Systems and Combinatorics respectively.

Josef Silhan, who was one of the first of the NZIMA's scholarship students, successfully defended his PhD in July after a little over three years of study and research, supervised by Rod Gover. Josef wrote a thesis on "Invariant differential operators in conformal geometry", and one of his examiners commented that "the quality of the thesis is exceptional on an international level, and it exceeds substantially the usual standards for a PhD thesis". Josef has taken up a postdoctoral research position at Marsaryk University in the Czech Republic.

Alan de los Santos had an extremely successful PhD oral in defence of his thesis and, subject to the making of minor corrections to the thesis, and the approval of the relevant higher authorities, he will be able to graduate as Dr Santos. Gareth Hegarty also had an extremely successful PhD oral defence and, subject to similar approval, he will soon be known as Dr Hegarty!

Graduate Tara Bonda was awarded a DAAD scholarship to undertake a 6-month mathematics research project in Germany.

The department has used PBRF money to supplement the 12 Faculty Summer Scholarships, so that about 20 students will be undertaking research projects over the summer period. The PBRF allocations for the internal money for 2006/7 have resulted in 12 of our staff sharing $30,000.

Seminars

Prof. Pavel Exner (Doppler University, Prague), "Ideal graphs - their nontrivial aspect, or what is the meaning of the vertex coupling", and "Leaky graphs - what they are, and their spectral and resonance properties", and "Generalized graphs - or what happens if a quantum particle has to change its dimension".

Prof. Richard Hall (Concordia University), "Systems of identical particles".

Prof. Abdolaziz Abdollahi (Shiraz University, Iran), "The numerical range of a composition operator".

Dr Sione Ma'u (Indiana University), "Pluripotential theory for convex bodies in R^n"

Prof. Derek W. Robinson (ANU), "Commutator theory on Hilbert space".

Prof. Ernie Kalnins (University of Waikato), "Separation of Variables".

Dr Paul-Andy Nagy , "Principles of separation of variables in the spectrum of the Laplacian".

Prof. Hyman Bass (University of Michigan), "Rationality of the zeta function of a finite graph".

Prof. Hyman Bass & Prof. Deborah Ball (University of Michigan), "Improving teaching and teaching proving".

Dr Frank Himstedt (Munich University of Technology), "Alternating squares of modules for cyclic groups".

Prof. Peter Brooksbank (Bucknell University), "Alternating squares of modules for cyclic groups".

Dr Colva Roney-Dougal (University of St Andrews), "Classification and construction of finite permutation groups".

Dr Martin Wechselberger (University of Sydney). "Giant Squid - Hidden canard - the geometry of the Hodgkin-Huxley".

Prof. Mark Nelson & Dr Harvi Sidhu (University of Wollongong), "Compost piles and wastewater treatment".

Dr Ilze Ziedins (Department of Statistics), "When networks go bad...".

Prof. Alan McIntosh (ANU) "The square root problem of Kato for elliptic operators: survey", and "The square root problem of Kato for elliptic operators: survey, solution and sequel",

Dr Sina Greenwood , "Characterising continuous functions", and "750 Assignment 3, question 4, 2006".

Dr Jiling Cao (Auckland University of Technology), "Baire spaces, Tychonoff powers and the Vietoris topology".

Garry J. Tee

Department of Statistics

Captain Cook's first expedition (1768-1771) included the botanists Daniel Solander (1733-1782) and his student and friend Joseph Banks. The very many specimens collected by Solander, and the notes which he wrote, have been very useful for later researchers. Solander was born in 1733 at Pitea, then the northernmost town in Sweden. In 1986 a group of people from Pitea followed Solander's path around the world: they included the Mayor of Pitea and the barrister Per Tingbrand, who has written much about Solander. On behalf of the Swedish Government and the city of Pitea, they presented a bronze portrait bust of Solander to the University of Auckland - that bust is housed in the German Research Library.

In 2006 the Solander Program was set up by several universities in Scandinavia, New Zealand and Australia, to coordinate their research activities. The first Solander Fellowship has been awarded to Ilze Ziedins, to enable her to spend a month at Lund University collaborating with some researchers there. James Russell is finishing his PhD research on rat colonizing, and he has been awarded a Solander Travel Grant for the same purposes. Also, in October James won First Prize in the SGGES Student Seminar Day, with a talk entitled "The paradox of invasion: why are rats such good invaders?"

Alastair Scott has won the Waksberg Award from the American Statistical Association and the Statistical Society of Canada, for his work on survey sampling.

Chris Triggs and James Curran were co-authors of the paper that this year won the Forensic Science Society's PW Allen award, for best paper published in 'Science and Justice' in 2005: T. Hicks, F. Schutz, J.M. Curran and C.M. Triggs (2005). "A model for estimating the number of glass fragments transferred when breaking a pane: experiments with firearms and hammer", Science and Justice, 45(2), 65-74. A story was carried on the 10th of November in the 'Dominion Post'.

Patricia Metcalf was author or co-author of 60% of the articles in 17th November issue of the 'Journal of the New Zealand Medical Association', 17 November 2006, Vol 119 No 1245, and her work was the subject of the Editorial. She also had several other articles published in this same month.

Russell Millar won funding from the University Research Fellowships Fund, in a very competitive process, to complete his book "Applied Likelihood Methods: With examples in R and SAS". It could be quite useful for folk who are interested in the relative virtues of those two software sytems. Russell was interviewed by Eva Radich about aspects of probability, on National Radio's Sunday Morning programme on 12 November.

Steven Miller has won the NZSA prize, for best talk presented by a New Zealand student presented at the Australian Statistical Conference/New Zealand Statistical Association Conference 2006. Steven has a full-page article in the 'New Zealand Education Review', 11(35), September 8, 2006 about his work on rats. And Tim Langlois appears on the facing page, explaining his PhD work.

Alastair Scott, Chris Wild and Alan Lee have won a Marsden Fund grant, for their project on model fitting with complex sampling structures.

Seminars

Dr David Bryant (Department of Mathematics), "Algebraic statistics and computational phylogenetics".

Dr Yong Wang , "Extending the Fisher scoring and Gauss-Newton methods for complex statistical optimisation problems".

Prof. Jon Wellner (University of Washington), "Estimation and testing with interval-censored data".

Mat Pawley , "Using variography to estimate a spatial systematic sample standard error".

Dr Lara Jamieson (Cambridge University), "Analysing clinical trial data with missing observations at baseline and at outcome".

Dr James Curran , "The effect of uncertainty in the number of contributors to DNA stains".

Prof. Denis Mollison (Heriot-Watt University, Edinburgh), "Small worlds and giant epidemics".

Dr Arden Miller , "Using supersaturated designs for screening applications".

Tim Langlois (Leigh Marine Laboratory), "Estimating the effect of fishing on snapper populations: an example from Great Barrier Island".

Dr Hadley Wickham (Iowa State University), "An implementation of the grammar of graphics".

Garry J. Tee

UNIVERSITY OF CANTERBURY

Department of Mathematics and Statistics

We are very happy to welcome back Neil Watson, whose illness was reported in the August newsletter. Neil spent three months in hospital and underwent surgery for a quadruple heart bypass and defibrillator implant. He's now back in the department every morning, and hopes to resume full-time work in the New Year.

In September our departmental administrator Julie Daly returned from a three-month secondment. Justine Willett ably served as Julie's replacement during her absence. Our thanks and best wishes go to Justine as she moves on to a permanent position at Princess Margaret Hospital. We also welcome two postdoctoral fellows, Britta Basse and Erick Matsen. Britta, who did her PhD here, is familiar to many in the department.

Dr Josef Berger, Douglas Bridges's postdoctoral fellow, left the department for the Japan Advanced Institute of Science and Technology at the end of September. He has taken up a fellowship from the Japan Society for the Promotion of Science to continue working in the field of constructive mathematics.

Scott Graybill and Daniel Lond organised the first South Island Mathematics and Statistics Post-Graduate Conference in Queenstown in November. The idea was to give postgraduate students a chance to mingle and talk about their research in a relaxed setting. Scott and Daniel are PhD students from this department. A separate report on the conference appears elsewhere in this newsletter.

Wedding bells: Ben Martin and Rachel Shelton were married in late November at the Old Stone House in Cracroft, Christchurch. Rachel, originally from Brisbane, has been living here since mid-2005. She works in the IT section of the university's Central Library. A large contingent of Australians came over for the event. They were treated to a typical display of Christchurch spring weather: strong winds, rain, and enough sun to burn the unwary. The big bowl of bananas at the reception was particularly popular with the visitors; bananas are currently selling for $11 per kilo in Queensland.

The department briefly hosted the finalists from the Eton Senior Mathematics Competition in August. The fifteen schoolpupils sat a two-hour exam in the morning, then did a whistle-stop tour of several College of Engineering departments. We entertained them with food, posters and a display by Rick Beatson of surface-fitting software: the gory shot of a titanium plate being grafted to the surface of someone's skull was a particular crowd-pleaser.

Douglas Bridges visited the University of Munich and attended the conference "Computational structures for modelling space, time and causality" in Dagstuhl, Germany, in August. He also went to the annual "Computability and Complexity in Analysis" meeting, held this year in Gainesville, Florida, in November. En route, he and Viv had ten days of pure holiday, seeing their son and the sights in San Francisco. Douglas's book "Techniques of Constructive Analysis" with Luminiţa Simona Vîţă has now appeared as a Springer Universitext.

Your correspondent incorrectly reported in August that Douglas has just celebrated his "sixtieth 60th birthday". This would make the achievements of Vietoris, who lived to nearly 111 and was still publishing at 100, pale into insignificance. Apologies to Douglas, who has in fact turned 60, not 3600.

Qui Bui made a three-week research visit to Macquarie University in November, supported by a Visiting Fellowship from that university. He also gave a talk at the Australian Mathematical Society meeting at Macquarie in September. Arno Berger

took part in the workshop "Measurable dynamics, theory and applications" in Canada in August. Jennifer Brown visited the University of Queensland in August.

Mathematics student Tim Candy has been awarded an ANU Summer Research Studentship. Two of our other undergraduate students, Matthew Hendtlass and Qian Hou, have been awarded University of Canterbury Summer Scholarships to do research projects over the summer. They will work with Douglas Bridges and Dominic Lee respectively.

Recent visitors include: Dr Bhalchandra Thatte (Massey), Kate Lee (QUT), Prof James Oxley (Louisiana State), Prof Geoff Whittle (Victoria), Simone Linz (Dusseldorf), Beata Faller (Eötvös University), Dr Michael Bate (Oxford) and Prof Rainer Loewen (Braunschweig). Dr Thomas Forster (Cambridge), a visitor to the Philosophy Department, ran a series of seminars here on countable ordinals.

Seminars

Prof Stephen Gardiner (University College Dublin), "Potential theory of the farthest point distance function"

Prof Denise Osborn (University of Manchester), "A random walk through seasonal adjustment: noninvertible moving averages and unit root tests"

Dr Colin Fox (University of Auckland), "Bayesian methods for inverse problems: why and how"

Dr Oliver Will (University of Canterbury), "Estimating the number of essential genes in random transposon libraries"

Bill Rea (University of Canterbury), "Do long-memory time series have amnesia?"

Dr Josef Berger (University of Canterbury), "The uniform continuity theorem in the light of constructive reverse mathematics"

Dr Ben Martin (University of Canterbury), "The University of Southampton National Cipher Challenge"

Dr Peter Renaud (University of Canterbury), "On the geometry of the Dirac equation"

Dr Wolfgang zu Castell (GSF National Research Center for Environment and Health), "Basis function methods with applications from life sciences"

Ben Martin

MASSEY UNIVERSITY

Institute of Fundamental Sciences (Palmerston North)

As 2006 is an even number it was the turn of the Mathematics Discipline at Massey to host the 9th Manawatu-Wellington Applied Maths Conference and this event took place on the 26th of October 2006. This conference was being sponsored by IFS and the New Zealand Branch of ANZIAM (Australia New Zealand Industrial and Applied Mathematics) and was organised by Igor Boglaev and Marijcke Vlieg-Hulstman. It was great that mathematicians from Industrial Research Limited (Gracefield, Lower Hutt) and Victoria University came to this meeting. The participants from Massey University consisted of members of ITE, I2ST (two statisticians), IFS and four from IIMS (Albany). Robert McKibbin, Carlo Laing, Mick Roberts and Graeme Wake travelled a fair distance to attend the meeting. The variety and quality of talks were excellent and so was the presentation! It appears that overhead transparencies are definitely on the way out! One of the highlights of the day was the presentation of the Industrial Research Limited Applied Mathematics Bursary to Jonathan Hunt by Graham Weir of IRL. Jonathan Hunt is currently doing honours in Mathematical Physics. Congratulations Jonathan!

The Applied Maths Day was again a success and at the conclusion a subgroup converged to the "Empire Hotel" to celebrate this with recovery drinks. The dinner was held at "The Gallery Caf" where people could catch up on gossip while eating and sipping wine.

By the time you read this news, the Colloquium in Hamilton will be in the past. There will be a good turn up from the Turitea Campus at Palmerston. The Reps are: Brett Ryland, Christine Burr, Dion O'Neale, Igor Boglaev, Kee Teo, MarijckeVlieg-Hulstman, Peter Kelly, Philip Zhang, Robert McLachlan and Tammy Smith.

The annual evening for mathematics and statistics teachers and university mathematics and statistics staff was held this year on Thursday 19 October 2006.

Christine Burr reports:

"After a couple of years where the attendance numbers were down, it was great to see over 60 at this years evening.

After meeting for tea and coffee, the evening began with an introduction by the Deputy Vice-Chancellor, Professor Ian Warrington. This was followed by a presentation of the mathsfirst web site by Dr Tammy Smith. The site had been officially launched in September, but many of the teachers had not experienced it yet, so Tammy's talk was very well received with many oohs and aahs and comments like "that's brilliant". No doubt many of the teachers there would have enthusiastically presented the site to their fellow teachers and students the next day.

Tammy's presentation was followed by a panel discussion on The New Mathematics Curriculum. The panel was made up of Dr Alisdair Nobel, Statistics Lecturer, Marc Paterson, HOD maths Awatapu College and Anne Lawrence, Numeracy Advisor, Centre for Educational Development. An extremely informative discussion took place. The knowledge that the panel was able to give to the teachers was tremendous; in fact it was quite disturbing at how little information the teachers had been given on the new curriculum. Once again, much of this discussion would have found its way back to the high schools the next day, and many teachers expressed their gratitude for including this discussion in the evening.

A delicious meal was provided by Wharerata, courtesy of the Deputy Vice-Chancellor, during which the teachers were able to network with each other and the Massey Staff. On its completion, all were treated to two very interesting talks.

Professor David Penny from the Allan Wilson Centre for Molecular Ecology and Evolution spoke first on "Estimating the Size of the Maori Founding Population of New Zealand". His very enlightening talk explained how this was done by random sampling of mitochondrial haplotypes combined with simulation of population expansion.

The evening finished with a talk on "Statistical Modelling in Transportation Research" given by Massey University's new Chair of Statistics Professor Martin Hazelton. He was able to explain why although there is massive scope for savings through efficiencies predicted by mathematical models, the use of many current models is questionable."

Bruce van Brunt has come back safe and well from the Land of the Morning Calm. Like last year, Bruce spent two months at KAIST in South Korea. He came as part of an applied mathematics visiting professor team and lectured on the calculus of variations among other topics. When he was about to leave Mark McGuiness turned up to take over.

Jonathan Marshall has left us to take up a Postdoctoral Fellowship at Massey University. It is a joint position between the Institute of Information Sciences and Technology (Statistics) and the Institute of Veterinary, Animal & Biomedical Sciences (Epidemiology). The role is to develop novel statistical methods (in the fields of spatial smoothing and non-parametric or semi-parametric estimation) and to apply these to Epidemiological models. We wish Jonathan all the best and we like to thank Jonathan for all the work he has done for us. We had to say goodbye to Padma Senerath as she (and her family) will be leaving for Dunedin early December. Padma joined us nine years ago, completed an MSc and PhD with Gillian Thornley as her supervisor. During her PhD study Padma was appointed as a Graduate Assistant and when this contract was finished she remained involved with the teaching of mathematics. Thanks a lot Padma for your loyalty towards mathematics, students and staff.

The Allan Wilson Centre had its annual meeting from the 10-12th October at the Rugby Institute at Massey. PhD students, Postdocs and investigators attended from as far a field as Dunedin and Albany. The first two days dealt with research updates from many different members of the AWC. On the mathematical front, Bhalchandra Thatte presented an interesting (but perhaps distressing) result demonstrating the impossibility of reconstructing a unique pedigree from genetic similarities alone. On the third day Principal Investigators were banished to discuss the AWC bid for the next round of CORE funding (applications are due on the 1st of December) while the students and Postdocs ran a symposium designed to share skills amongst the younger members of the AWC.

Barbara Holland was one of the recipients of the Massey University Early Career medal for her work on phylogenetics - the study of the evolutionary relationships between species. The research medals were presented at the Excellence in Research and Teaching Awards Gala Dinner by Nobel Laureate Professor Peter Doherty. The award comes with a $10,000 research grant which Barbara plans to use to cover the costs of a trip to Cambridge in September 2007 to take part in a Phylogenetics programme at the Isaac Newton Institute for Mathematical Sciences, and also to support a summer student in 2007/2008.

Graduate Seminars Series

A/Prof Igor Boglaev , "Monotone iterates for nonlinear difference schemes of parabolic type in the canonical forms".

Marijcke Vlieg-Hulstman

Institute of Information and Mathematical Sciences (Albany)

Jeff Hunter returned to NZ late August after spending nearly ten weeks in Europe and the USA. Overall his itinerary consisted of 18 flights and nearly 29,000-miles. We reported on his trip to Europe in the last newsletter. In the US he was a keynote speaker at a two-day workshop on "Matrix Theory and Computations for Research in Social and Physical Sciences" that took place in Penn State University, State College. He also met up with Emeritus Professor Shayle Searle of Cornell University, Ithaca, engaged in collaborative research with Professor Miki Neumann from the University of Connecticut and visited Professor Kulkarni at the University of North Carolina at Chapel Hill.

Gaven Martin participated in the 15th General Assembly of the International Mathematical Union (IMU) that was held in Santiago de Compostela, Spain, and in the International Congress of Mathematicians (ICM) in Madrid. During the meeting in Santiago de Compostela he was elected to the IMU Nominations Committee. Gaven will also be a member for Mathematical & Information Sciences & Technologies (MIST) in the RSNZ council for the next 2 years. Congratulations Gaven!

Winston Sweatman spent six weeks in Europe. He first attended the International Astronomical Union General Assembly in Prague where he presented a poster "Full Ionisation In Binary-Binary Encounters With Small Positive Total Energy". He was then a Research Visitor at the University of Edinburgh and worked with Professor Douglas Heggie and his N-body research group. Winston also visited Glasgow Caledonian University for a day and presented a seminar: "Interplay orbits in gravitational few-body system". In Glasgow he discussed several projects with Professor Bonnie Steves.

Carlo Laing and Alona Ben-Tal participated and presented talks at the joint SIAM-SMB Conference on the Life Sciences in Raleigh, North Carolina, USA. Alona spent the week before the conference at NIH in Bethesda and worked with Dr Jeffrey Smith.

Carlo Laing and Amanda Elvin both gave posters at the Inaugural Queensland Brain Institute Workshop on Mathematical and Computational Neuroscience in Brisbane in August.

Three IIMS staff gave a joint presentation to Connect Auckland in September. Connect Auckland is an organization formed to promote industry/academic cooperation and collaboration. These are Heath James (Computer Science), Claire Jordan (Statistics), and Graeme Wake (Industrial Mathematics). The three presentations are available on the Connect Auckland website: http://www.connectauckland.com/Programmes/Technology%20Briefings/Previous%20Presentations

Four IIMS staff attended the 6th Manawatu-Wellington Applied Mathematics Day at Massey University's Palmerston North campus on 26th October. All four presented papers: Carlo Laing, "Periodically-forced finite networks of heterogeneous coupled oscillators: a low-dimensional approach", Robert McKibbin, "Modelling pollen distribution by wind through a forest canopy", Mick Roberts, "How to model a virus that doesn't (yet) exist", and Graeme Wake, "Effective thermal conductivity of composite material- with application to frozen foods." It was a most successful day.

The 3rd IIMS Post Graduate Conference took place at the end of October and was very successful again. The conference is organized and run by students. Jo Mann was once again on the organizing committee and, together with Maarten Jordens, edited the Conference Proceedings. 15 students presented talks and 13 posters were on display throughout the day. Ratneesh Suri was awarded a $500 travel grant for the best paper and presentation while Amanda Elvin and Ravi Chemudugunta both won prizes for the best poster.

Graeme Wake went to Bangkok, Thailand as a Distinguished Visiting Professor to Mahidol University, and King Mongkut's University of Technology Thonburi in North Bangkok for a week in early November. While there, he evaluated a proposal on a PhD program, gave seminars and teaching workshops on environmental modelling and cell-growth, and assisted in the formulation of the proposal to form a Centre of Excellence in Mathematics for Thailand (nineteen Universities are involved in this from within Thailand).

Robert McKibbin and Tammy Smith (IFS, PN) attended the 28th NZ Geothermal Workshop 2006, held at the University of Auckland 15-17 November, and presented two papers: McKibbin & Smith: "Hydrothermal eruption jets: air entrainment and cooling" and McKibbin: "Modelling deposition of hydrothermal eruption ejecta".

A new Centre for Mathematical Biology (CMB), directed by Mick Roberts, was launched in November. To mark the occasion we had a small meeting.

Alona Ben-Tal, Marie Fitch, Carlo Laing and Mick Roberts gave talks (see the details below).

Congratulations to Paul Cowpertwait who is included in a project funded by the ARC (Australian Research Council) for 3 years. The project is part of the National Research Priority "An Environmentally Sustainable Australia". Paul will be a partner investigator (with Assoc Prof Martin Lambert & Dr Andrew Metcalfe, University of Adelaide, and Prof George Kuczera & Dr Mark Thyer, University of Newcastle) working on "A stochastic space-time model of rainfall fields in large heterogeneous regions".

At the Royal Society of New Zealand Science Honours Dinner, held November 15 at Auckland, Professor Jeff Hunter was awarded the Campbell Award, the highest award of the New Zealand Statistical Association, to recognise his "contributions to statistical research and education, and services to the profession of statistics" as well as receiving Honorary Life Membership of the New Zealand Statistical Association. Congratulations Jeff!

Congratulations to Carlo Laing, Tasos Tsoularis and Shaun Cooper who were all been promoted. Carlo and Tasos are now Senior Lecturers and Shaun is a Senior Lecturer Range 2.

Congratulations to Heung Yeung (Frederick) Lam who has now satisfied all the requirements for PhD. His PhD thesis is entitled: "q-series in Number Theory and Combinatorics". Congratulations too, to his Supervisor Shaun Cooper.

Congratulations to Graeme Wake who recently joined the CoRE "National Growth Centre and Development", directed by Professor Peter Gluckman of the University of Auckland, as an Associate Investigator. He joins the "Life History" platform.

Congratulations to Beatrix Jones and Danny Walsh on the birth of their son Albert.

Visitors

A PhD student (Basayamas Pimpunchat) from Mahidol University arrived later in November on a joint PhD program between Massey University and Mahidol University under their UMAP program. The joint project is Modelling Pollution in rivers using data from Thailand's most polluted river, the Tha Chin River. Busayamas is here for one year. She follows Montri Thongmoon, from King Mongkut's University of Technology Thonburi, Bangkok, who, as part of his PhD studies, spent 9 months this year working with Robert McKibbin. Montri is working on modelling air pollution movement in semi-enclosed bus station roadways, and is now back in Thailand completing the write-up of his PhD thesis.

We have five summer students working with us this summer. Daniel Playne and Xerxes Mandviwalla are working with Alona Ben-Tal, Jessica (Yue) Zhao is working with Mick Roberts, Sweta Baldawa is working half-time with Claire Jordan and Jie Tang is working half-time with Dr Barry McDonald.

Seminars

Dr David Bryant (University of Auckland), "Algebraic Statistics and Computational Phylogenetics".

Dr Shaun Cooper , "The life and work of Srinivasa Ramanujan".

Dr Ilze Ziedins (University of Auckland), "Congestion paradoxes: why adding extra capacity to networks is not always a good thing".

Dr Harvi Sidhu (ADFA, Canberra), "A Simple Spatial Model for Self-Heating Compost Piles".

Dr Mark Nelson (University of Wollongong), "Activated sludge wastewater treatment process: Performance comparison between a two-reactor cascade and a single tank."

Professor Stephen Haslett (Massey University, Palmerston North), "What are the Residuals for the Linear Model?"

Dr Alona Ben-Tal , "The fascinating complexity of respiratory rhythm generation in the brainstem".

Dr Beatrix Jones and Ms Marie Fitch , "A comparison of graph based methods for classifying gene functions from microarray data".

Dr Carlo Laing , "Modelling bursting in an electric fish neuron".

Prof. Mick Roberts , "Pandemic influenza: How to model a virus that doesn't (yet) exist".

Alona Ben-Tal

Institute of Information Sciences and Technology (Palmerston North)

Mark Bebbington was peacefully minding his own business, giving a short presentation on the modelling of eruption intervals at Mt Taranaki, when he incautiously advanced the estimate of a 1/3 - 1/2 probability of an eruption within the next 50 years. Within the hour he was being interviewed

on Radio New Zealand, and was tracked down by a TVNZ crew the following day. He says that the most interesting experience was doing Radio Live with Graeme Hill - having words like "pyroclastic flow" tossed at you by an interviewer at 7.20am requires more than the one cup of coffee beforehand. Jonathon Godfrey also made the news, appearing very briefly on TV1 news in March (already on the NZSA web site) and a Radio NZ item on Morning Report around the same time. Interestingly neither Jonathan nor Mark was credited in the media with being a statistician: Mark was designated as "vulcanologist" and Jonathan as "blind man". Clearly "statistician" isn't sexy enough.

Our new Professor, Martin Hazelton, was at the ASC/NZSA conference in Auckland to give an invited presentation on density deconvolution, and was pleased to able to meet a number of members of the NZ statistical community for the first time. He has recently been awarded, jointly with Nigel French, professor of veterinary epidemiology, a Massey University award to fund a postdoctoral research fellow for 2007 & 2008.

Quite a number of us made, one way or another, the long trek to Auckland for the ASC/NZSA conference in July. Ganesh hired a van for the weekend roadtrip along with Ganes, Greg and Alasdair. They met with some interesting weather conditions on the desert road (pictured above). Chin Diew and Geoff opted for the potentially quicker method of flying up on the Monday morning, but after circling the fog around Auckland airport a few times were diverted to Rotorua, to arrive by bus just in time for lunch.

Chin Diew Lai's new book "Stochastic Ageing and Dependence for Reliability" with M Xie of Singapore has just been published by Springer. Chin Diew delivered an invited talk at the ASC/NZSA conference in Auckland, on "Compliance inspection and conformity testing in the presence of measurement or inspection errors".

Doug Stirling attended ICOTS 7 in Salvador, Brazil in early July. He has recently started developing experimental design material for CAST as part of a contract with Nestl.

Geoff Jones spent two weeks in the UK and one in California in July, first attending MOLS 2006 at the University of Essex to learn something about longitudinal surveys, then meeting with veterinary epidemiologists at the University of Liverpool, and finally spending a week with Wes Johnson at the Centre for Animal Disease Monitoring of the University of California, Davis. We hosted Wes briefly at Massey in August, and he will be returning to New Zealand next year for the Conference in Honour of John Deely in Christchurch.

In October Ganes and Alasdair organized another one-day Stats Forum at Massey in conjunction with AgResearch Ltd and Grasslands Research. The keynote speaker was Dr David Baird.

We have two new PhD students: Marisa Isidro from the Philippines, working with Steve Haslett and Geoff Jones on small-area estimation, and Ting Wang from China working with Mark Bebbington (plus David Harte and David Vere-Jones) on earthquake modelling and prediction.

Ricardas Zitikis from the University of Western Ontario has visited again to work with Mark Bebbington and Chin Diew Lai on joint research.

Geoff Jones

UNIVERSITY OF OTAGO

Department of Mathematics and Statistics

Derek Holton has been invited by Marcela Santillan, the Chair of the IPC for ICME-11, to chair the Survey Team: Recruitment, entrance and retention of students to university mathematics studies in different countries. This team will work to survey the state of the art in this area in particular with regard to identifying and characterizing important new knowledge, recent developments, new perspectives and emergent issues.

Congratulations to Robert Aldred who was the joint recipient (with Mick Roberts) of the 2006 NZMS Research Award presented at the recent Colloquium at Waikato.

On November 22 and 23 a new venture was held in Queenstown. This was the First South Island Maths and Stats Post Graduate conference. The idea was to give graduates from Canterbury and Otago the opportunity to get together and tell each other something of the work they were doing and to generally experience the benefits of conferences in a relaxing setting.

The conference was organised by Scott Graybill, Daniel Lond and Alex James of Canterbury who should be congratulated for doing such an outstanding job.

There was some hope expressed that there wouldn't be a Second South Island Maths and Stats Postgraduate conference. This was because the aim is to make the conference open to all graduate students in the country from next year.

Derek Holton provided the above report, as well as the following item on his recent Study Leave.
From mid October to mid November I spent an idyllic time on study leave at the University of Chichester's Bognor Regis campus. It was idyllic because the phone in my office there rang only

twice the whole month, I had no meetings to attend for the whole time, and I worked solely on what I was interested in. I am convinced through this and previous such experiences that, if there is a heaven, it is a close approximation to permanent study leave.

The main aim of the visit was to complete my section of a book for maths teachers with a working title of Nurturing the Mathematical Mind. This aims to show that mathematics is more than algorithms by looking at a number of problems and thinking about what is a mathematician and how such a person works.

Boris Baeumer was an invited speaker at the Evolution Equations 2006 Conference in Belgium and France from 21 August 4 September.

Richard Barker assisted as an instructor at a Workshop on information Theory in Ecological Statistics and Mark Recapture Modelling in Perth from 3-11 August. This was for scientists associated with the Department of Conservation and Land Management in Western Australia.

Seminars

Ami Radunskaya (Pomona College, Claremont, California), "Mathematics in the Treatment of Cancer"

Jonni Bidwell , "Counting the Days - Mayan Myth Math and Calendars 12. 19. 13. 9. 6. 10, Kimi 19 Xul"

Boris Baeumer , "Anomalous Dispersion along Flow Lines"

Charles Tadjeran (University of Canterbury), "Finite Difference Methods for Superdiffusive Differential Equations"

Mik Black (Department of Biochemistry), "The Role of Statisticians in the Analysis of Data from High Dimensional Genetic, Genomic and Proteomic Technologies"

John Enlow (AD InstrumentsA), "Mathematician in the Wild"

Jon A Wellner (University of Washington, Seattle WA, currently visiting VUW), "Estimation and Testing with Interval-Sensored Data"

Ray Hoare (Hoare Research), "Using Mathematica in Teaching and Research"

Warren Palmer "Jenny Can't Add But Can She Think? A Brief Look at the Increasing Impact of Graphics Calculators on Maths Education"

Richard Barker , "StatChat: Model Selection and Model Averaging"

Gerrard Liddell , "Making a Difference"

Roger Littlejohn (AgResearch Ltd, Invermay), "A Semi-Markov Model for Biting Time Series"

Andrew Gormley and Brian Miller (Department of Zoology and Maths and Stats and Department of Marine Science), "Estimating Fecundity of Hector's Dolphins when calves are not always detected and Eavesdropping on Sperm Whales passive acoustic localization"

Final presentations of Honours Statistics Projects:

Sam Brilleman , "Limits to Human Running Performance"

Zijia Jiang (Carrie) , "Gender Difference in Number of Sexual Partners"

Hee Mong Wong , "Financial Time Series"

Katrina Sharples (Dept of Preventive and Social Medicine), "Confidentiality of Interim Data in Clinical Trials"

Final presentations of COMO Projects:

Andrew Darlington , "Scheduling Factory Production"

Caroline McLean , "Modelling Squat for Vessels"

Brian Walters , "American Option Valuation"

Josh Howie , "Topology and Modern Analysis"

James Curran (The University of Auckland), "Some Issues Surrounding the Interpretation of Low Copy Number (LCN) DNA Evidence"

Peter Dillingham "The ability of NZ seabirds to sustain by-catch related mortalities"

Mike Thomas (The University of Auckland), "Mathematical Thinking and the Graphic Calculator"

Richard W Katz (National Centre for Atmospheric Research Boulder Colorado USA), "Hidden and Not-So-Hidden Markov Models: Implications for Environmental Data Analysis"

Lenette Grant

UNIVERSITY OF WAIKATO

DEPARTMENT OF MATHEMATICS

By the time you read this column, we would have held the Mathematics Colloquium and are probably trying to recover from the effects of running it.

Recently, the book "Automorphic Forms and L-Functions for the Group GL(n,R)" by Dorian Goldfeld of Columbia University was published by Cambridge University Press as Number 99 in the Cambridge Studies in Advanced Mathematics series. This book contains an appendix by Kevin Broughan. Concerning this book, Kevin writes:

"Dorian Goldfeld had the idea of writing a book on 'GL(n)' which was very explicit and used the real field rather than the adels and padics. I had attended his graduate class at Columbia while there on study leave on several occasions and he invited me to write software in Mathematica, called GL(n)pack, to accompany the book. The manual for the software is included as an appendix. Information about the book and software can be obtained by going to my home page at

http://www.math.waikato.ac.nz/~kab

It is believed that L-functions associated to automorphic forms on GL(n) encode all classical number theoretic information. The book sets out this theory in a clear and comprehensive manner, with a minimum number of new definitions. Many new theorems are included, accounting for the 4 years and 498 pages of text (and many happy trips to New York on my part) that it took to complete the work.

Parts of GL(n)pack provided significant challenges to write also. These included new algorithms for computing Casimir operators, Whittaker functions and Kloosterman sums on GL(n,R)."

We currently have Jonathan Kress from the University of South Wales visiting us. He came over in mid-September and will be here until mid-December. Jonathan is working with Ernie Kalnins. In early October, James Lyness from Argonne National Laboratory visited Stephen Joe for a week. Another visitor around that time was Yuri Litvinenko from the University of New Hampshire who visited Ian Craig for three weeks. With such a number of visitors all here at the same time, there was a scramble for office space.

Tim Stokes is currently on study leave and will spend some time over in Australia. In fact, he's just come back from a week in Australia where he attended the 24th Victorian Algebra Conference at Deakin University. After the Colloquium, Larry Forbes from the University of Tasmania, Graeme Hocking from Murdoch University, and Marcel Jackson from La Trobe University worked with Tim for several days.

Rua spent a week in November visiting the University of New South Wales. Another traveller was Stephen's PhD student, Vasile Sinescu who went to conferences in Germany and Romania in the August-September period.

Stephen Joe

VICTORIA UNIVERSITY OF WELLINGTON

School of Mathematics, Statistics and Computer Science, *Te Kura Tatau*

A former graduate of our maths and stats groups, Dr Al Merrifield, returned from University of Melbourne (where he has recently completed a postdoctoral fellowship) to give a seminar on "An investigation of mathematical models for animal group movement, using classical and statistical approaches".

An NZIMA post-graduate scholarship was awarded to Robin Averill to complete her PhD on Caring in the Mathematics Classroom. Robin has also recently had 2 papers (co-authored with her supervisor Megan Clark) accepted for publication.

The Operations Research team were well represented at the ORSNZ conference at the University of Canterbury (30 Nov-1 Dec) with Stefanka Chukova, Mark Johnston, and honours students Sarah Marshall and Bronwyn Erasmuson, all giving talks.

Rod Downey gave an invited lecture at the conference "Computability and Complexity in Analysis" in Gainesville Florida.

Congratulations to Catherine McCartin who received the Hatherton Award for work emanating from her PhD here at Victoria on Parameterized Counting Complexity. (Catherine is a senior Lecturer at Massey University's Institute of Information Sciences and Technology.)

Antonio Montalban is here for a year long Postdoc working with Rod Downey on computability and randomness. Antonio is a Dixon instructor at the University of Chicago and - like our earlier postdoc Hirschfeldt - won the Sacks prize for the best PhD in logic worldwide for his dissertation.

Matt Visser, has been awarded a Marsden Grant for $457,011 over three years, to investigate analogue models of curved space time. Mathematicians and physicists are beginning to think about

'acoustic black holes'; the team will look for other possible analogues, extend them until they 'break', and look beyond traditional mathematical framework for Einstein's general relativity. In developing these analogue space times, they believe may find a back door approach to 'quantum gravity'.

Mark McGuinness is again visiting the Division of Applied Mathematics in the Korea Advanced Institute of Science and Technology. Mark was a plenary speaker at the Korean Society for Industrial and Applied Mathematics meeting in Seoul early in December, where he spoke about "The Platelet Puzzle in Antarctic Sea Ice" to a largely Korean audience. He also had the opportunity to attend many talks spanning the gamut of Korean applied maths, all delivered in Korean!

Seminars

Jon A. Wellner (Professor of Statistics, University of Washington), "Estimation and Testing with Interval-Censored Data"

Gary Haggard (Bucknell University), "Computing Tutte Polynomials"

Estate Khmaladze , "Detection of spatial changes - the change-set problem of statistics"

R. P. Suresh (Visiting Professor, Victoria Management School), "Inference problems related to change-point in a hazard rate"

Alex Nielsen (Canterbury University), "Evolving Black holes and the Growth of Horizons"

Thomas Yee (University of Auckland), "A Framework for Regression"

Dr Yde Venema (Institute for Logic, Language and Computation, University of Amsterdam), "MacNeille Completions of Lattice Expansions"

Thomas Forster (Cambridge, England), "Deterministic and Nondeterministic Strategies for Hintikka games in First-order and Branching-quantifier logic"

Jin Seo Cho , "Directionally differentiable econimetric models"

Dr Volf Frishling (National Australia Bank), "On methodology and current projects in quantitative analysis at NAB"

Willemijn Vermaat , "Questions require an answer: A deductive perspective on questions and answers"

Nanny Wermuth (Chalmers/Gothenburg University, Sweden), "Partial inversion and partial closure of paths in graphs: two matrix operators to study properties of multivariate dependencies"

Alistair Merrifield (University of Melbourne), "An investigation of mathematical models for animal group movement, using classical and statistical approaches"

Rowan & Mark

WSG news

The Wellington Statistics Group (WSG), a local group of the New Zealand Statistical Association, continues to meet regularly. The WSG Convenor, John Haywood, left Wellington in early December to spend a year as a Visiting Scholar at the UCLA Department of Statistics. David Harte, from Statistics Research Associates Ltd, has taken over as the new Convenor of WSG. The WSG Treasurer, Alistair Gray, will also be stepping down in the near future. John and Alistair together made up the inaugural WSG Committee in August 2001 and since then there have been more than forty successful and enjoyable WSG meetings.

The Group receives regular sponsorship from the Ministry of Social Development, Statistics New Zealand, Statistics Research Associates Ltd, and Victoria University of Wellington. Recent WSG talks were given by Dimitar Christozov (American University in Bulgaria) and Stefanka Chukova (Victoria University of Wellington), "Estimation of the mean cumulative function from automotive warranty data: a stratification approach"; Len Cook, Former NZ Government Statistician (1992-2000) and Head of the UK Office for National Statistics, the Registrar General of England and Wales, and the first UK National Statistician (2000-2005), "What might official statistics in the Antipodes learn from the British statistical system, and vice versa?"; Estate Khmaladze, Victoria University of Wellington, "On distributions that do not follow asymptotic theory and other anomalies"; and Nanny Wermuth, Chalmers/Gothenburg University, Sweden, "Distortions of effects".

John Haywood

In Memoriam
Stephen White

1950 to 2006

Stephen White was one of New Zealand's leading geothermal modellers, with an international reputation. His main research areas concerned applications to geothermal energy, and to the underground storage of greenhouse gases. Stephen's work has been published in over 100 articles, and applied widely in many geothermal fields throughout the world. Stephen's work has been published extensively in over 100 articles, and has been applied widely to many geothermal fields throughout the world. One unswerving passion in Stephen's life was his commitment to improving our knowledge of our environment.

Stephen Peter White was born in Nelson, New Zealand on 23 January, 1950. He graduated from Canterbury University in New Zealand, with a PhD in physics in 1976. Joining the New Zealand's Department of Scientific and Industrial Research (DSIR) in 1978, he began working on geothermal models in 1987. Most of Stephen's work since then has involved modelling transport in systems ranging from the nanometre to geological scales.

His first geothermal project was developing a model of the Kawerau Geothermal Field, New Zealand. He wrote his own computer program to simulate single-phase three-dimensional heat and fluid transport in a fractured reservoir. This was the first 3D model of a geothermal system developed by DSIR. It was also the beginning of Stephen's efforts to develop realistic models by utilising all the computational power that was available. This was to be a recurring theme through all his work.

He continued working on Kawerau until the present day, eventually migrating the model to MULKOM and then TOUGH2. Over the years he produced 12 reports on the system. Just before his death he finished preparing the evidence he was to present at an Environment Court appeal regarding Kawerau resource consents. This evidence, and the thoroughness with which it was prepared, was instrumental in the case being settled before the hearing. The work he undertook for the consent process was notable for its innovation linking the reservoir model to a subsidence model to estimate possible subsidence effects.

Stephen's next geothermal project was a series of papers, in conjunction with other members of the Applied Maths team, DSIR, on aspects of two-phase flow in geothermal reservoirs and flow in fractured porous media. One of Stephen's strengths was his ability to develop customised computer code specific to the problem under consideration.

Over the years Stephen's reputation and list of contacts grew, resulting in work on models of various systems in New Zealand (Rotokawa, Tauhara) and overseas (Kakkonda and Uenotai in Japan). He was a regular attendee at the World Geothermal Congress, New Zealand Geothermal Workshop and TOUGH Workshop.

In the early 1990's Stephen started working on reactive transport models. This was pioneering work incorporating geochemistry into reservoir simulation models, and was perhaps his key scientific contribution. The main focus of this work was the development of ChemTOUGH2, an extension of the TOUGH2 reservoir simulator, which simulates the transport and reactions of water, heat and many chemical species. Applications of the work to geothermal systems included using chemical signatures to calibrate reservoir models; calculating deposition of silica; looking at changes in mineralization resulting from magmatic intrusions; and incorporating chemistry into a wellbore simulator. An important application of ChemTOUGH2 was to the problem of sequestering greenhouse gases in underground reservoirs. By using ChemTOUGH2 Stephen was able to predict CO2-rock interactions and predict levels of sequestration.

This research on reactive transport led to his being invited to Japan in 1995 as a Jistec Fellow at the Tohoku National Industrial Research Institute, Sendai, and the US in 1997 as a Research Scholar at Lawrence Berkeley National Laboratory. Between 1999 and 2003 Stephen was a Principal Investigator on a US Department of Energy funded study into natural CO2 reservoirs.

In 2000, Stephen began working on his most challenging geothermal model — that of the Luise geothermal system on the Papua New Guinea island of Lihir, where an open pit goldmine is being dug into the geothermal system. The greatest challenges in the model are dealing with the changing ground surface as the pit is dug and the operational requirements of obtaining pressures on a 10m scale. Again this was an example of Stephen utilising all the computation power available to him to develop a physically realistic model.

As well as geothermal modelling, Stephen worked on modelling problems in other fields, many involving chemical reactions and flow. One significant contribution was his work on pitting corrosion where he modelled the formation of micro-pits in stainless steel. This involved modelling the electrochemistry, metal dissolution and ion flow. Stephen's computer modelling revealed the process through which these micro-pits grow — direct measurements destroy the conditions required for pit growth. The moded used an adaptable finite element grid, to describe the evolving structure of the pit; solution of the electrical current flows, species migration and diffusion; all coupled to the strongly buffered chemical equilibria which hold between the chemical species in and about the pit. This model of pit growth also allowed a statistical model to be developed, involving multiple pits, and then a risk model to be developed which is presently used by corrosion engineers in their on-site inspections of large industrial plants.

This description is just a glimpse of Stephen's work on pitting corrosion. Bearing in mind the large number of research areas involved in this work gives some insight into the breadth of his work. He has made significant contributions to many research areas, several of them being of international standard, and in time some of Stephen's papers may become part of the folklore in these specialist areas.

Outside of work, part of Stephen's life was dominated by the rhythm of the seasons: over winter preparing his beloved Z class racing yacht Zephyrus for the coming summer competition and skiing on Mt Ruapehu; in summer racing Zephyrus on Paremata Harbour near Wellington; upgrading the Aorangi Ski Club lodge; fishing, tramping and canoeing with his family; painting his house before winter approached, but being frequently interrupted by the latest cricket broadcasts.

Some of the constants in Stephen's life were his deep love of his family; his commitment to his friends through his interests in badminton and the Toastmasters Club; his love of classic racing cars; growing roses, strawberries and new potatoes; brewing beer; drinking fine wine and creating and celebrating fine cuisine. He met his wife to be, Karen Garner, at the Applied Maths Division soon after he started working for DSIR in 1978, and they were married in 1980.

Stephen died suddenly and unexpectedly on September 17, 2006, which was a great shock to his many friends and colleagues throughout the world. Stephen loved life, especially the fine and natural aspects, he touched many people, enriched our lives, and provided an outstanding example of the best qualities of what it means to be human. The fundamental nature of Stephen's work, and his dedication to it, will be an inspiration to all his colleagues to continue to keep our heads raised and to focus on our aspirations, bearing in mind the need to treat our fellow travellers with dignity and compassion. There is a massive gap where Stephen once was, but our memory of him will remain an inspiration to us, in both our professional and private lives.

John Burnell and Graham Weir

Tertiary Teaching Excellence Awards

In 2001, the Government established annual awards for outstanding tertiary teachers. The awards aim to recognise and encourage excellence in tertiary teaching. They also provide an opportunity for teachers to further their careers and share good practice with others.

The selection process is undertaken by a Tertiary Teaching Awards Committee, appointed by the Minister of Education, and is supported by the New Zealand Qualifications Authority. The awards include 9 awards for 'Sustained Excellence', and the 'Prime Minister's Supreme Award', which was won in 2006 by Karl Dodds, Maths, Physics & Computing, Christchurch Polytechnic Institute of Technology. Karl has since been invited to Oxford University and will be speaking at several other institutions in the UK on the subject of "excellence" in teaching.

For more information on the awards, see the NZQA Website:
http://www.nzqa.govt.nz/for-providers/awards/ttea/

Prime Minister's Supreme Award - Karl Dodds

Karl Dodds is a principal academic staff member at Christchurch Polytechnic Institute of Technology (CPIT). He teaches physics, advanced mathematics and computer science (within 11 degrees and diplomas) across a wide range of levels to a diverse range of students. He has been a course supervisor in both physics and mathematics and was head of school (School of Mathematics and Statistics) for many years. He is currently a lecturer, member of two academic board committees, and involved with the central Academic Division in the role of programme quality evaluator and internal academic auditor. Karl says that while he is not a 'blue skies' researcher, he is involved in many applied research projects and uses practical physics and electronics to foster learning, both nationally and within the Canterbury region (e.g. with Science Alive!). He has written software which has sold internationally and is a consultant to several Canterbury IT companies. He is also a published author and international JAVA consultant.

Karl's comments:

My disparate subject fields require distinct teaching and assessment strategies. I am constantly switching among teaching modes, each involving methodologies appropriate to that subject area and student group. Many of my students are older people retraining, or entering higher education later in life, and they bring a very different dimension to my teaching. Every adult student has a diverse and extensive spectrum of life experiences and so it is not uncommon for someone to know much more than I about a given aspect of a topic. This I regard as a wonderful opportunity. It not only serves to contextualise a topic but additionally, that student becomes a valuable resource to draw upon in class. We are then all enriched.

I love each of my subject areas with an indescribable passion. Physics is, in my highly biased view, a wonderful subject to teach. This entire planet is one huge physics lab and I encourage students to "do" physics 24 hours-a-day by simply observing the world around them and asking "why?" and "how?". Advanced mathematics has an elegance and beauty which only those who "speak the language" can appreciate. Finally, computing, being an ever- changing subject, keeps me on my toes and commercially up-to-date. My research interests are an amalgam of all three subjects, which is ultimately the icing on the cake. What a great job I have!

I am not a trained teacher although I have, over the years, managed to grasp the principles of teaching and learning. But are these skills enough to make an "excellent" teacher? I believe not. Teaching is much, much more than a quantifiable list of actions and behaviours. Perhaps it is impossible to quantify at all? The "magic" component is an x-factor; something about which the teacher is not consciously aware and yet the student is drawn towards like a magnet. In the words of psychologist Dr. Phil McGraw:

> "Sometimes, things just are what they are."

It is not the big things that distinguish "good" and "excellent" teaching. It is the myriad of little things that make the greatest difference to student learning and consequent student success. It is caring personal attention during class time. It is helping with CVs and interview techniques. It is giving advice on personal problems, as appropriate. It is doing my bit to ensure that the students' time at CPIT is the best that it can be, including being available after they leave.

When I first started teaching, I thought that there was a 1:1 causal relationship between teaching and learning, namely that effective teaching inevitably produces effective learning. However there is another factor interaction which alters this relationship. A teacher can be popular and generally teach very well, but is the learning truly effective? The intervention of teaching within a student's learning framework actually interrupts their learning. It ends up either being a constructive or destructive imposition.

There are other factors which are important in nurturing the fragile learning process. The student environment is critical. Are there personal issues about which I ought to be aware? Can everyone "see" the demonstrations/board clearly? Is the lab/study group student mix appropriate? All of these seemingly simple things dramatically affect the student's learning.

There are a few simple rules which set a good foundation for student learning:

Rule 1: Be consistent	Keep the teaching style the same for a given class. Give the same amount of time and same class "rules" to all students.
Rule 2: Be credible	Have status; commercially, academically and educationally.
Rule 3: Test everything	Make sure that demos work, computer code works, exercises work, teaching and assessment strategies work.
Rule 4: Be available	Students must be able to get help when needed. An open door, no appointment necessary' policy is the best.
Rule 5: Target correctly	Choose a teaching methodology and corresponding assessment methodology which are appropriate to each subject and level of students.
Rule 6: Create curiosity	Where there is curiosity there is a willingness to seek more information and learning is more likely to happen.
Rule 7: Have fun	This is the best part of learning via good teaching. It breeds enthusiasm and injects life into a subject.

I rarely use lecture notes. A comprehensive knowledge of one's subject material is pivotal to being perceived as credible. Another aspect of my teaching is that I respond to all student phone calls or emails the same day I receive them and return all assessments by the following session. This maintains the continuity and momentum of learning. Feedback to each and every student about their current progress and likelihood of success must be provided very regularly. Adult students want to know how to learn and how to pass their courses. It is my job to ensure that this happens in a supportive, constructive manner.
I teach students how to research and reference material as well as study and prepare for exams. Many of these skills are new to adult learners. My classroom style is that of providing a full and complete service to the learner.

Most importantly, I acknowledge that do not know everything. Sometimes I cannot answer a student question as fully as I would like. I will gladly admit to the student or class that "I don't know". Since we are all engaged in an ongoing learning process, we can strive to find the answer together. Students always appreciate and respect honesty, which is part of the integrity expected of an excellent teacher.
My involvement with the CPIT's Academic Division, and my understanding of programme quality requirements and standards, has allowed my teaching to be more effective. Student learning and the teaching institution are at risk if teaching is operating outside of the regulations pertaining to a programme. My in-depth knowledge of CPIT systems, regulations and procedures, along with an awareness of various regulatory bodies, means that I can place my teaching into context and, most importantly, guarantee that my assessment and student management is always orchestrated according to the rules and regulations.

I have coined a wee phrase:

"Collective excellence is highly contagious."

My success in receiving this award squarely stands upon the shoulders of my equally talented colleagues. Being in the presence of marvellous educators is itself truly inspirational and we ultimately grow as result of sharing our experience.

My teaching style is a work in progress and has not yet finished evolving. There are additional pressures to develop yet more on-line delivery and distance courses. Regardless of what future teaching methodologies emerge, the only important questions are:
"Is learning actually occurring and if so, how well?"
and,
"Have I altered the way the student thinks? Can they challenge their beliefs or robustly defend them?"

A closing statement

Tertiary teaching for me has many rewards
It is in the faces of my beaming students, eager to explore and learn. It is in sharing the joy of my students as they successfully complete their courses or programmes of study. It is in seeing them gainfully employed in the career of their dreams. It is in having students call past my office years later just to say "thanks Karl". I am staggered not by my own teaching ability but rather, the learning ability of my students.
I reflect upon my teaching career and think of the tremendously talented staff with whom I work (or have worked) and my enlightened employer CPIT who not only allows, but encourages me to maintain a broad teaching portfolio and range of research activities. I often think of my own education and the special school teachers and university lecturers whose teaching excellence has been a model for my own teaching. Most importantly, I reflect upon the thousands of students who have been a delight to teach and who are now productive members of New Zealand society.

"We are what we repeatedly do. Excellence, therefore, is not an act but a habit."
-Aristotle (384-322 BC) Greek philosopher, scientist and teacher

BOOK REVIEWS

Please indicate your willingness to review new books, to the Review Sub-Editor Bruce van Brunt, at B.vanBrunt@massey.ac.nz. Bruce will then organise for you to receive a complimentary copy for reviewing.

Richard S. Varga, **Geršgorin and His Circles**, Springer-Verlag, Berlin, 2004, 226 pages. ISBN 3-540-21100-4.

Semyon Aronovich Geršgorin was born on 1901 August 24 at Pruzhany, which is now part of Belarus. He studied at the Petrograd Technological Institute, and in 1930 he became a Professor at the Leningrad Machine-Construction Institute. He published 11 mathematical papers before he died in Leningrad on 1933 May 30 at the age of 31, and an obituary article declared that "S. A. Geršgorin's death is a great and irreplaceable loss to Soviet Science".

Three of Geršgorin's papers have had lasting influence. In 1927 he founded the study of the convergence of finite-difference approximations to the solution of Laplace-type equations, and his paper on numerical construction of conformal maps was published posthumously in 1933. And his 1931 paper "Über die Abgrenzung der Eigenwerte einer Matrix" was a major advance in the study of matrix eigenvalues. That seminal paper (in German) is reproduced here in Appendix A, pages 193–198.

The computation of all the eigenvalues of a general complex square matrix is a highly non-trivial problem, even with high-quality software and fast computers. Geršgorin devised very simple methods by which, for a general complex square matrix $\mathbf{A}$ of order n, a region can be constructed in the complex plane which contains all n eigenvalues of $\mathbf{A}$. For $i = 1,\ 2,\ \ldots,\ n$, define the i-th deleted row sum of $\mathbf{A}$ as $r_i(\mathbf{A}) = \sum_{j=1}^{n}{}' |a_{i,j}|$, where the dash indicates that the diagonal element (with $j = i$) is omitted. The circle in the complex plane which is centred at $a_{i,i}$ with radius $r_i(\mathbf{A})$ is called the i-th Geršgorin circle, and that circle with its interior is called the i-th Geršgorin disk $\Gamma_i(\mathbf{A})$. The union $\Gamma(\mathbf{A})$ of those n Geršgorin disks is called the Geršgorin set of $\mathbf{A}$.

Geršgorin gave a very simple proof that every eigenvalue of $\mathbf{A}$ is in $\Gamma(\mathbf{A})$.

If $\mathbf{X}$ is any nonsingular square matrix of order n then the matrix $\mathbf{B} = \mathbf{X}^{-1}\mathbf{A}\mathbf{X}$ is similar to $\mathbf{A}$, with the same Jordan Canonical Form as $\mathbf{A}$. Geršgorin advocated using a diagonal matrix $\mathbf{X}$ with positive diagonal elements, in which case the similarity transformation reduces to scaling rows and columns of $\mathbf{A}$ to get a matrix $\mathbf{B}$ with the same eigenvalues — for a suitably chosen diagonal matrix $\mathbf{X}$ the Geršgorin set $\Gamma(\mathbf{B})$ can be smaller than $\Gamma(\mathbf{A})$. Geršgorin also proved that if r Geršgorin disks are disjoint from the other $n-r$ Geršgorin disks (where $0 < r < n$), then the union of those r Geršgorin disks contains exactly r eigenvalues of $\mathbf{A}$. In particular, any isolated Geršgorin disk $\Gamma_i(\mathbf{A})$ contains exactly 1 eigenvalue λ_i. Geršgorin explained that row i of $\mathbf{A}$ can be scaled by a factor $s < 1$ with column i getting scaled by $1/s$, so that the radius $r_i(\mathbf{A})$ of $\Gamma_i(\mathbf{A})$ gets reduced by the factor s and its centre $a_{i,i}$ remains unchanged — but the radii of some other Geršgorin disks then expand. As s gets reduced the reduced version of $\Gamma_i(\mathbf{A})$ remains isolateduntil s reaches some value t, for which one or more of the expanded disks intersects the reduced version of $\Gamma_i(\mathbf{A})$; but for each $s > t$ the reduced version of $\Gamma_i(\mathbf{A})$ remains isolated, and hence that reduced disk gives a refined estimate of λ_i.

When considering the eigenvalues of $\mathbf{A}$ its Geršgorin set is a useful aid to understanding, and in many cases Geršgorin's simple refined estimate of λ gives adequate accuracy.

Olga Taussky-Todd and her husband John Todd enthusiastically applied and extended Geršgorin's work, and they have been followed by many others, including F. L. Bauer, A. Brauer, R. Brualdi, K. Fan, A. J. Hoffman, A. M. Ostrowski, F. Robert and R. S. Varga. Also, J. H. Wilkinson (not mentioned here) in his work on numerical linear algebra made important use of Geršgorin's work.

Despite the widespread interest in Geršgorin's publications, no account of him was published outside the Soviet Union until 1998, when a German article by S. Fujino & J. Fischer "Über S. A. Gerschgorin" was published (*GAMM-Mitteilungen*, Heft 1, 749-754), and then my article "Semyon Aronovich Gershgorin" was published (*IMAGE* **32**, April 2004, 2–5).

Olga Taussky-Todd died on 1995 October 7. The author dedicates this book affectionately to his mentors Olga Taussky-Todd and John Todd, with a watercolour portrait of them.

In the Preface, Varga explains that a major recurring theme in this book "is that a nonsingularity theorem for a matrix gives rise to an equivalent eigenvalue inclusion set in the complex plane, and

conversely. Though common knowledge today, this was not widely recognized until many years after Geršgorin's paper appeared. ..... The second recurring theme in the book is the decisive role that M-matrices and H-matrices, and the related Perron-Frobenius theory of non-negative matrices, play throughout this book. A much lesser recurring theme in this book is the observation that there have been surprisingly many published results in this area which contain major errors".

A. Brauer constructed a subset of the Geršgorin set which contains all eigenvalues of $\mathbf{A}$. That Brauer set $\mathcal{K}(\mathbf{A})$ is defined in terms of the same n complex numbers $a_{i,i}$ and the same n non-negative real numbers $r_i(\mathbf{A})$ which determine the Geršgorin set. For each $1 \leq i < j \leq n$, define the $(i-j)$-th Brauer Cassini oval $K_{i,j}(\mathbf{A})$ as the set of complex z such that $|z - a_{i,i}| \cdot |z - a_{j,j}| \leq r_i(\mathbf{A}) \cdot r_j(\mathbf{A})$. The Brauer set $\mathcal{K}(\mathbf{A})$ is the union of those $n(n-1)/2$ Brauer Cassini ovals $K_{i,j}(\mathbf{A})$ (p.36).

Varga has not explained the origin of the term "Cassini ovals". Giovanni Domenico Cassini (1625-1712) founded the Cassini dynasty of astronomers. He rejected Kepler's elliptical orbits for the planets, and replaced them by curves of the form $|z-1| \cdot |z+1| = r^2$ (with the reference points taken as 1 and -1). For $r = 0$ the curve reduces to the 2 points $z = 1$ and $z = -1$, for $0 < r < 1$ the curve consists of two closed convex curves, for $r = 1$ the curve is a lemniscate of the form ∞, and for $r > 1$ the curve is a closed curve, which is convex if $r \geq \sqrt{2}$. Thus, each of the Brauer Cassini ovals is more complicated than a Geršgorin disk, and there are $n(n-1)/2$ ovals instead of the n Geršgorin circles.

Varga discusses many other constructions of regions containing all eigenvalues of $\mathbf{A}$, which are simpler than computing all eigenvalues but more complicated than the Geršgorin set. He points out that with the Brualdi lemniscate method applied to a 10×10 complex matrix $\mathbf{A}$, all of whose off–diagonal entries are nonzero, "determining the Brualdi set $\mathcal{B}(\mathbf{A})$ would require finding 1,112,073 Brualdi lemniscates, a daunting task for a 10×10 matrix!" (p.55).

This book does not mention the important case of Hermitian matrices (including real symmetric matrices), for which the Geršgorin disks reduce to intervals on the real line.

In Figure 1.2, the 3 crosses representing eigenvalues of a matrix A_2 are each misplaced, with the eigenvalue $6{\cdot}9718 - 0{\cdot}0008i$ being indicated *above* the real axis. Otherwise there are very few misprints, with the only significant one being "Geršgroin" (p.125).

In the Preface, Varga announces his intention to write a second volume, dealing with more advanced topics.

For anyone concerned with localizing eigenvalues, Varga's book (or books) will be an essential text.

Garry J. Tee, University of Auckland

CONFERENCES

NZMS Travel Grantee Reports

Amanda Elvin (Massey University, Albany)

In August, I attended the inaugural Queensland Brain Institute Workshop on Mathematical and Computational Neuroscience in Brisbane, with my supervisor Carlo Laing. The conference was held at the St Lucia golf course by Queensland University which was a very pleasant environment to be in - Queensland winters are a lot warmer than Auckland winters! The two day program consisted of talks by invited speakers, who included some of the top researchers in the field, and a poster session for all attendees.

The talks were very interesting and thought provoking. It was fascinating to meet Professor Shun-ichi Amari, Director of the Riken Brain Science Institute in Japan, who in 1977 wrote a paper introducing the neural field model my research is based upon. Another invited speaker was Professor Peter Dayan, from the Gatsby Computational Neuroscience Unit at the University College London who, with Larry Abbott, wrote the excellent textbook Theoretical Neuroscience, widely used in computational and mathematical neuroscience. A great advantage of presenting a poster on my work was the input received from the conference participants which is very useful as I begin the second half of my doctoral thesis. My thanks to NZMS for the contribution to my conference expenses.

Hannes Diener (University of Canterbury)

From the 19th to the 23rd of June of this year the NZMS generously supported my attendance at the conference "Trends in Constructive Mathematics", held in Frauenwoerth, Germany. One occasion for the conference was Douglas Bridges' 60th birthday. I was invited to give a talk, which gave me the possibility to present recent work on compactness that is a spin off from the work for my PhD thesis. Moreover it was the first time for me to meet most of the experts in the field and therefore yielded many new contacts and new ideas. It was a very constructive meeting in both possible meanings.
The venue chosen for the conference, was a Benedictine nunnery built in the 9th century located on a tiny island in Bavaria's biggest lake, which itself is situated very scenically right at the edge of the European Alps. And even for one who is spoiled by New Zealand scenery it was a spectacular setting. The icing on the cake was the soccer world cup which was held at the same time as the conference and which provided a non mathematical, but also enjoyable pastime for the evenings.

Vasile Sinescu (University of Waikato, Hamilton)

Monte-Carlo and quasi-Monte Carlo methods in Scientific Computing (MCQMC), Ulm, Germany, 14–18 August 2006.

International Conference in Applied Analysis and Differential Equations (ICAADE), Iasi, Romania, 4–9 September 2006.

The MCQMC conference is held every two years and brings together experts in the fields of mathematics, computer science, statistics, finance, operations research, biology, chemistry, physics, graphics, and engineering to discuss the latest developments in Monte Carlo and quasi-Monte Carlo methods and their applications. This year, the conference was hosted by the University of Ulm, Germany. From my point a view, I am very happy that during the conference, I met the majority of the researchers working on quasi-Monte Carlo methods for numerical multiple integration (too many to be listed here !) and had plenty of useful talks with them. I gave a talk regarding some of my recent results obtained on the construction of rank-1 lattice rules, which was very well received. As an aside, I would like to mention that the city of Ulm is Albert Einstein's birthplace and overall, the whole region of Southern Germany is rich of numerous tourist attractions.

The ICAADE conference was hosted by the Faculty of Mathematics of "Alexandru Ioan Cuza" University of Iasi, Romania. Here I gave another talk, this time on the construction of intermediate-rank lattice rules for numerical multiple integration. The city of Iasi is a major cultural city and is also the

place where I completed my studies prior to coming to New Zealand. Thus, the ICAADE conference also gave me an excellent opportunity to revisit some places and talk to former colleagues.

There were more than 100 contributed talks at each conference with participants from all over the world. Each conference will publish refereed conference proceedings and I am currently working on preparing the corresponding manuscripts.

Finally, I am grateful to the Department of Mathematics of the Waikato University and to the New Zealand Mathematical Society for the financial assistance that allowed me to participate at these conferences.

ICM2006

Summary of the International Congress of Mathematicians ICM2006 held in Madrid, August 22nd -30th.

Before the conference began, my wife and I joined a Conference Tour to Seville and Granada. This was an absolute delight, especially for anyone interested in Moorish culture, knot theory or automorphic forms! It also meant we were able to meet and get to know a group of mathematicians and their partners in a relaxed atmosphere.

The congress site, IFEMA, was a large conference centre spread over 5 floors of one building. Lots of rooms of varying sizes, space for computers, exhibitors, poster sessions, galleries and displays and close to several hotels and the airport. Being away from the city centre was not so attractive however, but some law of nature applies to these events, making perfection elusive.

The pre-conference administration was poor, with tardy or non-existent replies to emails from the organizers. Language was a factor, given the small general demand for english in Spain. However everything related to our experience came right in the end, and the net result was a superb mathematical experience.

Fields medals: These were awarded at the opening ceremony by the King of Spain to Terrence Tao "for contributions to partial differential equations, combinatorics, harmonic analysis and number theory" (the Mathematical Mozart!), Andrei Okaunkov "for contributions bridging probability, representation theory and geometry", Grigory Perelman "for contributions to geometry and his revolutionary insights into the analytical and geometric structure of the Ricci flow" (he turned down the Medal however generating huge publicity), and Wendelin Werner "for contributions to the development of stochastic Loewner evolution, the geometry of 2D Brownian motion, and conformal field theory". The Nevanlinna prize went to Jon Kleinberg and Gauss prize to Kiyosi Ito.

An extensive effort was made to bring graduate students to the congress, especially those from developing nations. A pre-conference meeting was held at Cordoba, the classical city where east meets west, and a panel discussion "Mathematics for Peace and Development", chaired by Mary Gray (chair of the AMS committee on human rights) held as part of the scheduled sessions.

Popularization of mathematics was a big theme, and this too was given time and space with a panel discussion. Presenting at this were two mathematicians well known to some Kiwi mathematicians, Philipe Tondeur and Marcus du Sautoy. The latter spent some time with the large publicity team supporting the congress, generating much of the press coverage you would have spotted in the popular media.

This was an interesting and very wide ranging mathematical event this brief summary hardly does it justice. Most of our subject leaders were there and a big effort was made to have invited lectures accessible to a general mathematical audience. This policy will continue, making the meeting well worth going to for any professional mathematician or graduate student. Rod Downey gave an invited lecture and I presented a contributed paper. Together with Gaven Martin, we made up the entire NZ based contingent. The next ICM is to be held in Hyderabad India in 2010.

Kevin Broughan

SIMASP Conference, Queenstown, November 2006

Most New Zealanders try to avoid spending time in Queenstown - too many tourists, unfriendly locals and Shania Twain (who if she is a regular reader of this newsletter hopefully will forgive us). In spite of this, 26 postgraduate students and staff members from the Universities of Canterbury and Otago converged on Queenstown for the inaugural SIMaSP conference held over three days in November.

The SIMaSP (South Island Mathematics and Statistics Postgraduate) conference provided a unique opportunity for us to meet our fellow South Island postgraduates and gain an appreciation of each other's work. The talks reflected the broad range of studies that can be undertaken in mathematics including matroids, modelling downhill skiing, teaching mathematics and frontal lobotomies. The award for the best student talk (courtesy of the NZMS and Prof. Gaven Martin) was presented to Nicole Kleinstreuer for her talk on modelling what she claims is the most important organ - the kidney.

Queenstown was an ideal setting for SIMaSP with the views from the lofty heights of the conference room at the Rydges providing ample distraction during the ... breaks between talks. Contrary to expectations the locals weren't unfriendly either except of course for the vicious magpie that attacked poor Mike Plank (which he claims was a Haast eagle).

It was common agreement that the conference was hugely successful, providing participants with a chance to present their work in a friendly setting and creating useful connections between students. The conference was inspired by John Hannah and Derek Holton who delegated its organisation to Alex James who in turn convinced two PhD students Scott Graybill and Daniel Lond that it would be good for them to organise a conference! Scott and Daniel did a superb job organising everything and deserve to be congratulated. Hopefully they will now have enough time to continue working on their PhDs. Thanks also go to Julie Daly for motherly supervision.

This conference could not have taken place without the financial support of both departments mentioned and the NZMS. Speaking for all participants we would like to extend our warm felt thanks to them. Funding permitting we look forward to another captivating conference next year!

Klaas Hartmann and Hannes Diener

Conferences Coming Up

January 8–13, 2007, Bay of Islands, New Zealand: **NZMRI Summer Workshop on Partial Differential Equations: Analysis, Applications and Inverse Problems**.
website: http://www.math.auckland.ac.nz/~fox/SummerWorkshop.html

January 29–February 2, 2007, Macombo Hotel, Nadi, Fiji: **Second South Pacific Conference on Mathematics (SPCM07)**.
website: http://www.riemann.usp.ac.fj/~spcm07/

28 Jan–1 Feb 2007, The Esplanade Hotel, Fremantle, Western Australia: **ANZIAM 2007 (annual meeting for Australian and New Zealand Industrial and Applied Mathematics)**
email: Duncan Farrow
d.farrow@murdoch.edu.au
website: http://www.anziam07.murdoch.edu.au/

February 5–9, 2007, University of Wollongong, Wollongong, Australia: **MISG2007 (Mathematics and Statistics in Industry Study Group)**.
Accommodation costs for New Zealand students will be paid for by AMSI. There is also some NZMS financial support for students to attend MISG2007
website: http://www.misg.math.uow.edu.au/

April 16–20, 2007, Heritage Hanmer Springs, Hanmer Springs, New Zealand: **Workshop on Modelling Invasive Species and Weed Impact**.
email: Jennifer Brown or Alex James
J.Brown@math.canterbury.ac.nz or A.James@math.canterbury.ac.nz
website: http://www.math.canterbury.ac.nz/bio/NZIMA/

2–5 July 2007, Lake District, UK: **Workshop on Applications of Mathematics in the Geosciences**.
The workshop will take a similar form to the study group meetings which have been used successfully in the U.K. and throughout the world for many years to initiate research into problems arising in industry and, more recently, medicine. This will be the first time this format has been used in the geosciences. The workshop is supported by a grant from the EPSRC. In the proposal to EPSRC, we identified three particular scientific areas that might be suitable for such a workshop. These are: the study of grounding line location and the issue of marine ice sheet instability; bioremediation in contaminated groundwater; sediment transport and fluvial morphogenesis in geomorphology. Please contact Andrew Fowler, Oxford Uni fowler@ maths.ox.ac.uk for further information.

NOTICES

Minutes of the 32nd Annual General Meeting

slightly abridged

5.10 pm - 6pm, Monday 4 December 2006, University of Waikato

Present: Gaven Martin(chair), Winston Sweatman, Robert McKibbin, Boris Baeumer, Stephen Joe, Shaun Cooper, Aroon Parshotam, David Wall, Rick Beatson, John Hannah, Igor Boglaev, Graeme Wake, Tammy Smith, Mick Roberts, Robert McLachlan, Graham Weir, Allison Heard, Jeff Hunter, John Butcher, Bill Barton, Peter Donelan, David Gauld, Kevin Broughan, Tim Stokes, Dennis McCaughan, Peter Fenton, Ernie Kalnins, Robert Aldred, Garry J. Tee.

1. **Apologies**

   Apologies were received from Rua Murray, Mark McGuinness, Michael Albert and Shaun Hendy.

2. **Minutes of 31st Annual General Meeting**

   The minutes of the 31st Annual General Meeting were accepted (moved David Gauld, Stephen Joe).

3. **President's report**

   The President presented his report. A number of issues arose which are covered in the items below.

   - **Forder Lecturer 2007**

     The President reported that he had been in correspondence with the London Mathematical Society, who wish the two societies to discuss and review the future of the Forder Lecturer series. The programme was discussed. The spread of the costs of this biennial event is split between the LMS (airfare), NZMS (local travel and weekends) and NZ departments (local expenses). It was observed out that the event gave the LMS a bridge to NZ mathematics. It was noted that this event differs from the usual research exchanges where a visitor tends to come to tackle a specific project and does not circulate all of the departments within New Zealand. The Forder Lecturer can be selected for their ability as public lecturers as well as their ability as researchers. There have been problems with finding speakers, and for the NZMS lecturer series too. It was suggested that the NZMS lecturer programme might be merged with the Forder lectureship to have just one such event every two years. A suggestion was made that the President write to former Forder lecturers to ask for their support. Also, he is to write back to the LMS strongly presenting the case for continuing the programme and stating its benefits to both societies.

   - Early Career award.

     The President presented the Council proposal for this new award: As initial criteria for eligibility the same rules could be used as for the Marsden fast start grants. Essentially, this means that applicants must be within seven years of confirmation of PhD with an allowance made for extenuating circumstances. The candidate would be judged on their three best papers and a two-page CV. They would have completed a significant part of their research within NZ. The awardee would also normally be a member of the NZMS.

     The proposal was discussed, in particular whether the criteria of membership of the NZMS should be stricter (requiring several years membership) or not present at all. It the end the council's compromise was accepted with a recognition of the need for a membership recruitment drive. It was noted that for the Marsden Fast Start Awards there would be typically ten to fifteen applicants in Mathematics/Statistics with one or two awards made.

     The motion to create this new award was passed (moved Gaven Martin, Tammy Smith).

   - NZ Journal of Mathematics

     David Gauld reported as chair of the NZJM committee. The journal, a joint production of the University of Auckland and the NZMS, has been expensive to produce and has room for only a few articles per year. Currently it is heavily subsidised by the University of Auckland and to a lesser extent by the NZMS. The possible future of the journal is under consideration. One

current suggestion is to convert the journal to an entirely electronic form which would save on printing costs and also allow a more flexible publication to reduce the backlog. This could be with free access. The journal would continue to run at a loss subsidised by New Zealand Departments and the NZMS. There was some discussion of what the relative shares of such a subsidy might be. It was observed that the NZJM was good for the NZMS but also that there were comparatively few NZ authors. The point was made that the journal is recognised for the PBRF and the quality of publication is similar to corresponding Australian ones. The suggestion was made that commercial support and sponsorship could be sought for the journal. The AGM expressed its continuing support for the journal and a willingness to possibly provide more money if necessary.

- Thanks

  The incoming and outgoing Newsletter Editors, Mark McGuinness and Robert McLachlan, were thanked for their efforts. Thanks were also recorded for the outgoing council members, Warren Moors and Michael Albert, and the outgoing vice president Mick Roberts. A vote of thanks was made to Stephen Joe for organising the Colloquium.

4. **Treasurer's report**

   Tammy Smith presented her report. She noted the great efforts by both the outgoing and incoming Newsletter editors who through advertising have covered their printing costs. Overall, there was a reduced expenditure this year as grants were lower and there was no NZMS Visiting Lecturer. However, Council had observed that there may be increased costs associated with the Colloquium next year. The treasurer's report was approved by the meeting (Gaven Martin, Winston Sweatman).

5. **Membership Secretary's report and annual subscriptions**

   Tammy Smith presented the membership report by John Shanks. It was noted that there was a continuing decline in members. There was no desire for an increase in subscriptions.

6. **Election of Councillors and Incoming Vice-President**

   (a) The term of office of councillors Warren Moors and Michael Albert ended and they stepped down as too did Mick Roberts who reached the end of his term as outgoing Vice President.

   (b) The following nominations were received

   Nominations for council:
   Kevin Broughan (University of Waikato) nominated Stephen Joe, seconded Tim Stokes
   Boris Baeumer (University of Otago) nominated Mick Roberts, seconded Winston Sweatman

   Nomination for incoming Vice President:
   Robert McLachlan (Massey University) nominated Gaven Martin, seconded Mick Roberts

   They were elected unopposed.

7. **Appointment of auditors**

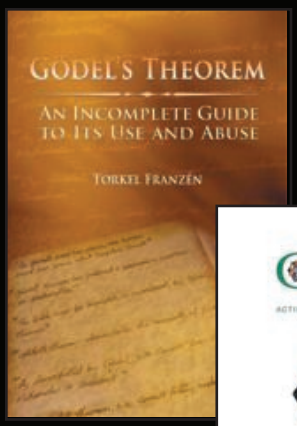
   It was moved (Tammy Smith, Mick Roberts) that the current auditors, McKenzie McPhail (4th Floor, Farmers Mutual House, 68, The Square, Palmerston North), be reappointed for another year. The motion was carried.

8. **NZMS Research award/medal and Early Career Award**

   The President encouraged members to make nominations for the NZMS Research award as there are usually not many nominations. He said that a decision had been reached on this year's award and that it would be presented in a day's time at the Colloquium Dinner.

   The President reported that a collaboration of the NZMS, NZ Statistical Association, NZIMA, NZMRI and Mathematical Sciences Committee of the RSNZ was in the process of negotiating a new medal for lifetime achievement in the mathematical sciences through the RSNZ. A formal proposal is likely to be made to the RSNZ at their March meeting. In light of these new development it was suggested that the idea of converting the NZMS Research Award to a medal should be shelved for the present and the meeting was in agreement with this.

When it comes to Mathematics



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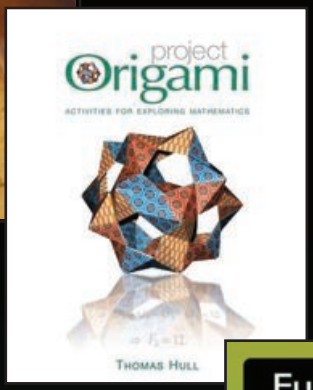

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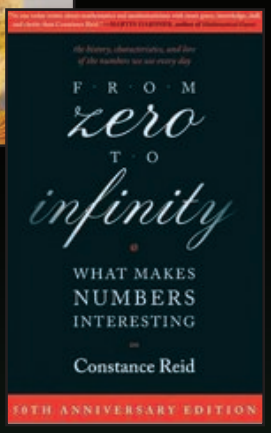

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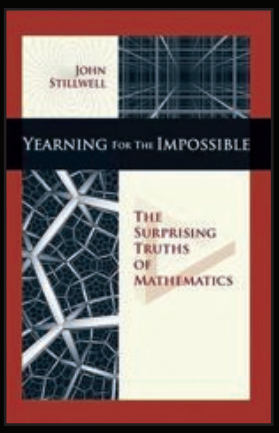

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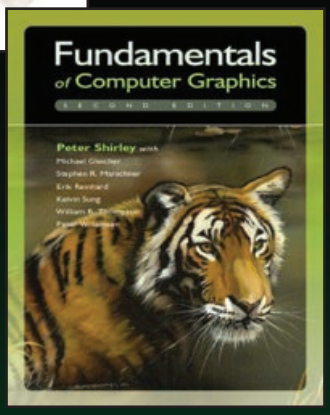

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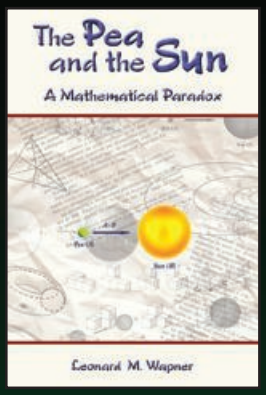

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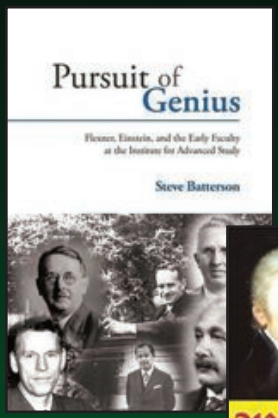

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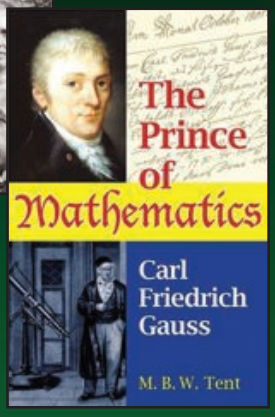

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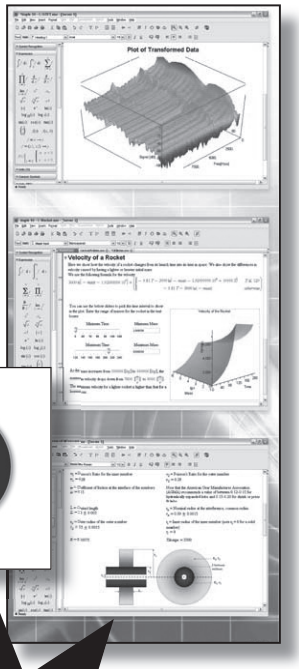

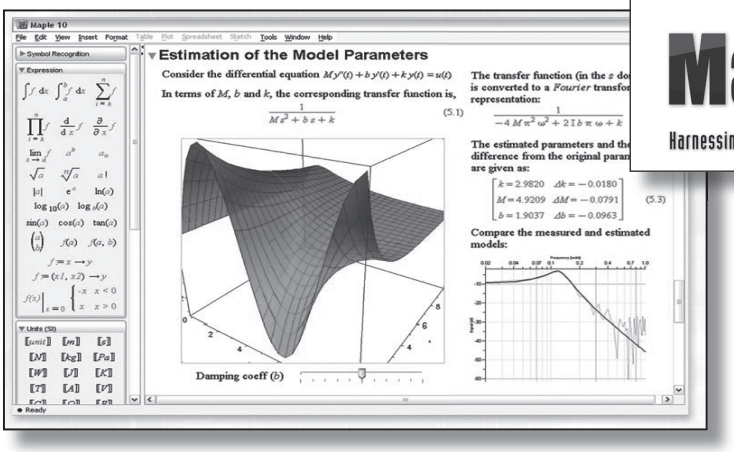

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