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NEWSLETTER

OF THE

NEW ZEALAND MATHEMATICAL SOCIETY

Contents

PUBLISHER'S NOTICE

This newsletter is the official organ of the New Zealand Mathematical Society Inc. This issue was edited by Mark McGuinness, assembled by Rowan M^{c}Caffery and printed at Victoria University of Wellington. The official address of the Society is:

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The newsletter is available at: http://IFS.massey.ac.nz/mathnews/NZMSnews.shtml
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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LOCAL NEWS

AGRESEARCH

The mathematical biologists at Ruakura attended the NZ Mathematics Colloquium en masse held at nearby Waikato University from 4–6 December 2006. Tanya Soboleva gave a talk titled "Modelling of trophic cascades: importance of rapid changes of traits".For the rest of us, it was a useful opportunity to catch up with the academic maths community and again marvel at the range of problems being studied.

Five of the Statistics group attended the Australasian GenStat/StatGen Conference at Victor Harbor, near Adelaide, in December. Peter Johnstone and Dave Saville occupied 67% of the second session, giving talks entitled respectively "Statistics, the Law and the Thieving Fishers" (a brilliant topic for a sweltering Aussie afternoon) and "Regression errors in x case study" (not heavy duty, but less mirth-generating...). Next morning, David Baird talked on (GenStat) "Workbooks and other spreadsheet enhancements" and Roger Littlejohn talked on "Hidden Markov models" (in case you can count, the fifth attendee was John Koolaard). That night, many of them went blue penguin spotting, and the following night visited a winery for the conference dinner. All in all, it was a good, well-organised conference at a good venue.

THE UNIVERSITY OF AUCKLAND

Department of Computer Science

Jim Goodman has been made a Fellow of IEEE.

Ian Warren, Jing Sun and Alexei Drummond have been promoted to Senior Lecturer. Emilia Mendes has gained accelerated promotion within the Senior Lecturer band.

At the Malaysian Software Engineering Conference MySEC 2006, Santokh Singh won the Best Paper Award. Also, he proposed the winning theme of "Excellence through Software Engineering and Innovation", which was chosen for the Malaysian Software Engineering Interest Group.

The Department has continued to improve on its successes at the ACM International Programming Contest with the student team coached by Dr Michael Dinneen winning a bronze medal. Only two other teams solved more problems at this year's competition in Tokyo. The team members were Andrew Olsen, Robert Bowmaker and Stephen Merriman. This team solved twice as many problems as the other two Australian teams from our South Pacific region at the ICPC finals (total of 88 teams at the finals selected from over 6000 teams who competed at regional contests). The University of Auckland team finished 11th from 88 teams in the world finals, only just behind teams from places like Shanghai Jiao Tong, St Petersburg State and Saratov State, all of whom have won the world finals in the last few years. They were well ahead of the teams from Australia, and also ahead of teams from places like CalTech, Harvard, Carnegie-Mellon, Stanford, Sharif (the best university in Iran, which usually finishes much higher than UoA). They were the third-ranked team (behind two Chinese ones) in the whole Asia-Pacific region. This is the best result achieved by a team from this university.

Dr Peter Gutmann gained international media attention for his detailed publication on "A Cost Analysis of Windows Vista Content Protection". Microsoft have been rebutting some of these points and are involved with debates with Peter on radio and in the papers.

Seminars

Prof. Peter Buneman , "Data provenance".

Neal Glew , "IISL: An ISA Specification Language for IA"

Craig Chambers , "Rhodium: a system for provably correct optimizations".

Garry J. Tee

Department of Mathematics

Ivan Reilly has been made an Officer of the NZ Order of Merit in the New Year Honours, for services to mathematics.

Jozef Siran was farewelled on March 2, and then he headed for the Open University in England, to become a Professor of Mathematics there.

Paul Bonnington ended his term as Associate Dean (Information Technology) on 2006 December 31. And the next day he took up a more central role at the University level, guiding the implementation of the UoA eResearch strategy in association with the newly-established eResearch Task Force. He received the Science Dean's Award for Teaching Excellence. Paul's BeSTGRID project has just been awarded another $500,000 to extend it through to Feb 2008. That project has already been used by Mike Steel (at the University of Canterbury) to give a lecture here.

David Bryant was an invited speaker at the Integrated Computational Biology conference in Korea in December 2006, and he has been awarded a Humboldt Fellowship.

Marston Conder has been invited to deliver 4 conference lectures this year: Lead lecture in special session on Automorphims of Curves, American Mathematical Society meeting, Tucson, in April; Plenary lecture, 6th Slovenian International Conference on Graph Theory, Bled (Slovenia), in June 2007; Plenary lecture, Com2MaC Conference on Applications of Group Theory to Combinatorics, Pohang (Korea), in July; Plenary lecture, First joint meeting of AMS and NZMS, Wellington, in December.

Sina Greenwood has been promoted from Lecturer to Senior Lecturer, Allison Heard has been promoted to Senior Tutor above the bar, and Philip Sharp has been promoted over the Senior Lecturer bar.

Eamonn O'Brien has been awarded a Visiting Fellowship by the LMS to cover costs for visits to the UK later this year, and he has been awarded a 1-month membership of the 2008 MSRI Program on "Representation Theory of Finite Groups".

Four new James Cook Research Fellowships have been announced by the Royal Society of New Zealand, which administers the Fund on behalf of the New Zealand Government. The Fellowships are for two years and are full-time positions. James Sneyd has gained a Fellowship, to continue research on "Modeling airway smooth muscle: from mathematics to asthma". And James has been re-elected to the University of Auckland Research Committee.

Tom ter Elst gave an invited lecture in November 2006 at the international "Conference on Heat Kernels in Mathematics and Physics", held at Blaubeuren in Germany.

Mike Thomas will be representing the New Zealand Vice-Chancellors Committee on the Ministry of Education CAS pilot project CAS Advisory Group.

Prof. John H. Conway (Princeton University) gave a public lecture here on January 25 about his "Game of Life", which was enthusiastically received.

Prof. Marcus du Sautoy (from Oxford University) is here as the 2007 MacLaurin Fellow. On March 15 he gave a public lecture here on "The music of the primes", with audience participation from around NZ, through Paul Bonnington's BESTGRID network.

Recent visitors include: Prof. Boris Altshuler (Columbia University), Prof. Vestislav Apostolov (University of Quebec at Montreal), Dr John Bray (Queen Mary, University of London), Prof. John H. Conway (Princeton University), Prof. Nira Dyn (Tel Aviv University), Prof Paul Gartside (University of Pittsburgh), Olivier Gascuel (Universite de Montpellier), Mile Gu (University of Queensland), Prof. Gerhard Hiss (RWTH Aachen), Dr Doojin Hong (Seoul National University), Prof. Jari Kaipio (University of Kuopio), Prof. Mamoru Kameko (University of Tsukuba), Prof. Carolyn Kieran (University of Quebec at Montreal), Dr Ville Kolehmainen (University of Kuopio), Dr Young Soo Kwon (Postech, Korea), Gideon Maschler (Emory University), Prof. Charles Leedham-Green (Queen Mary, University of London), Dr Susan McKay (Queen Mary, University of London), Prof. Pawel Nurowski (University of Warsaw), Dr Helmut Podhaisky (Halle University), A-Prof Dr Marzita Puteh (University Pendidikan Sultan Idris), Prof. Brian Raines (Baylor University, Texas), Prof. Uwe Semmelmann (University of Cologne), and Prof. Mike Steel (University of Canterbury).

The Devonport Topology Festival was held on February 16. The following talks were presented

Prof. Kevin Broughan (University of Waikato), "Vassiliev invariants for (proper and singular) knots".

Stephen Budden , "Quandle invariants and knots".

Prof. Marston Conder , "Some recent observations about the genus spectrum of regular maps on orientable surfaces".

Prof. Paul Gartside (University of Pittsburgh), "Hilbert's 13th".

Prof. David Gauld , "Combinatorics of irregularity".

Dr Brian Raines (Baylor University, Texas), "Applying topology to open problems in economics".

Prof. Ivan Reilly , "A covering characterization of strong quasi-metric spaces".

A Group Theory Workshop was held in the Department on February 22 and 23, with the following lectures:

Prof. Derek Holt (Warwick University), "Computing in matrix groups over finite fields".

Prof. Gerhard Hiss (Aachen), "On products of representations".

Prof. Peter Brooksbank (Bucknell), "Intersections of classical group".

Prof. Mike Newman (ANU), "Guides to prime-power groups".

Prof. Charles Leedham-Green (Queen Mary, London) "Computing with twisted groups of Lie type".

A-Prof. Jozef Siran , "Moebius regular maps".

Dr John Bray (Queen Mary, London), "Maximal subgroups of classical groups".

The 2006 New Zealand Mathematics Colloquium was held at the University of Waikato on December 4 to 6. Members of this Department contributed the following talks: A-Prof. Bill Barton, Pip Neville-Barton & Dr Jamie Sneddon, "If 'ifs' and 'ans' were pots and pans, we'd have a lot more thinkers: English second-language speakers learning undergraduate mathematics". Prof. John Butcher, "Order and stability of general linear methods". Dr Allison Heard, "Stability of adaptive numerical algorithms". Shawn A. Means, "Three-dimensional spatio-temporal dynamics in a cardiac cell". Prof. Boris Pavlov, "Boundary zero-range perturbation for biharmonic equation and Saint-Venant principle for long-period seismogravitational oscillations". Dr Garry Tee, "A tricky Tripos problem - generalized". Inga Wang, "A mathematical model of airway smooth muscle contraction and relaxation in the lung".

Seminars

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

Dr Sina Greenwood , "Characterising continuous functions".

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

Mr Stephen Budden , "Quandles and knots".

Prof. John Grue (University of Oslo), "Fully non-linear simulations of rogue waves in 3 dimensions, and comparison with experiments using particle image velocimetry".

Prof. Richard Hall (Concordia University, Montreal), "Systems of identical particles", and "Geometric spectral inversion".

Prof. Boris Altshuler (Columbia University, NY), "From quantum chaos to Anderson localization".

Dr Steven Galbraith (Royal Holloway, University of London,) "Some computational problems arising in public key cryptography".

Mile Gu (University of Queensland), "Quantum complexity as geometry".

Prof. Rostislav Grigorchuk (Texas A&M University) "The Serre property and homomorphic images of branch groups".

Prof. John H. Conway (Princeton University), "The murder weapon, the remarkable relation, and other mystery stories", and "The Game of Life" (Public lecture).

Prof. Vestislav Apostolov (University of Quebec at Montreal), "Kahler metrics of constant scalar curvature and stability of ruled complex surfaces".

Prof. Pawel Nurowski (University of Warsaw), "Distinguished dimensions for special Riemannian geometries", "Geometry of ODEs", and "Second order ODE's modulo point transformations and Cartan's method of equivalence".

Prof. Mike Steel (University of Canterbury), "Ancestral networks, and the curse of the unfaithful grandparents".

Dr Young Soo Kwon (Com2Mac Centre, Postech, Korea), "Highly symmetric embeddings of complete bipartite graphs".

Prof. Charles Leedham-Green (Queen Mary, University of London), "Periodicity and p-groups"

Dr Uwe Semmelmann (University of Koeln), "Deformations of nearly Kaehler structures".

Dr Shixiao Wang , "Vortex stability and vortex breakdown".

Prof. Marcus du Sautoy (University of Oxford), "Through the looking glass: groups from a number theoretic perspective", "Zeta functions of nilpotent groups: uniformity", and "The music of the primes" (Public lecture).

Dr Paul-Andi Nagy , "Geometrically formal manifolds".

Prof. Maurice Dodson (York University), "Good and bad vibes",

Dr Rod A. Gover , "The conformal Killing equation on forms – prolongations and applications".

Prof. John C. Butcher , "Order and stability barriers".

Garry J. Tee

Department of Statistics

Chris Wild has completed 4 years as Head of the Department of Statistics, and Alan Lee is now HOD for an interim period of 12 months.

Marti Anderson has been promoted to Associate-Professor. Marti and Sharon Browning have both been jet-setting around the US and Europe, giving and attending workshops.

Chris Triggs has assumed the Faculty of Science role of Acting Associate Dean (Information Technology), while we search for a replacement.

Continuing a departmental teaching tradition, Matt Regan won a Dean's Distinguished Teaching Award, and Rachel Fewster won a university Early Career Teaching Excellence Award. These awards are the latest in a series of seven teaching awards for the department at national, university, and faculty level since 2002.

Recent contract successes include $500,000 for Marti Anderson for ecosystems research contracts, primarily from the Auckland Regional Council, and $115,000 for Alan Lee from Statistics New Zealand. Ross Parsonage organized the department's Annual Teachers' Workshop Day for secondary school teachers, with nearly 200 participants from as far afield as the Bay of Plenty and Hawkes Bay. Maxine Pfannkuch's work in designing the new school curriculum for statistics was a major driver for the success of the day and the exceptionally large attendance.

The department's position as the Home of R has been reinforced by Ross Ihaka's R Programming Workshop in November, and the Directions in Statistical Computing workshop in February, with over 60 international participants. George Seber was the guest of honour at the international EURING conference in Dunedin. Alastair Scott gave invited addresses at 5 international conferences in 2006.

In Newsletter 98, the Department of Statistics Report told that in 1986 the Swedish government and the city of Pitea presented the University of Auckland with a bronze portrait bust of Daniel Solander F.R.S. (1733-1782), who was one of the very first scientists in NZ. And Ilze Ziedins has been awarded the first Solander Fellowship, to visit Lund University to continue her collaboration with some researchers there. This photograph of Ilze with Daniel was taken by Jeremy Ralston for the University of Auckland.

And finally, an unexpected collaboration with the English department hit the headlines in November 2006, when for the first time Statistics Department research became the topic of a children's book and play! 'The Amazing Adventures of Razza the Rat', by Witi Ihimaera, was inspired by James Russell's adventures with 'lost, stolen or strayed' radio-tagged Norway rat Razza. The story was performed by the children of Sunnynook Primary School in December. Reeling from the shock of being portrayed in the book as an elderly balding scientist, and on stage as a 9-year-old girl, James submitted his PhD thesis and fled to the South Island, where he hasn't been heard of since...

Seminars

Dr Richard W. Katz (Institute for Study of Society and Environment National Center for Atmospheric Research), "Hidden and not-so-hidden Markov models: implications for environmental data analysis".

Dr Sharon Browning , "Haplotype inference using an empirical linkage disequilibrium model".

Dr Linda Green (Columbia University), "Using stationary queueing models to set staffing levels in nonstationary service systems".

Prof. Di Cook (Iowa State University), "An EDA of my CDs",

Garry J. Tee

UNIVERSITY OF CANTERBURY

Department of Mathematics and Statistics

Congratulations to David Wall, who has been promoted to Professor, Charles Semple, promoted to Senior Lecturer above the Bar, and Mike Plank, promoted two steps up the Lecturer scale. 2006 was a good year for David: he was elected a foreign member of the Royal Society of Sciences and Letters in Gothenburg in December 2006. This Swedish society was founded in 1778.

We welcome Phil Wilson, who was recently appointed as a Lecturer. He holds an MSci and a PhD in Mathematics from University College London. Before moving here he worked as a JSPS Postdoctoral Fellowship and a Research Assistant at the University of Tokyo. His research interests include mathematical modelling in biology and industry, multiscale information transfer and emergent phenomena, and philosophy and communication of mathematics. We also welcome Iris Loeb, who will work as a postdoctoral fellow on Douglas Bridges's Marsden-funded research project. On a sadder note, we farewell long-standing staff member Bill Baritompa, who retired at the end of last year. John Hannah brought an axe to Bill's farewell dinner in the hope that he would show us once more how to use it to measure the area inside a closed plane curve. Bill declined for fear of scratching the restaurant table-tops, but he was persuaded to bring out his famous banjo for a last sing-along. We wish Bill all the best for his retirement.

Ronald Begg handed in his PhD thesis in February; he awaits the examiners' reports. He has already moved to a position as a Research Fellow at Massey University (Albany). Postdoctoral fellow Erick Matsen has been offered a prestigious 3-year Miller Fellowship at UC Berkeley, starting from August 2007.

In February a week-long biomaths workshop was organised at the University of Canterbury's field station at Cass, near Arthur's Pass. This small, informal meeting has been held for the past three years to provide a focus for the overseas visitors and Summer students who typically are around following the annual phylogenetics meeting in February. This year's Cass theme was "Random models in phylogenetics and resolving ancient divergences", and around 15 people were involved during the week. Successful assaults were made on the summits of Mt Misery, Mt Rolleston and Mt Binser.

Alex James, Mike Plank and PhD student Scott Graybill attended the ANZIAM 2007 Conference in Fremantle, Western Australia from late January to early February. Alex gave a talk on "The laziest insect in the world", Mike a talk on "Superspreading" and Scott a talk on "Mathematically modelling a nephron". Scott also attended the ICE-EM summer school in Sydney and MISG2007. He attended the Stochastic Calculus and Geophysical Fluid Dynamics courses at the summer school. He found the Stochastic Calculus course particularly enjoyable and expects it to come in very handy later in his PhD. At MISG he worked on a problem from the Australian Department of Defense. Scott would like to thank the NZMS for their generous financial assistance which made his trip possible.

Prof Marcus du Sautoy of Oxford University visited Canterbury for a week in February, supported by a Maclaurin Fellowship from NZIMA. Marcus gave a well-attended public lecture based on his book "The Music of the Primes" as part of the Faculty of Science Prestige Lecture series. He also gave a departmental talk and recorded an interview which is to be podcast as part of the university's outreach programme. Between the lectures he managed to squeeze in some research with Ben Martin on zeta functions of nilpotent groups.

Ben and his wife Rachel had their first child Daniel at the end of January. Already Daniel has attended his first maths seminar — but he started grizzling after two minutes and had to leave!

Visitors

Recent visitors include: Dr Magnus Bordewich (Durham), Dr Balchandra Thatte (Massey), Prof Seng Luan Lee (Singapore), Ms Tanya Gernhard (Munich), Mr Dennis Wong (New Brunswick), Ms Tracy Heath (Austin Texas), Prof Gerhard Kristensson (Lund), Prof Richard Law (York), Dr Stefan Grünewald (Institute for Computational Biology, China), Dr Catherine McCartin (Massey), Prof Hendrik van Maldeghem (Ghent) and Fabio Pardi (Welcome Trust Genome Campus, UK).

Seminars

Prof Rainer Loewen (University of Braunschweig), "Compact Projective Planes: an introduction to topological geometry"

Andrea Mercatanti (Bank of Italy), "A likelihood-based analysis for relaxing the exclusion restriction in randomized experiments with imperfect compliance"

Prof Cristian Calude (University of Auckland), "Most programs stop quickly or never halt"

Dr Britta Basse (University of Canterbury), "Weeds in New Zealand: introduction-spread-impact-control"

Prof Ludwig Staiger (Martin-Luther-Universität Halle-Wittenberg), "The Kolmogorov complexity of infinite words"

Prof Marcus du Sautoy (University of Oxford), "Through the looking glass: groups from a number-theoretic perspective"

Prof Seng Luan Lee (National University of Singapore), "Tight frames and transformations on triangular meshes in R^3"

Prof Theodore Hill (Georgia Institute of Technology), "Fair Division Problems: Cake Cutting and Convexity"

Prof Nira Dyn (Tel Aviv University), "Subdivision schemes for the refinement of geometric objects"

Dr Rua Murray (University of Waikato), "Generalized Baker's maps and slow decay of correlations"

Prof Charles Swartz (New Mexico State University), "Generalizations of the Orlicz-Pettis Theorem"

Dr Dillon Mayhew (Victoria University of Wellington), "The structure of binary matroids with no $M(K3,3)$-minor"

Dr Laura Ciobanu (Centre de Recerca Matemàtica, Barcelona / University of Auckland), "Understanding groups by solving equations"

Dr Clemency Williams (University of Canterbury), "A Fifteenth Century 'Third-Order Taylor Series' Approximation to the sine function and other mathematical features in Paramesvara's Siddhantadipika"

Dr Elaine Crooks (University of Oxford), "Spatial segregation, interfaces, and reaction-diffusion systems"

Ben Martin

MASSEY UNIVERSITY

Institute of Fundamental Sciences (Palmerston North)

Our congratulations to Igor Boglaev who has been awarded a personal chair in Computational Mathematics.

Christopher Tuffley joined us as a lecturer in January. Chris is originally from Christchurch, and was a student at the University of Canterbury from 1993 to 1997, where he completed a B.Sc(Hons) and an M.Sc. under Mike Steel. He then went to the USA to do his Ph.D. at UCBerkeley, under Rob Kirby. He graduated in 2003 and then spent three years as a Lecturer at the University of California, Davis, before returning to his native land this year. During his time in the US Chris also spent five summers working for Canada/USA Mathcamp, a summer programme for mathematically talented high school students.

Charles has returned from a years sabbatical leave at the Federal University of Mato Grosso do Sul in Campo Grande Brazil. Charles reports:" The Federal University of Mato Grosso do Sul is a nationally funded university. However the funding appears to be quite inadequate. Although the university grounds are attractive, the buildings are rather shabby and run down. The university does not have the facilities to handle the student demand, as Campo Grande is a city of 700,000 and appears to have a higher proportion of young people than Palmerston North. Therefore potential students have to undergo a series of rigorous entrance examinations, and the failure rate is usually over 90%. (In fact, in medicine it is approximately 99%.) Consequently the quality of the students who do get admitted is very high. Most of the student body consists of undergraduates, but there is a sprinkling of postgraduate students.

I should comment on some other aspects of life in Brazil. Compared with New Zealand, it is a crime-ridden country with a high level of violence. However this feature of life in Brazil afflicts mostly the very largest cities, notably So Paulo and Rio de Janeiro. My wife and I did not feel particularly insecure in Campo Grande. In regard to health, the list of risks that appears in the Lonely Planet Guide is rather daunting, but in practice we found that there was little to worry about. Malaria and yellow fever, for example, seemed to be absent from Campo Grande. On the other hand, it turned out to be a bad year for dengue fever, thousands of cases being reported in the state of Mato Grosso do Sul, including many in Campo Grande."

The Institute of Fundamental Sciences mathematic summer students were: Kristin McLeod (with Robert McLachlin), Luke Fullard(with Tammy Smith), Jay Taala (with Igor Boglaev) and Hilary Cockran (with Tammy Smith and Davis Perry). This resulted in some excellent research and seminars. These talks can be found on: http://ifs.massey.ac.nz/scholarships/reports.shtml

From 12-16 February Tammy Smith (and other members of IFS from Chemistry and Physics) attended the "Proteins: Structure, Function and As-

sembly in Health and Disease" conference in Rotorua. Tammy's talk was entitled "Sequence analyses of Type I and Type II chains in human hair and epithelial keratin intermediate filaments: promiscuous obligate heterodimers, Type II template for molecule formation and a rationale for heterodimer formation". The conference was organized to bring together leading scientists in proteins research from around the world and New Zealand. There were many interesting talks and discussions as well as great food, the Polynesian Spa and other social programmes and cultural entertainment.

News from the Alan Wilson Centre. Barbara Holland reports from the Alan Wilson Centre: "One of the highlights of the phylogenetic year is the annual conference in February. This rotates through three locations (Kaikoura, Whakapapa, and Whitianga) and this year we were in the Central Plateau. The conference is limited to 50 participants and always sells out within a week or two of registration opening. As per usual there was a mix of mathematicians and evolutionary biologists, although this year the mathematical types outnumbered the others. We might be in danger of getting a name for ourselves amongst the biologists as doomsayers, as this year we heard a number of alarming results. Mareike Fischer, a Phd student of Mike Steels from Canterbury, extended a result that shows that sequences which are homoplasy free on one tree (that is they require no site to mutate more than once) can give rise to genetic distances that fit exactly on a different tree. Eric Matsen, also based with Mike Steels group, showed that on the basis of site pattern frequencies mixtures of two trees can be indistinguishable from a third different tree. This result seems like it could well be a problem in practice as it is common to analyse concatenations of genes which each may be evolving according to different processes.

We have had several visitors to the AWC in Palmerston North throughout the summer. Bill Martin from the University of Dsseldorf, and Editor in chief of the top-ranked journal, Molecular Biology and Evolution, has been visiting Pete Lockhart as part of his Julius von Haast Fellowship. Fabio Pardi an Italian PhD student from Cambridge has been working with Mike Hendy on algorithmic aspects of the Balanced Minimum Evolution method. Ulf Liebel, who is starting his PhD at Rostock, visited for four weeks and worked with David Penny to extend some of the work of our former PhD student - Paul Gardner, who is currently in Copenhagen.

The AWC is hosting two international conferences coming up this winter. The first is Evolution which will be in Christchurch from 16th-21st June. This is a major conference which usually attracts over a thousand delegates, and this is the first time it has been held out of North America. Shortly after Evolution the Dumont D'Urville Workshop on Applied Evolutionary Bioinformatics will be held in Kaikoura. The New Zealand Ministry of Research, Science and Technology and the French funding agency EGIDE have jointly funded two workshops on Applied Evolutionary Bioinformatics, with the second workshop planned for France in 2008.

The AWC, like other CoREs and CoRE hopefuls, is in the middle of the selection process for a second round of CORE funding (to begin in 2008), with a final outcome expected in June/July."

The AWC has also just implemented its BioMirrors website, where regularly updated copies of the major biological sequence databases are available, and connected to Helix, our beowulf cluster on the Albany cluster. This resource is also available to external researchers."

Graduate Seminars Series

Kristin McLeod (IFS Summer Student), "A geometric integrator for Poincar maps of Hamiltonian Dynamical Systems."

Hilary Corkran (IFS Summer Student), "Keratin intermediate filaments."

Jay Taala (IFS Summer Student), "Numerical experiments on uniform convergence."

Luke Fullard (IFS Summer Student), "Modelling hydrothermal eruptions."

Dr Chris Tuffley , "Distinguishing knots using the fundamental group."

Marijcke Vlieg-Hulstman

Institute of Information and Mathematical Sciences (Albany)

Several of us participated in the NZ mathematics Colloquium held at Waikato University, Hamilton, in December 06. The following talks were given by members of IIMS:

Kevin Byard , "Applications of qualified residue difference sets".

Shaun Cooper , "Powers of Eulers product".

Amanda Elvin , "Investigation of a neural field model".

Sharleen Harper , "Modelling droplets interception by a shelterbelt: a continuum approach".

Jeff Hunter , "The computation of moments of first passage times in a Markov chain".

Carlo Laing , "Periodically-forced finite networks of heterogeneous coupled oscillators".

Heung Yeung Lam , "q-series in number theory and combinatorics".

Robert McKibbin , "Particle transport by a layered atmosphere".

Ratneesh Suri , "Fisheries under uncertainty: a sensitivity analysis based on numerical methods".

Winston Sweatman , "Full ionisation in low energy three- and four-body gravitational encounters".

Graeme Wake , "A model for phenotype change in a stochastic framework".

Mick Roberts gave an invited talk: "Modelling the evolution and transmission of a virus".

There were two significant successes for members of the Albany Maths group at the Colloquium. Mick Roberts was awarded the NZ Mathematical Society's Research Award for 2006. This is in recognition of the excellence of Mick's research and his international standing. Kevin Byard, a PhD student under Shaun Cooper's supervision, won the NZMS's Aitken Prize for the best student talk at the Colloquium. This is the fourth year in a row that our students have carried away the Aitken Prize (Cynthia Wang in 2003, Jo Mann in 2004 and Amanda Elvin last year), while Frederick Lam and Sharleen Harper were Highly Commended in 2004 and 2005 respectively.

At the ANZIAM (NZ Branch) AGM held during the Colloquium, Carlo Laing was re-elected as Chair of the NZ Branch of ANZIAM for the next year.

Several of us also participated in ANZIAM 2007 which took place at Fremantle, Western Australia. The following members of IIMS gave talks at ANZIAM:

Carlo Laing , "Coarse-grained dynamics of an activity bump in a neural field model".

Robert McKibbin , "Models for large-scale transport of particulates by the atmosphere: a search for analytic solutions".

Mick Roberts , "How to model a virus that doesnt (yet) exist".

Winston Sweatman , "Destruction of binary stars in low-energy gravitational encounters".

Sharleen Harper , "A continuum approach to modelling droplets interception by a shelterbelt".

Ratneesh Suri , "Optimization in fisheries under uncertainty".

Graeme Wake gave an invited talk: "Modelling of cancer treatment".

Sharleen Harper (pictured above at the award ceremony, photo by your editor) won the hotly contested T.M. Cherry Student Prize at the conference. This is the second time a student from New Zealand has taken the prize (the first one was in 2000, and also from Massey Albany). Well done Sharleen!

Directly following ANZIAM07, Robert McKibbin, Winston Sweatman and Graeme Wake attended the Mathematics-in-Industry Study Group MISG2007 in Wollongong. As usual this workshop was a stimulating and interesting interaction between Mathematicians/Statisticians and Industry. Robert was the Invited Speaker for this event and gave two talks: "Well, What do you know?" at the student workshop on the Tuesday evening and "Industrial Mathematics: Endless Conversations" on the Wednesday afternoon. Winston was a moderator for the Transpower NZ / Energy Efficiency and Conservation Authority NZ Project: "Operating and planning an electricity transmission grid to maximise the contribution of wind ".

The Proceedings of the third (and, for now at least, the last) Mathematics in Industry Study Group that was held in NZ in 2006 was published in January by the Centre for Mathematics in Industry at Massey University. It is a useful source of project problems for postgraduates and others. Copies are available on request to Graeme Wake, g.c.wake@massey.ac.nz.

Robert McKibbin has stepped down as HOI from the end of March. We marked the occasion at a special morning tea on 29 March. Robert has done a great job over the years and will continue to be a member of the Mathematics group at Albany. He will make the most of his new academic freedom when spends April and May at Kanazawa University in Japan, as a Visiting Scientist funded by the NZ-JSPS Scientist Exchange Programme, working with Shigeo Kimura and his colleagues on models for particle transport by the atmosphere.

Shaun Cooper has taken Sabbatical leave and will spend a whole year in Singapore, working with Dr Heng Huat Chan.

Gaven Martin was an invited speaker at the 8th Pacific Rim Geometry Conference (NSW, Australia Dec. 2006). He also visited Syracuse University to work on a book with T. Iwaniec and K. Astala in February and March. While overseas Gaven gave Colloquia at Berkeley, Pittsburgh and Syracuse. He then was part of a focused research group at Banff International research Station for Innovation in Mathematics. There he worked with a small group from Boston, Rice, Michigan and Wesleyan Universities on questions around sharp energy bounds and the homogeneity of surfaces.

Graeme Wake co-led an International Biomathematics Workshop at the Partner Institute in Computational Biology PICB (Chinese Academy of Sciences/Max Planck Institute) in Shanghai in mid-February. He was assisted in this by Dr Britta Basse from the University of Canterbury. It consisted of lectures and workshops in "Study Group" mode. About 40 top post-graduate students from around China participated. While there, Britta and Graeme together with their partners joined in the celebrations of the Chinese New Year (the year of the pig). Fireworks were set-off all night!! PICB is co-directed by Professor Andreas Dress. During the week Graeme and Britta also participated in a Shanghai-wide forum on Industrial Mathematics. Graemes power point on IM is available on: http://www.massey.ac.nz/~wwiims/Files/Shanhai.ppt

Mick Roberts was an invited speaker at the DIMACS Workshop on immuno-epidemiology, DIMACS Center, Rutgers University, New Jersey, 11-15 December 2006, where he presented the talk "A mathematical model for the within-host evolution and transmission of a virus. "

Carlo Laing visited Princeton for a week in December where he worked with Yannis Kevrekidis.

Alona Ben-Tal has participated and given a talk at the Australian & New Zealand Society of Respiratory Science Annual Meeting in Auckland on 23-26 March.

Congratulations to Tania and Richard Evans on the birth of their son Nicholas Richard Evans who was born on 22 November 2006.

Visitors

Gayle Britten, a deputy principal at Rutherford College, has joined IIMS for a year as a Royal Society Teacher Fellow. During her time here she plans to learn what doing maths at university is like and what mathematicians really do. We all hope that this will help motivate more high school students to study maths.

Ronald Begg, who has just submitted his PhD thesis to the University of Canterbury, is taking up a 6-month Research Fellowship at IIMS to work with Graeme Wake.

Dr Surattana Sungnul from King Mongkuts Institute of Technology, North Bangkok, Thailand is visiting us for 2 months while on sabbatical. Surattana is a Lecturer in Mathematics there and is working in fluid mechanical problems with Robert McKibbin and Graeme wake.

Alona Ben-Tal

Institute of Information Sciences and Technology (Palmerston North)

Our graduate student room has become rather crowded of late, following the arrival of Ting Wang (China), Marisa Isidro (Philippines), Tilman Davies (Australia), and Joyce Leung and Brigid Betz-Stablein (Palmerston North). Another arrival from across the Tasman is Jonathan Marshall, who is here on a Massey University postdoctoral scholarship to work with Professors Martin Hazelton and Nigel French on smoothing relative risk surfaces in epidemiology. A much loved staff member has finally retired after 7 years of invaluable service - Louie, Jonathan Godfrey's guide dog.

Ricardas Zitikis visited again in October to work with Chin Diew Lai and Mark Bebbington. Ricardis contributed an amusing and thought-provoking seminar to the Palmy Statisticians Day which, along with David Baird's keynote address helped to make it another enjoyable and successful meeting. We currently have a sabbatical visitor from Korea,, who will work with Ganesalingam.

Doug Stirling spent some time at Nestl in Lausanne, Switzerland in late September, working on the new chocolate version of CAST. At the same time Steve Haslett was in Nepal giving the final presentation of the poverty mapping project with the World Food Programme and World Bank.

Two staff members are currently on sabbatical: Mark Bebbington in Palmerston North, and Alasdair Noble in Southampton.

Geoff Jones

NIWA

It is my pleasure to report the 2-month visit of Prof. Steve Chapra, Professor, Berger Chair, Department of Civil and Environmental Engineering, Tufts University, outside Boston. Steve loves the outdoors and his mathematics, and it has been a treat having him share his enthusiasm for pollutant modelling, and his pioneering work on eutrophication. Steve considers himself "blessed to have found a profession where he can meld his love for mathematics and science with his passion for the natural environment". Steve has published a number of books on surface water quality modelling including one on numerical methods for engineers and is currently working with Graham McBride at NIWA on an ESR project (led by Brent Gilpin, ESR) on developing "Analytical models for efficacy of Best Management Practices for the reduction of zoonotic pathogens".

Aroon Parshotam

UNIVERSITY OF WAIKATO

DEPARTMENT OF MATHEMATICS

In the latest promotion round, Sean Oughton was promoted to Associate Professor and Ian Hawthorn was promoted to Senior Lecturer. Congratulations to them both. Academic departments tend to have a pyramidal hierarchy; we have a tower structure with three each of senior lecturer, associate professor, and professor.

Ian is on study leave this semester. He will be based in Hamilton most of the time, but will make a trip to the United States.

Ernie Kalnins gave two talks on Lie groups, special functions and partial differential equations at the NZMRI Summer Meeting held in January at Waitangi. This was part of NZIMA's thematic programme on Partial Differential Equations. He writes: "This workshop covered a variety of topics in partial differential equations, from the very applied to the theoretical. It was in fact a very informative meeting for a theoretician in that it revealed new applications of the use of partial differential equations in geothermal modeling, porous media and image analysis."

Ian Craig and Tim Stokes went to the 2007 ANZIAM meeting held in Fremantle. Tim presented a talk titled "Varying the flow rate of a line sink in a fluid of finite depth". After ANZIAM, Ian then spent several days visiting his former post-doc, Paul Watson, at the University of Sydney.

Stephen Joe spend five weeks in January and February visiting the University of New South Wales before attending the 2nd Workshop on high dimensional approximation held at ANU in Canberra. At the workshop, he presented a talk titled "Sobol′ sequences with 'good' two-dimensional projections".

Seminars

J. Garcke (Technische Universität Berlin), "Sparse grids for machine learning".

Stephen Joe

VICTORIA UNIVERSITY OF WELLINGTON

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

Noam Greenberg is organizing and speaking at a special session of the American Mathematical Society meeting in Gainesville.

Peter Cholak (Notre dame) and Mia Minnes (Cornell) were visiting the Logic group here. Miroslav Lovric (McMaster University - Canada) and Alok Goswami (Indian Statistical Institute) are here visiting the Statistics group.

Rod Downey's postdoc Antonio Montalban has been offered postions at MIT, UCLA and Chicago. He has accepted the one in Chicago.

Vaughan Jones (University of California at Berkeley) gave a lecture on "Why Flatland is a Great Place to do Algebra" at Victoria University on Friday 16th March.

Logic and Computation Student Luke McCrohon has been awarded a Monbukagakusho Scholarship by the the Japanese Ministry of Education, Culture, Sports, Science and Technology to study for a Masters in Computational Linguistics at the University of Tokyo.

Jonathan Crook has been awarded a NZ Institute of Mathematics and its Applications Award, to support him in his work towards a Phd in mathematics under Mark McGuinness. Jonathan's research topic is modelling the growth of young fast sea ice in Antarctica.

Blaise Drinkwater has received a MSc scholarship from the NZIMA to do a masters with Rod Downey on algorithmic randomness.

Mark McGuinness was a plenary speaker at the ANZIAM meeting in Fremantle in January, where he spoke on the modelling of platelet ice in Antarctica. Mark and Jonathan Crook both attended the Mathematics in Industry Study Group that followed, in Wollongong, where Mark was moderator of the problem from Bluescope Steel on modelling wrinkles in sheets of steel.

Seminars

Ian Hodkinson (Imperial College London), "Axiomatising modal logics of elementary classes of Kripke frames", and "Axiomatising the Modal Logic of Affine Planes"

Rob Goldblatt , "A Kripke-Joyal Approach to Residuated and Linear Logics"

Friedrich Eisenbrand , "Constrained Minkowski Sums: A framework for solving subsequence problems efficiently"

Vaughan Jones (University of California at Berkeley), "Why Flatland is a Great Place to do Algebra"

Mia Minnes (Cornell), "High Scott Rank in Automatic Structures"

Peter Cholak (Notre dame), "Coding in Orbits and Automorphisms of E*"

Professor Zdzislaw Brzezniak , (University of York), "The Ito integral with values in certain Banach spaces: applications to stochastic ODEs and PDEs on manifolds"

Professor Ryszard Zielinski , "Statistical problems of estimation of social index"

Brent Coker , "A Measure of Internet Purchase Confidence"

Prof. W. Zelazko (IMPAN Warsaw), "Some properties of the space (s)"

Professor S.Feinberg (Carnegie Mellon University), "Bayesian Mixed Membership Models for Soft Clustering"

William J. Reed , "Normal-Laplace Distributions and their Applications"

Prof. W. Zelazko (IMPAN Warsaw), "On hyperinvariant subspaces for linear maps"

Wojciech Sulisz , "Prediction of Nonlinear Wave Propagation and Transformation in a Wave Train Results of EU MaxWave Project"

Konstantin Kvatch , Haizhen Wu, Nick Webb, Paul Yan, Giorgi Kvizhinadze, "Unusual phenomena in probability and random processe"

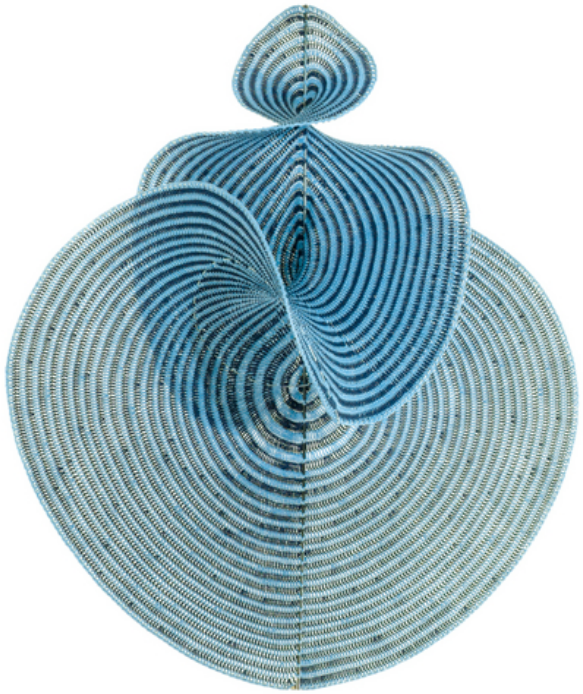
Miroslav Lovric , (McMaster University), "In Math Education, What You Say is Either Trivially Correct or Fundamentally Wrong"

Professor Alok Goswami (ISI Calcutta), "Random continued fractions"

Gareth Baxter , "Fish & Chips or Fush & Chups?"

Rowan & Mark

Dr. Hinke Osinge (University of Bristol), a plenary speaker at the ANZIAM conference in Fremantle, spoke vividly about the stable manifold of origin of the Lorenz equations, visualised in crochet form. Fascinating!



http://www.anziam07.murdoch.edu.au/Osinga.php

FEATURES

In October 2006 Massey launched a web-site called MathsFirst. The site was designed to help students achieve success in their first year mathematics studies. It is the result of a lot of hard work by Tammy Smith (project leader), Kee Teo, Bob Richardson, Rebecca Keen (a summer student) and Judy Edwards (IFS ICT officer).

As we all know, success in first year mathematics papers is dependent on competency in Algebra. Algebra review tests given to our first year calculus students at the beginning of each semester show a very high correlation between those who fail this diagnostic test and those who fail the paper. In an effort to get the message out to students as soon as possible on the basic skills required for each paper and to provide them with support to brush up on any skills required, we have developed a web-site called MathsFirst.

MathsFirst provides the information and resources students need to prepare for first year mathematics courses at Massey University and to determine which course is best suited for their abilities. The site contains a course map outlining Masseys first year mathematics papers and the background required for each course. Students can take an online "Are you prepared?" quiz to determine if they have the necessary algebraic and calculus skills to succeed in a given course. The quizzes provide feedback on areas which the student may need to revise and online help to aid them in this process. Help is available in the form of interactive practice web pages on several topics in algebra, trigonometry and basic calculus. The feedback provided in these interactive sessions will be important in building student confidence in basic Algebra and Calculus. There are plans for improving the site in future by putting more Calculus content online.

The site is freely available to all (`MathsFirst@massey.ac.nz`) and several schools and universities (including two in Australia) have linked their web pages to MathsFirst. There has been a lot of positive feedback from those using it both at schools and at Massey and it is currently the most used part of Masseys Student Learning Centre web-site.

BOOK REVIEWS

"Number Theory in the Spirit of Ramanujan", by Bruce Berndt.
American Mathematical Society, Providence, RI, 2006, xx+187 pp. ISBN: 978-0-8218-4178-5; 0-8218-4178-5. US$35.00.

Reviewed by Shaun Cooper, Massey University.

The story of Srinivasa Ramanujan (1887–1920), from humble beginnings in India, to how he came to work with G.H. Hardy at Cambridge, and his tragic death at an early age back home in India, is one of the most famous and intriguing stories in mathematics. Many accounts of Ramanujan's life have been written. The best and most comprehensive is R. Kanigel's book [12].

Ramanujan's Collected Papers [14] were published in 1927, and these were reprinted in 1962 and 2000. The most recent edition contains a commentary by B.C. Berndt which provides an update on progress since Ramanujan's time. It had been planned to publish Ramanujan's Notebooks together with the Collected Papers in 1927, but a lack of funds prevented this. The Notebooks were eventually

published in 1957 [15]. A manuscript and other writings of Ramanujan — now called the Lost Notebook — was published in 1988 [16].

Until the publication of the Notebooks and the Lost Notebook, only a few people had access to them. One of these was G.H. Hardy, the person who knew Ramanujan and his mathematics best. Hardy urged that the Notebooks be analyzed in detail, and in 1923 gave an overview of one of the twenty-one chapters [10]. According to B.M. Wilson [5, p. 5], this was a difficult task which took Hardy three to four full months of hard work. In the 1930's, Hardy gave lectures and courses on Ramanujan's work at Harvard, Princeton and Cambridge. Some of these lectures were written up in a series of twelve essays published in 1940 [11]. This work is now in its fourth edition; the most recent edition contains a commentary by Berndt.

Others to have seen Ramanujan's Notebooks before they were published include G. Pólya. In 1925 he borrowed Hardy's copy of Ramanujan's Notebooks, and [5, p. 14]: *"... a couple of days later ... returned them in almost a state of panic explaining that however long he kept them, he would have to keep attempting to verify the formulae therein and never again would have time to establish another original result of his own".*

G.N. Watson and B.M. Wilson began editing Ramanujan's notebooks in 1929, thinking it would take about five years. Wilson died prematurely in 1935 and the editing stopped. Watson ended up writing about 30 papers in total on Ramanujan's mathematics, and seems to have stopped working on it in the late 1930s.

It is believed [1, p. 3] that Watson came into possession of what is now called the Lost Notebook some time between 1934 and 1947. W.N. Bailey, who had met Ramanujan in Cambridge many years earlier, was shown some of Ramanujan's unpublished material by Watson around 1950, and used it as inspiration for the paper [4]. The reviewer believes this unpublished material was probably part of the Lost Notebook. After Watson died in 1965, by a series of miracles described in [1, pp. 3–4], the material in the Lost Notebook came to be deposited in the library at Trinity College where it lay until 1976, when it was rediscovered and brought to light by G.E. Andrews, and finally published in 1988, just after the centenary of Ramanujan's birth.

During the period 1977–1997, Bruce Berndt studied every mathematical formula in Ramanujan's Notebooks. Berndt's analysis, consisting of approximately 2000 pages, has been published in five volumes [5]–[9]. Together with G.E. Andrews, he is now in the process of analyzing every result in the Lost Notebook. See [1]–[3].

It is timely and appropriate that Berndt has written "Number Theory in the Spirit of Ramanujan", which we shall henceforth refer to simply as Spirit. It differs from Hardy's book [11] and the author's previous books [1]–[3] and [5]–[9] in a number of ways.

First, the author's books [1]–[3] and [5]–[9] are a scholarly account of the mathematical formulas in Ramanujan's Notebooks. Their purpose is to provide proofs for claims not previously established in the literature, or give citations for results already proved in the literature, and specialized knowledge is required to read them. Spirit, on the other hand, is written at an introductory level and is designed to be read as a textbook. The preface states that a solid knowledge of complex analysis is needed to understand the analytic arguments — although there are not many such arguments, and these can usually be bypassed by simply verifying the formal manipulations. The author's claim that Spirit should be suitable for junior and senior undergraduates and beginning graduate students is right on the mark. The book could be used either in a lecture course on number theory, or for self study. Researchers will want to keep a copy of this book handy for the convenience of referring to fundamental results.

Second, Spirit focusses on q-series, theta functions, and applications to number theory, whereas Hardy's book surveys a wide range topics. Hardy's book is more demanding and the prerequisites for reading it are much higher.

Third, Spirit benefits from two thirds of a century of research (done mainly in the last third of a

century!) since the publication of Hardy's book. For example, Hardy [11, pp. 222–223] described an identity, now called Ramanujan's ${}_1\psi_1$ summation formula, as "a remarkable formula with many parameters", and only touched lightly on some of its properties. This formula forms an integral part of Spirit.

Let us examine the contents of Spirit.

The preface contains an interesting account of Ramanujan's life, and traces the history of Ramanujan's Notebooks and Lost Notebook.

Chapter 1 contains a solid introduction to the fundamental theorems of q-series and theta functions. The q-binomial theorem, Jacobi's triple product identity, Ramanujan's ${}_1\psi_1$ summation formula and the quintuple product identity are all proved. The partition function $p(n)$ and Ramanujan's function $\tau(n)$ are introduced.

Chapter 2 is on some of the congruences satisfied by $p(n)$ and $\tau(n)$.

Chapter 3 studies the number of representations of a positive integer as a sum of two, four, six or eight squares, as well as the number of representations of a positive integer by the forms x^2+2y^2, x^2+3y^2 or x^2+xy+y^2. Some of the corresponding results involving sums of triangular numbers are also given.

Chapter 4 contains an introduction to Ramanujan's Eisenstein series

$$P = 1 - 24\sum_{n=1}^{\infty}\frac{nq^n}{1-q^n}, \quad Q = 1 + 240\sum_{n=1}^{\infty}\frac{n^3q^n}{1-q^n}, \quad R = 1 - 504\sum_{n=1}^{\infty}\frac{n^5q^n}{1-q^n}.$$

Ramanujan's derivation of the differential equations

$$q\frac{dP}{dq} = \frac{P^2-Q}{12}, \quad q\frac{dQ}{dq} = \frac{PQ-R}{3}, \quad q\frac{dR}{dq} = \frac{PR-Q^2}{2},$$

is given, and Ramanujan's proof of the result

$$Q^3 - R^2 = 1728q\prod_{n=1}^{\infty}(1-q^n)^{24}$$

is obtained as a byproduct.

Chapter 5 introduces elliptic integrals and hypergeometric functions. A proof of the inversion result for elliptic functions, constructed from results in Ramanujan's Notebooks, is given. A powerful catalogue is developed, which expresses various theta functions and Eisenstein series algebraically in terms of two parameters z and x. This catalogue has recently been extended by H. Y. Lam [13].

Some of Ramanujan's most impressive results involve modular equations. This is one of the most difficult and least accessible topics in all of Ramanujan's work. The highlight of Chapter 6 is a clear and concise introduction to Ramanujan's modular equations of order 3.

Chapter 7 is on the Rogers-Ramanujan continued fraction. Ramanujan's result for a finite form of the fraction is proved, and then by considering a limiting case, the Rogers-Ramanujan continued fraction is expressed as a quotient of two infinite series. Some fundamental properties of the fraction are proved, and several other intriguing properties are stated without proof.

Each chapter ends with some historical remarks and references to past and current research. Over 50 exercises are interspersed throughout the text. The book ends with a comprehensive bibliography listing more than 200 items.

This slender volume is extremely well-written and contains a wealth of material. It is a lucid

and accessible introduction to a rich and fascinating area of mathematics, written by the world's leading expert. For anyone with a knowledge of calculus wanting to learn about the mathematical work of Ramanujan, this book is the best place to start.

References

[1] G. E. Andrews and B. C. Berndt, *Ramanujan's Lost Notebook, Part I,* Springer, New York, 2005.

[2] G. E. Andrews and B. C. Berndt, *Ramanujan's Lost Notebook, Part II,* Springer, *to appear.*

[3] G. E. Andrews and B. C. Berndt, *Ramanujan's Lost Notebook, Part III,* Springer, *to appear.*

[4] W. N. Bailey, *A note on two of Ramanujan's formulae,* Quart. J. of Math. (Oxford) Series 2 **3** (1952), 29–31.

[5] B. C. Berndt, *Ramanujan's Notebooks, Part I,* Springer-Verlag, New York, 1985.

[6] B. C. Berndt, *Ramanujan's Notebooks, Part II,* Springer-Verlag, New York, 1989.

[7] B. C. Berndt, *Ramanujan's Notebooks, Part III,* Springer-Verlag, New York, 1991.

[8] B. C. Berndt, *Ramanujan's Notebooks, Part IV,* Springer-Verlag, New York, 1994.

[9] B. C. Berndt, *Ramanujan's Notebooks, Part V,* Springer-Verlag, New York, 1998.

[10] G. H. Hardy, *A chapter from Ramanujan's note-book,* Proc. Cambridge Philos. Soc., **21** (1923), 492–503.

[11] G. H. Hardy, *Ramanujan: Twelve Lectures on Subjects Suggested by His Life and Work,* Cambridge University Press, 1940; Second Edition published by Chelsea, New York, 1960; Third Edition published by Chelsea, New York, 1978; Fourth Edition published by the American Mathematical Society, Providence, RI, 1999.

[12] R. Kanigel, *The Man Who Knew Infinity,* Macmillan Publishing Company, New York, 1991.

[13] H. Y. Lam, *q-series in Number Theory and Combinatorics,* PhD thesis, Massey University, New Zealand, 2006.

[14] S. Ramanujan, *Collected Papers,* Cambridge University Press, 1927; reprinted by Chelsea, New York, 1962; reprinted by the American Mathematical Society, Providence, RI, 2000.

[15] S. Ramanujan, *Notebooks* (2 volumes), Tata Institute of Fundamental Research, Bombay, 1957.

[16] S. Ramanujan, *The Lost Notebook and Other Unpublished Papers,* Narosa, New Delhi, 1988.

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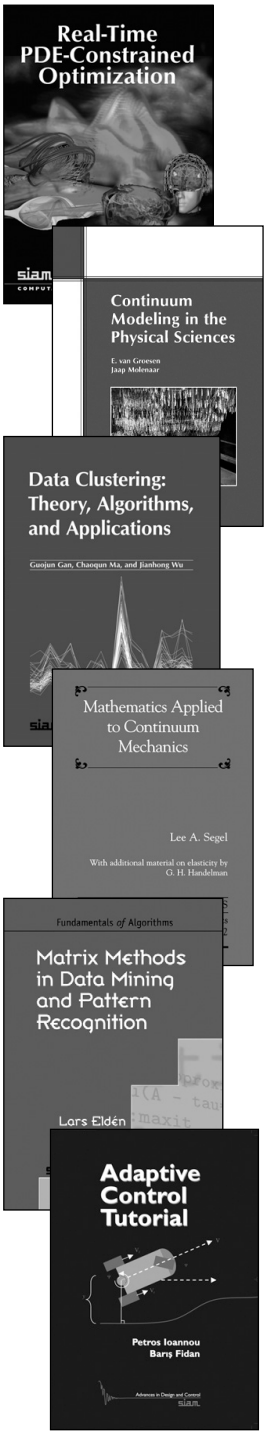

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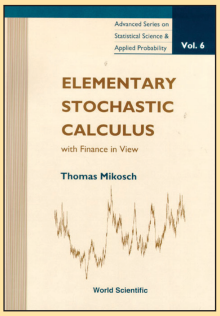

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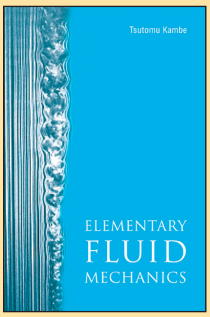

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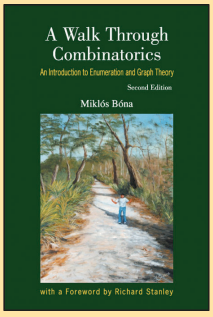

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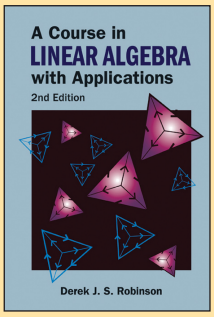

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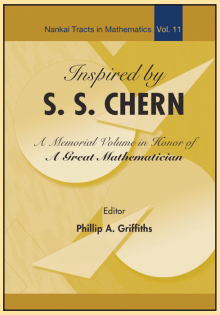

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INSPIRED BY S S CHERN

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Shiing-Shen Chern (1911–2004) was one of the leading differential geometers of the twentieth century. In 1946, he founded the Mathematical Institute of Academia Sinica in Shanghai, which was later moved to Nanking. In 1981, he founded the Mathematical Sciences Research Institute (MSRI) at Berkeley and acted as the director until 1984. In 1985, he founded the Nankai Institute of Mathematics in Tianjin. He was awarded the National Medal of Science in 1975; the Wolf Prize in mathematics in 1984; and the Shaw Prize in mathematical sciences in 2004.

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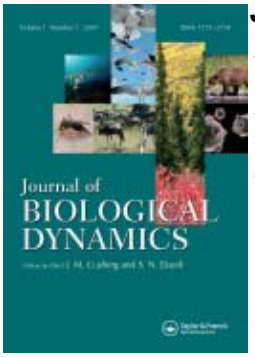

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Journal of Biological Dynamics publishes state of the art papers dealing with the analysis of dynamic models that arise from biological processes. The Journal focuses on dynamic phenomena, at scales ranging from the level of individual organisms to that of populations, communities, and ecosystems, that arise in the fields of ecology and evolutionary biology, population dynamics, epidemiology, immunology, environmental science, and animal behavior.

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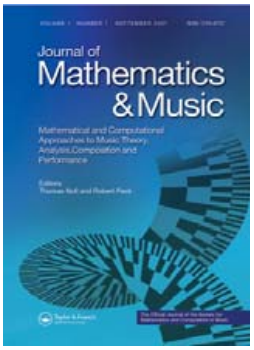

Journal of Mathematics and Music, the official journal of the Society for Mathematics & Computation in Music, aims to advance the use of mathematical modelling and computation in music theory. The Journal focuses on mathematical approaches to musical structures and processes, including mathematical investigations into music-theoretic or compositional issues as well as mathematically motivated analyses of musical works or performances. In consideration of the deep unsolved ontological and epistemological questions concerning knowledge about music, the Journal is open to a broad array of methodologies and topics, particularly those outside of established research fields such as acoustics, sound engineering, auditory perception, linguistics etc.

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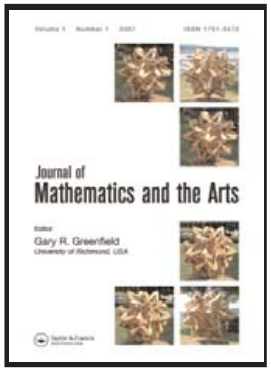

Journal of Mathematics and the Arts Volume 1, 2007, 4 issues per volume

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Journal of Mathematics and the Arts is a peer reviewed journal that focuses on connections between mathematics and the arts. It publishes articles of interest for readers who are engaged in using mathematics in the creation of works of art, who seek to understand art arising from mathematical or scientific endeavors, or who strive to explore the mathematical implications of artistic works. The term ”art” is intended to include, but not be limited to, two and three dimensional visual art, architecture, drama (stage, screen, or television), prose, poetry, and music. The Journal welcomes mathematics and arts contributions where technology or electronic media serve as a primary means of expression or are integral in the analysis or synthesis of artistic works.

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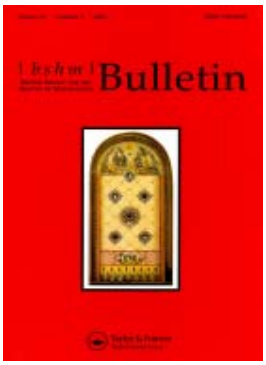
BSHM Bulletin: Journal of the British Society for the History of Mathematics

Volume 22, 2007, 3 issues per volume **www.informaworld.com/bshm**



BSHM Bulletin is the journal of the British Society for the History of Mathematics (BSHM), whose aims are to promote research into the history of mathematics and to encourage its use at all levels of mathematics education. ***BSHM Bulletin*** publishes articles, reports, and book reviews on a range of historical topics. Articles on local mathematical history, the use of history of mathematics in education, and those reflecting individual interests and research are particularly encouraged.

Editor:

Jackie Stedall - *The Queen's College, Oxford, UK*

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CONFERENCES

Report on the 2006 New Zealand Mathematics Colloquium

The 2006 New Zealand Mathematics Colloquium was held at the University of Waikato during the period 4–6 December, with a welcoming reception held on the evening of the 3rd. The Monday included a Dynamical Systems and Numerical Analysis Day and a morning devoted to Mathematics Education.

There were five invited speakers in total giving talks in a wide range of areas of mathematics:

- Brian Davey (La Trobe University) — Model theory versus topology
- Larry Forbes (University of Tasmania) — Stable and unstable interfacial fluid flows
- Georg Gottwald (University of Sydney) — A normal form for excitable media
- Robert McLachlan (Massey University, Palmerston North) — Geodesics everywhere
- Mick Roberts (Massey University, Albany) — Modelling the evolution and transmission of a virus

There were a total of 109 registrants consisting of seven for the Dynamical Systems and Numerical Analysis Day only (three of these were students), one for the Mathematics Education morning only, five invited speakers, two one-day registrations, seven two-day registrations, five retiree registrations, 36 students, and 46 full registrations.

The final number of contributed talks was 63 including 19 student talks. Twelve of these student talks were entered for the Aitken prize for the best talk by a student. The winner was announced at the Colloquium dinner and the winner was Kevin Byard of Massey University, Albany.

The large number of contributed talks combined with the constraints imposed by the timetabling of the talks entered for the Aitken prize inevitably meant that some participants had to make a choice when there were two talks of interest at the same time. Three sessions were run in parallel except on the Monday morning when there were four.

During the Colloquium, the Annual General Meetings of the New Zealand Mathematical Society and ANZIAM (NZ Branch) were held. Also, a meeting of heads of departments (or equivalent) from Auckland, Massey (Albany and Palmerston North), Canterbury, Otago, and Waikato universities took place, with discussion of various matters of mutual interest.

The NZMS Research Award for 2006 was announced at the Colloquium dinner on the Tuesday evening. It was awarded jointly to Robert Aldred (University of Otago) and Mick Roberts (Massey University, Albany). It had been pointed out that this Colloquium was the 40th Anniversary of the first Colloquium held in 1966. To celebrate this ruby anniversary, an anniversary cake was part of the dessert at the Colloquium dinner. The (ten) candles were put out by the three dinner attendees who had also attended the first 1966 Colloquium. In alphabetical order, these were Dean Halford, Ken Pledger, and Graeme Wake.

There was an excursion to Te Aroha on the Tuesday afternoon. Nearly 40 people went on this excursion.

In 2007, the Colloquium will be a joint meeting with the American Mathematical Society at Victoria University of Wellington. The 2008 Colloquium will be a joint meeting with the Australians at the University of Canterbury. It was agreed at the Colloquium Business meeting that the 2008 event will be called the "7th Australia-New Zealand Mathematics Convention", in line with the pattern establish in 2003.

Overall, the Colloquium was a success with nearly everything running smoothly. We are grateful to the following sponsors:

- the New Zealand Mathematical Society for providing financial support not only for speakers (including the NZMS Speaker, Professor Robert McLachlan), but also to enable students to attend the Colloquium;
- the New Zealand Institute of Mathematics and its Applications, through the thematic programme on Dynamical Systems and Numerical Analysis, for its financial and logistic support of the Dynamical Systems and Numerical Analysis Day;
- the New Zealand Branch of ANZIAM for its financial support of the ANZIAM Speaker (Professor Larry Forbes);
- Hoare Research Software Limited for providing financial support.

Our thanks also go to the Session Chairs who contributed to the smooth running of the Colloquium. The success of any conference is determined by those who attend. So finally, our thanks to all the attendees, who made the Colloquium the success that it was.

Stephen Joe (Convener)

Conferences Coming Up

Wednesday 4 July, 2007, Canterbury University, New Zealand: **NZSA 2007 conference**.
email: nzsa2007@gmail.com website: http://www.math.canterbury.ac.nz/nzsa2007/ A tandem conference in honour of Prof John Deeley, former Chair of Statistics at Canterbury, will be held on 5–6 July. The conference organiser, Mik Black at Otago, can be contacted at mik.black@stonebow.otago.ac.nz

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.

December 3 - 7, 2007, University of Otago, Dunedin, New Zealand: **32nd Australasian Conference on Combinatorial Mathematics and Combinatorial Computing**.
email: mike@cs.otago.ac.nz website: http://www.cs.otago.ac.nz/staffpriv/mike/ACCMCC32/32ACCMCC.html

December 12 - 15, 2007, Victoria University of Wellington, Wellington, New Zealand: **1st Joint International Meeting between the American Mathematical Society and the New Zealand Mathematical Society**.
email: Peter Donelan or Matt Miller,
mailto:peter.donelan@mcs.vuw.ac.nz or mailto:miller@math.sc.edu website: http://www.mcs.vuw.ac.nz/~mathmeet/amsnzms2007/

14–18 January 2008, Kaikoura, New Zealand: **Conference on Finite Groups and Representations**.
email: Ben Martin, B.Martin@math.canterbury.ac.nz

February 18-22, 2008, War Memorial Centre. Napier, New Zealand: **Workshop on Algorithmics**.
email: Mike Atkinson, Charles Semple, or Mark Wilson
mike@cs.otago.ac.nz, c.semple@math.canterbury.ac.nz or mcw@cs.auckland.ac.nz website: http://algo.otago.ac.nz/

December 8-12, 2008, University of Canterbury, Christchurch, New Zealand: **7th Australia-New Zealand Mathematics Convention**.
email: r.beatson@math.canterbury.ac.nz

18TH INTERNATIONAL CONFERENCE ON GENERAL RELATIVITY AND GRAVITATION AND THE 7TH EDOARDO AMALDI CONFERENCE ON GRAVITATIONAL WAVES

8 - 14 JULY 2007 Sydney Convention & Exhibition Centre, Darling Harbour SYDNEY, AUSTRALIA

Joining forces in Sydney in 2007 these conferences will bring together the world's leading scientists working in the fields of General Relativity and Gravitation.

The program for GRG18 will incorporate all areas of General Relativity and Gravitation including Classical General Relativity; Relativistic Astrophysics and Cosmology; Experimental Work on Gravity and Quantum Issues in Gravitation. The Amaldi 7 program will cover all aspects of Gravitational Wave Physics and Detection.

Sydney is situated on one of the world's most beautiful and famous harbours. Renowned for its iconic landmarks, the Sydney Opera House and Harbour Bridge, Sydney boasts many attractions including stunning beaches, fantastic shops and restaurants.

The conference will be held at Darling Harbour located within walking distance of the heart of the city. It is one of Sydney's most exciting tourist precincts offering waterfront restaurants and cafes, beautiful gardens and a range of exciting attractions.

To find out more about GRG18 or Amaldi7, please register at www.grg18.com or http://www.Amaldi7.com

NOTICES

CALL FOR NOMINATIONS FOR 2007 NZMS RESEARCH AWARD

This annual award was instituted in 1990 to foster mathematical research in New Zealand and to recognise excellence in research carried out by New Zealand mathematicians. Recipients to date have been John Butcher and Rob Goldblatt (1991), Rod Downey and Vernon Squire (1992), Marston Conder (1993), Gaven Martin (1994), Vladimir Pestov and Neil Watson (1995), Mavina Vamanamurthy and Geoff Whittle (1996), Peter Lorimer (1997), Jianbei An (1998), Mike Steel (1999), Graham Weir (2000), Warren Moors (2001), Bakhadyr Khoussainov (2002), Rod Gover (2003), Eamonn O'Brien (2004), James Sneyd and Robert McLachlan (2005), and Mick Roberts and Robert Aldred(2006).

Call for nominations 2007

Applications and nominations are invited for the NZMS Research Award for 2007. This award will be based on mathematical research published in books or recognised journals within the last five calendar years: 20022006. Candidates must have been residents of New Zealand for the last three years. Nominations and applications should include the following:

Name and affiliation of candidate. Statement of general area of research. Names of two persons willing to act as referees. A list of books and/or research articles published within the last five calendar years: 20022006. Two copies of each of the five most significant publications selected from the list above. A clear statement of how much of any joint work is due to the candidate. A judging panel of three persons shall be appointed by the NZMS Council. The judges may call for reports from the nominated referees and/or obtain whatever additional referee reports they feel necessary. The judges may recommend one or more persons for the award, or that no award be made. No person shall receive the award more than once. The award consists of a certificate including an appropriate citation of the awardee's work, and will be presented (if at all possible) at the New Zealand Mathematics Colloquium Dinner in 2007.

All nominations (which no longer need to include the written consent of the candidate) and applications should be sent by 27 July 2007 to the NZMS President, Professor Gaven Martin, Institute of Information and Mathematical Sciences, Massey University, Albany Campus, Private Bag 102 904, North Shore Mail Centre, Auckland, New Zealand.

Please consider nominating any of your colleagues whose recent research contributions you feel deserve recognition!

Geoff Mercer wins the coveted and mouth-watering Cherry Ripe prize, chosen by students, for the best non-student talk at the ANZIAM meeting in Fremantle earlier this year.

NZMS Accreditation

Applications are invited for NZMS Accreditation. The deadline for applications is Sunday 30 April 2006. If you would like to be considered or would like to nominate someone could you send for application forms to:

The Accreditation Secretary
C/- Department of Mathematics and Statistics
University of Otago University P O Box 56
DUNEDIN

or email lgrant@maths.otago.ac.nz

To help you understand better what each of the categories of membership are, I have added a copy of Article IV of the Constitution.

ARTICLE IV: OPTIONAL ACCREDITATION

An Ordinary Member (or Reciprocity Member) may apply to the Council to become a Graduate Member, Accredited Member, or Fellow. The Council shall make and issue, and may revise from time to time, Rules which shall give effect to the following requirements.

(1) A Graduate Member shall have completed a degree or diploma at a recognised university or other tertiary institution, the studies for which shall include mathematics as a major component, and shall be currently employed or occupied in the development, application or teaching of mathematics.

(2) An Accredited Member shall have completed a postgraduate degree in mathematics at a recognised university or other tertiary institution, or shall have equivalent qualifications, and shall have been employed for the preceding three years in a position requiring the development, application or teaching of mathematics.

(3) A Fellow shall be a person who currently has or previously has had the qualifications of an Accredited Member and who, in addition, is deemed by the Accreditation Committee (see paragraph below) to have demonstrated a high level of attainment or responsibility in mathematics and to have made a substantial contribution to mathematics or to the profession of mathematician or to the teaching or application of mathematics.

An Honorary Member shall have the right to become a Fellow immediately upon application to the Council and without payment of a fee.

The Council shall establish an Accreditation Committee to consider applications for designation as a Graduate Member, Accredited Member or Fellow, and to administer the Rules described in the first paragraph of this Article. In its determinations, the Accreditation Committee shall discount interruptions to employment such as temporary unemployment and parental leave.

A Graduate Member may use the abbreviation GNZMS, an Accredited Member may use the abbreviation MNZMS, and a Fellow may use the abbreviation FNZMS. These designations and the corresponding abbreviations are the rights of that class of Member only while the member remains a financial member of the Society and while the occupational requirements outlined in the first paragraph of this Article continue to be satisfied. The occupational requirements shall be deemed to be satisfied by Honorary Members and in the case of interruptions to employment such as temporary unemployment and parental leave, and they shall not be applied in the case of retirement or promotion to an administrative or other position.

A fee shall accompany each application to the Accreditation Committee. The fee shall be additional to the annual subscription charged by the Society and shall be the only charge for accreditation.

****

If you have any queries could you please direct them to me at the above address or by email (dholton@maths.otago.ac.nz).

Derek Holton
Chair, Accreditation Committee

Application for membership of the NZMS

The New Zealand Mathematical Society (Inc.) is the representative body of professional mathematicians in New Zealand, and was founded in 1974. Its aims include promotion of research in the mathematical sciences, the development, application and dissemination of mathematical knowledge within New Zealand, and effective cooperation and collaboration between mathematicians and their colleagues in New Zealand and in other countries.

Membership categories:

(Full details at www.math.waikato.ac.nz/NZMS/NZMS.html)

Ordinary*	\$36 p.a.	
Reciprocal	\$18 p.a.	

For overseas residents who are fully paid-up members of societies with which the NZMS maintains a reciprocity agreement (including the American Mathematical Society, the Australian Mathematical Society, the Canadian Mathematical Society, the London Mathematical Society, and the Mathematical Society of Japan).

Student*	\$7.60 p.a.	For currently enrolled students in NZ
Overseas student	\$18 p.a.	For currently enrolled students in overseas

(GST is added to rates for NZ residents.)

Members can subscribe to the New Zealand Journal of Mathematics (http://www.math.auckland.ac.nz/NZJM/index.html) at a reduced rate.

Members can also elect to make a donation, when paying their subs, to the NZMS Endowment for Student Support.

* The Society offers NZ students and new staff a special free one-year membership.

Please complete below and mail to:

John Shanks, NZMS Membership Secretary,
Department of Mathematics and Statistics,
University of Otago, P.O. Box 56, Dunedin, NZ

or Fax: +64 (3) 479 8427

E-mail: jshanks@maths.otago.ac.nz

NZMS Application Form

Name: _____ Title: _____

Address: _____

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_____

An institutional address is preferred

E-mail: _____

Membership category: ☐ Ordinary ☐ Reciprocal ☐ Student ☐ Overseas student

If Reciprocal then complete this:

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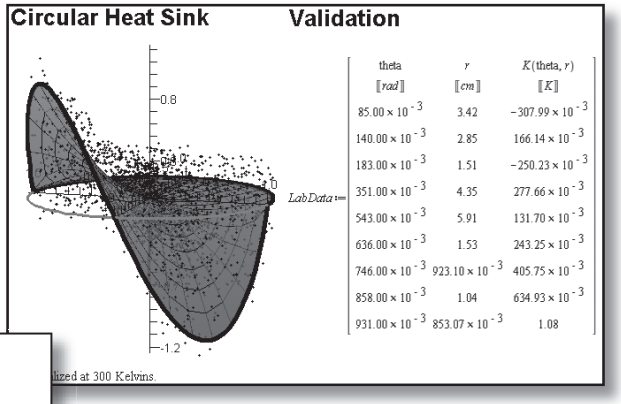

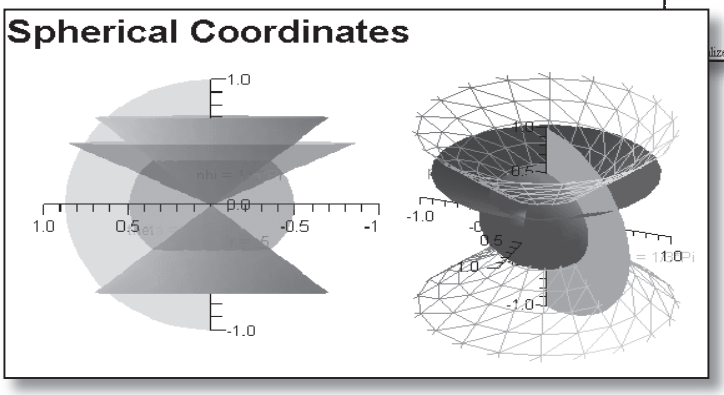

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