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NEWSLETTER

OF THE

NEW ZEALAND MATHEMATICAL SOCIETY

Contents

PUBLISHER'S NOTICE

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PRESIDENT'S COLUMN

I am pleased to announced reciprocal lectureships with the American Mathematical Society and the London Mathematical Society.

Every two years since 1987, a distinguished mathematician in the United Kingdom has visited New Zealand for three to four weeks giving a series of lectures, many of which are public lectures. Called the Forder Lecturer, the establishment of these visits followed a bequest to the London Mathematical Society from the late Professor Henry George Forder (Professor of Mathematics, University of Auckland 1934-55). Unfortunately, the bequest is now exhausted and Professor Ben Green (University of Cambridge) who is visiting New Zealand this year is the last Forder Lecturer whose costs are to be met by this fund. However, from 2011, a reciprocal arrangement is in place whereby, alternating with the Forder Lecturer, every second year a mathematician in New Zealand will visit the United Kingdom. Called the Aitken Lecturer, the first such visit is scheduled to take place next year.

Following the success of the Forder Lecturer, the Council approached the American Mathematical Society for a reciprocal exchange of lecturers. In May 2010, we received a positive response from the American Mathematical Society to say that they fully support such an exchange. The initial agreement is for six years. To alternate with the Forder lecturer, the first visit is to take place in New Zealand in 2011.

The lectureships are to be jointly funded by the New Zealand Mathematical Society, and the London Mathematical Society and the American Mathematical Society, respectively. Thank you to the Council, and particularly Robert McLachlan, for all their efforts in making these exchanges possible.

Charles Semple
President

EDITORIAL

With the help of John Shanks, our membership secretary, I have recently been pruning the newsletter mailing list. Over the years we have sent the newsletter to many associations, societies and libraries around the world. However, with the advent of the internet and the easy access this gives to online journals and electronic books many libraries are moving over to online journals to save both space and money. As the society offers an online version (all previous newsletters are available at `nzmathsoc.org.nz`) many libraries have chosen the 'e' option.

This brings us to the matter of individual members and whether people prefer to receive their news by e-mail or snail-mail. An informal tearoom survey at Canterbury showed that most people actively prefer a paper copy to read at their leisure - as one colleague put it "I prefer to spill my coffee on paper rather than my keyboard". Should we, like many other societies, offer members the option of a reduced subscription rate in return for an online only newsletter (or conversely to pay more for a hard copy)? Should overseas members pay more for the extra postage? To reduce this to hard currency our current newsletter budget is almost 50% of our student grant budget.

Whilst we have no immediate plans to change how we distribute the newsletter we are interested in what people think about this issue. If you have any views for keeping the status quo or you would be happy with an online only version, let us know at `nzmseditor@math.canterbury.ac.nz` (or you could even put pen to paper and send us a letter care of the Canterbury Maths department).

Alex James
Editor

LOCAL NEWS

AGRESEARCH

We farewell Tanya Soboleva who departs AgResearch after more than 12 years with the company. Tanya takes up a new position with the NZ Food Safety Authority as a senior adviser in the area of risk assessment and is now based in Wellington. We wish Tanya all the best for the future.

Amy Van Wey attended the annual Riddet CoRE conference to present a poster on a prototype mathematical model of biofilm growth on food within the large intestine. Amy is working on her PhD on modelling biofilms within the human bowel.

Jacob Stolk (Dione Complex Systems) gave a seminar to the group on his work on Emergent Models for Multi-level Modelling of Organisms in June. Jacob has a background in mathematical modelling and computer science and has expressed an interest in collaborating with the group.

AgResearch statisticians were out in force at the Australasian Regional Conference of the IBS in Taupo. Neil Cox and Harold Henderson were part of the local organising committee of a very well run and enjoyable conference. Most of the team of statisticians attended the conference, and Ken Dodds and Zaneta Park gave talks while Dongwen Luo and John Koolaard each presented a poster.

We also recently celebrated Harold Henderson's 35th and Kumar Vetharaniam's 15th anniversary awards with AgResearch and its predecessors.

Paul Shorten

THE UNIVERSITY OF AUCKLAND

DEPARTMENT OF COMPUTER SCIENCE

As usual, your correspondent perseveres in the face of apathy. Here is all the news that's found to print...

Cris Calude received a London Mathematical Society fellowship awarded to visit the universities in Leeds, Oxford and Edinburgh in October.

Michael Dinneen's PhD students have presented joint work with Michael and Radu Nicolescu at international conferences recently: Masoud Khosravani at SIROCCO2010 in Turkey and Yun-Bum Kim at UC10 in Tokyo.

Department staff have been active in the media (who don't seem to want to talk to theoretical computer scientists though ...). Clark Thomborson appeared on Jim Mora's show on Radio NZ, for a discussion of "BP Buys 'Oil' Search Terms to Redirect Users to Official Company Website". Brian Carpenter appeared on TVNZ News at 6 speaking about Internet IPv4 address exhaustion.

The department administers the Clinton Bedogni Prize for Open Systems which will be awarded to the New Zealander who has made the greatest contribution to the field of Open Systems (including open source software) in the past two years. The inaugural award will be made later this year. The prize is endowed by his parents in memory of an enthusiast of open systems who recently died tragically in a traffic accident and the endowment also funds a postdoctoral position currently filled by Koray Atalag.

The annual Gibbons Memorial Public Lectures had the theme 'Facing the Data Mountain' and were successfully given by Ian Witten (Waikato), Gill Dobbie, Alec Holt (Otago) and Nevil Brownlee.

Students: team enpeda came 2nd in the New Zealand round of the Microsoft Imagine Cup 2010. David MacDonald received a Fulbright Award. He is heading to the University of California, Berkeley, to undertake a Masters of Science in Computer Science.

SEMINARS

Andrew Wilmott (Maxis/Electronic Arts) "Video Games - Behind the Scenes".

Piotr Faliszewski (AGH Krakow) "The Complexity of Campaign Management - Swap Bribery".

John Case (University of Delaware) "Computability-Theoretic Learning Theory".

Jiamou Liu (University of Auckland & University of Leipzig) "The isomorphism problem on classes of automatic structures".

Mark Wilson

DEPARTMENT OF ENGINEERING SCIENCE

Inter-semester break is over, staff travelling to attend international conferences have swapped 30 degrees in Europe with the miserable 10 degrees in rainy Auckland to get ready for the new semester. However, David Ryan managed to leave for a two months visit to the UK and Denmark just as everybody else was coming back.

Right at the beginning of the semester our final year students, having just celebrated the end

of first semester exams, had to present preliminary results on their research projects on the second day of the new semester. They all did a great job in explaining their research in just five minutes. Some of our students participated in SPARK, the University of Auckland Entrepreneurship Challenge. Department of Engineering Science students Denis Helm and Simon Bull were among the winners of the ideas challenge in the Social Entrepreneurship category for their project CycleBest, which they describe as follows.

"The provision of transportation alternatives has become more and more important to the modern city. Cycling is one of the major alternatives. However safety concerns as well as finding adequate short routes have left many people not taking on cycling as an alternative. CycleBest is an online application that allows users to find multiple best routes to get from A to B. The application is based on multi-objective optimization techniques that take into account more than just the length of the route. Factors such as distance, travel time, road safety and road steepness are considered in the determination process which leaves users with better choices than other online applications".

In this report, apart from the usual list of seminars, I can report two PhD completions. Congratulations to Juliet and Eylem!

PhD THESES

Juliet Newson: "Models of Geothermal Surface Features at Wairakei".

Eylem Kaya: "Computer Modelling of Reinjection in Geothermal Fields".

Eylem carried out a modelling study of reinjection into geothermal systems in order to decide upon optimum reinjection strategies. She surveyed the worldwide reinjection experiences and influences of various strategies on hydraulic and thermodynamic conditions of the fields. Based on these experiences she investigated the effect of various reinjection strategies on "hot water", "liquid-dominated two-phase" and "vapour-dominated two-phase" reservoirs. The result of this study can be used in an attempt to establish some guidelines for geothermal reinjection strategies according to the generic characteristics of the fields.

SEMINARS

Andy Philpott (University of Auckland) "Mixed-strategy Equilibria in Discriminatory Divisible-good Auctions".

Chanaka Edirisinghe (University of Tennessee) "Arbitrage-free Pricing of Contingent Claims in Incomplete Markets via Moment Problems".

Zarrar Javaid (University of Auckland) "Automatic 3D Model Construction of the Knee Articular Cartilage using Contourlets for Fast Diagnosis of Osteoarthritis".

Lawrence Seiford (University of Michigan) "Benchmarking for Best Practice: Learning from Outliers with Data Envelopment Analysis (DEA)".

Jonas Villumsen (Danish Technical University) "Switching in the New Zealand Electricity Transmission Network".

Le Nguyen Hoang (Ecole Polytechnique Paris) "Inter-island HVDC line allocation".

VISITORS

The department has hosted a number of visitors in recent months. Ludovic Ricard and Lynn Reid visited Prof. Mike O'Sullivan in May. Professor Lawrence Seiford, an international leader in the area of data envelopment analysis, was a visitor of Matthias Ehrgott and David Ryan, as well as the Business School from March to August. Karen Willcox (MIT) visited Andrew Pullan in June and July and Judah Ari-Gur will be hosted by Andrew from July to December. Matias Rasmussen (DTU) is back to Denmark after six months as a visitor of David Ryan. Manon Vandoolaeghe was hosted by John Cater from February to June and Le Nguyen Hoang visited Andy Philpott for from April to July.

NEW WEBSITE

The department's website has been relaunched recently. The new-look website can be found at www.des.auckland.ac.nz. Information for alumni and the newsletter is at http://www.des.auckland\.ac.nz/uoa/home/for/alumniandfriends.

Matthias Ehrgott

DEPARTMENT OF MATHEMATICS

John Butcher was an Invited Speaker at the CoCo-2010 conference, June 21–25, held at Miraflores de la Sierra, Spain. That was part of the trimester programme "Combinatorics and Control 2010". He was a guest of the Academy of Mathematics and Systems Science, (Chinese Academy of Science), Beijing, from June 28 to July 2, where he presented a seminar. He was an Invited Speaker at the Summer Seminar on Numerical Methods Ordinary and Delay Differential Equations, held at Harbin Institute of Technology, PR China on July 5–9, where he presented four, two and a half-hour lectures. Then John was a guest of Nanjing University, from July 12–16. He presented two lectures at Nanjing University, and a lecture at Nanjing Institute of Technology.

Marston Conder spent most of May and early June visiting the University of Frankfurt (Germany), on a one-month resumption of his research fellowship from the Alexander von Humboldt Foundation, to work with Professor Juergen Wolfart and other members of his group on questions concerning group actions on surfaces and regular dessins. He also gave an Invited Lecture at a conference on these topics at the CIEM (Castro Urdiales) in Spain. Then in June he briefly visited the Universidad Nacional Autónoma de México, in Mexico City, and gave an Invited Plenary Lecture at SIGMAP'10 (a conference on the symmetries of graphs, maps and polytopes), at Oaxaca, Mexico. In August Marston will be visiting the University of Ljubljana and giving another Invited Plenary Lecture at a conference on the symmetries of graphs and networks, in Rogla, Slovenia. Also, his major paper (with Jozef Širaň and Tom Tucker) on the genera, reflexibility and simplicity of regular maps, has just appeared in the Journal of the European Mathematical Society.

Ganesh Dikshit edited (with Edward Beckenstein & Mona Khare) the Proceedings of the Second Dr. George Bachman Memorial Conference, published as a Supplement to the "Indian Journal of Mathematics", Volume 51, 2009.

Steven Galbraith spent three weeks in July visiting Royal Holloway University of London, where he gave a series of lectures on "Lattice-based cryptography". He also met with several research collaborators in the UK, and with a CUP editor who plans to publish his book on "Mathematics of Public-Key Cryptography". He then attended a conference on Algorithmic Number Theory in Nancy, France. Steve will give an Invited Plenary Talk at the Workshop on Information Security at Kyushu University, in October 2010. And he is a member of a research team for a project on "Pairing Acceleration for Cryptography using Elliptic Curves", funded by the Netherlands Organisation for Scientific Research, starting in early 2011. That project includes a Post-doctoral Fellow from the Netherlands visiting NZ, and Steven visiting the Netherlands.

David Gauld was invited to participate in the conference "Automorphism Groups of Topological Structures" in Eilat, on the Red Sea at the southern tip of Israel, on June 19–24. He presented a talk with the title "Homeomorphism Groups of Big Manifolds". Also, he took the opportunity to experience the heat of Eilat by walking about half a kilometre around the block after lunch. On the hottest day the temperature was 45°C. After the conference, David flew to Genève, where he continued his work with Alexandre Gabard (and Mathieu Baillif in absentia).

Sina Greenwood attended the 2010 International Conference on Topology and its Applications in Greece, and then attended the 13th Galway Topology Colloquium in Birmingham, where she gave an

Invited Talk. Sina then went to Lisbon, to continue collaborating with Chris Good in Lisbon.

Chris King and Christine set out to travel around the world for 3 months, starting with South America. On June 8 they were at Quito in Ecuador, where Chris was photographing the Spanish Colonial architecture when a robber snatched his camera and pushed him into the path of a bus. That bus violently collided with Chris and kept going, leaving him in great pain with his left thigh shattered. An ambulance took him to an emergency ward, where X-rays showed a compression fracture in his left hip. The next day he was taken to the Metropolitano Hospital, where the surgical team made an excellent repair to his hip with a massive 110 ml plate and screws, and transfused much blood into Chris — all of that was covered by his travel insurance. On the following day Chris was able to stand unaided on his broken hip, and he could walk with a walking frame. He returned to his hotel 48 hours after that major surgery. Chris and Christine rested for a few days and then they continued their interrupted tour. They travelled overland through the highlands of Ecuador, Colombia and Panama, reaching the Costa Rica border two weeks after Chris's surgery. There cannot be many retired mathematicians who could match that achievement!

Alastair McNaughton attended the ALIO-INFORMS conference (Association of Latin-Iberoamerican Operational Societies — Institute for Operations Research and the Management Sciences), at Buenos Aires on June 6–9. He was privileged to be asked to give an Invited Lecture at that conference on the topic "Forest Harvesting with Adjacency Branches and Column Generation". The conference was excellent, with many interesting papers given on various applied and theoretical topics in operations research. Although the conference was international, there was a marked Latin American atmosphere. Alastair learned quite a lot about specific South American case studies and met plenty of stimulating new academics, as well as renewing association with known international figures. The conference was held in a most imposing grand old building, in the Greek style of the Auckland War Memorial Museum, which is part of the University of Buenos Aires Law School. He got to deliver his talk in a magnificent lecture hall, with a huge mural across the front depicting events associated with the history of Argentina. Outside the conference there were opportunities to sight-see. A minimal knowledge of Spanish was absolutely essential. The local people were friendly and helpful. Various practical tasks such as how to take a ride in a bus presented daunting challenges. Buenos Aires is a great city with a wealth of facinating places to see, but you have to be proactive in getting about. That was Alastair's first conference in South America, and very different from those which he was used to in North America and Europe. It was exhilarating. If you have not yet attended a conference in these parts, then Alastair recommends you to plan to do so without delay. And start learning Spanish.

Barbara Miller-Reilly held a BRAP award from the Royal Society of NZ at Kings College London for June and July, researching on adult numeracy with Professor Diana Coben.

Ivan Reilly gave an invited lecture at the Mathematical Institute of Oxford University on April 28. At the British Library he saw on display Augusta Ada's letter to Charles Babbage in 1843, debugging his program for the Analytical Engine to compute Bernoulli numbers.

Mike Thomas was promoted to Professor, with effect from 1 February, 2010. He gave invited talks on Technology in Mathematics Learning at the Technische Universität Darmstadt on June 8, and at Universität Würzburg on June 9. He made research visits to Prof. F. Arzarello at Turin University on June 14–16, and to Prof. B. Jaworski at Loughborough University on June 19–20. His paper (with A. J. Wilson, Michael C. Corballis, V. K. Lim & Caroline Yoon) on "Evidence from cognitive neuroscience for the role of graphical and algebraic representations in understanding function" has been published in ZDM: The International Journal on Mathematics Education (2010).

Catherine and Shayne Waldron are delighted to announce the safe arrival of Dorothea Belle Mawson Waldron on March 26, weighing 3.19 kg. Shayne was interviewed (but not about Dorothea) on National Radio by Kim Hill, on April 3.

Mike Meylan, Maxine Pfannkuch and Shixiao Wang were all successful in their FRDF applications; Arkadii Slinko was successful in both of his applications, for FRDF and for ISAT.

After immense lobbying efforts, the Faculty of Science has approved three new permanent positions for our Department, with the possibility of two more senior positions through the VC's Strategic Initiative. Watch out for the advertisements!

Howie Cohl has passed the orals for his second PhD degree — he already had a PhD in Astrophysics from Louisiana State University.

Recent visitors include: Dr James Avery (University of Copenhagen), Mr. Olivier Bernard (Ècole Normale Superieur, Paris), Dr Piotr Faliszewski (AGH University of Science and Technology, Krakow, Poland), Dr Chris Good (University of Birmingham), Dr Thomas Hangelbroek (Texas A&M

University), Prof. Martin Liebeck (Imperial College), Prof. Volkmar Liebscher (University of Greifswald), A-Prof. Primoz Moravec (University of Ljubljana), Prof. Mike Newman (ANU), Prof. Brian Raines (Baylor University, Waco), Dr Claas Roever (National University of Ireland, Galway), and Casey Sherman (Baylor University, Waco).

SEMINARS

David Gauld "How many open sets may a Hausdorff space contain?"

Patrick Girard (Department of Philosophy) "Reasoning about social preferences".

Philip Sharp "Unexpected periodicities of asteroids".

Michèle Artigue (University of Paris 7) "The School-University interface".

Roger Howe (Yale University) "Hibi rings in invariant theory".

Casey Sherman (Baylor University) "Characterizing homeomorphisms on Cantor sets".

Brian Raines (Baylor University) "Orbit structures that imply a nondegenerate connected component".

Chris Good (University of Birmingham) "Dense periodic points revisited".

Martin Liebeck (Imperial College) "Triangle generation and rigidity of simple groups".

John Butcher "How accurate is a numerical method?"

Thomas Hangelbroek (Texas A&M University) "Approximating with kernels on manifolds: better bases and a problem of de Boor".

Mariolina Bartolini Bussi (Università degli Studi di Modena) "Semiotic mediation in the mathematics classroom: Artifacts and signs after a Vygotskian perspective".

Claas Roever (National University of Ireland, Galway) "Commensurations of Thompson's group F" and "Formal languages in group theory".

Volkmar Liebscher (University of Greifswald) "Modelling of (small) gene-regulatory networks by piecewise-deterministic Markov processes".

Biswajit Banerjee (IRL) "An introduction to the material point method".

Tatiana Gvozdeva "Roughly-weighted games with interval as a threshold".

Mina Teicher (Bar-Ilan University, Israel) "Braid Group and its application".

Jiling Cao (AUT) "On normality of Wijsman topology".

Piotr Faliszewski (AGH Institute of Technology, Krakow) "The complexity of campaign management: swap bribery".

Merryn Tawhai "Multi-scale models of perfusion in the lung: where we are at, and the puzzles that we still need to solve".

David Bryant "Drawing metrics: from categories to Kurdistan".

Charles Leedham-Green (Queen Mary, University of London) "On the classification of p-groups".

Alona Ben-Tal (Massey University, Albany) "Mathematics in the clinic: explaining drift in lung volume measurements".

James Avery (University of Copenhagen) "Combining linearly scaling DFT with the finite element method and an application to nanodevices".

Afshin Mardani "Classification of metrisable surfaces: a review".

Suren Basov (La Trobe University) "The inclusiveness of exclusion".

Jean-Marie Aubry (University of Paris East) "On the prevalence of multifractals in some function spaces".

Nick Maggio (Tulane University) "An integrative model of fluid flow in the human uterus".

Tara Brough (University of Warwick) "Groups with poly-context-free word problem".

Yousaf Habib "Avoiding parasitic behavior in G-symplectic general linear methods".

Garry Tee

AUCKLAND UNIVERSITY OF TECHNOLOGY

SCHOOL OF COMPUTING AND MATHEMATICAL SCIENCES

In Semester 2 of 2010 two new staff, Dr Kerry Richardson and Dr Alna van der Merwe, were appointed as part-time lecturers at the School.

Paul Cowpertwait attended the 45th Scientific Meeting of the Italian Statistical Society at the University of Padua in June, where he presented his work on the development of a spatial-temporal rainfall model for the Roma region for urban drainage applications (work funded by Acea SpA and coordinated by the WRc, UK).

Paul also visited University College London where he met with his colleagues Professor Valerie Isham (UCL) and Dr Christian Onof (Imperial) to discuss further developments of the Bartlett-Lewis pulse model for fine resolution rainfall series (Proc. R. Soc. A, vol. 463, 2007).

Paul was also an invited speaker at the Auckland Regional Meeting (July 28th) of the NZ Water modelling special interest group where he gave a talk entitled: "Point process rainfall models: applications in urban hydrology".

In July Andrew Ensor and his PhD student Felipe Lillo both presented papers at the Euro 2010 Operations Research conference in Lisbon, Portugal. Andrew presented "Tight upper bound on the number of optimal paths in weighted coloured-edge graphs" with a counting argument on the number of minimal paths in multimodal networks, and Felipe presented "Analyzing optimal paths in coloured-edge graphs with Euclidean weights" where he explained some experimental results for Euclidean and near-Euclidean graphs.

Professor Jeff Hunter recently chaired the International Organizing Committee of the 19th International Workshop on Matrices and Statistics (IWMS) held at Shanghai Finance University over the period June 5–8. This was one of the largest such IWMS meetings ever held with nearly 200 participants. He also presented a paper at the meeting on some of his new results on "Mixing Times in Markov Chains". Prior to the workshop he led a group of 22 on a pre-workshop 17 day tour of China — visiting Beijing, Xian, Guilin, Yangshou, Chongqing, the Yangtze River, Yichang and Shanghai. It looks as if he has another career as a tour guide looming!

After returning to New Zealand, Jeff left a few days later for Italy where he was an invited speaker in a Mini-symposium on Markov Chains at the annual meeting of the International Linear Algebra Society held in Pisa, Italy, over the period June 20–25. Jeff spoke on his recent research on "Coupling & Mixing in Markov Chains". He returned via the UK, Dubai and Brisbane where he met up with Professor Malcolm Faddy of QUT (who was about to retire!)

Jeff continues on the International Organizing Committee for International Workshops on Matrices and Statistics. He has however stepped aside from its Chairmanship for the next meeting which is to be held in Tartui, Estonia over the period 26 June to 1 July 2011. This meeting is also being held in conjunction with the 9th Tartu Conference on Multivariate Statistics.

In June–July, Farida Kachapova attended the International Symposium on Statistical Methodologies in conjunction with 61st Annual Conference of NZSA at Massey University, Palmerston North, and spoke on "Population monotony coefficient".

Sergiy Klymchuk is on sabbatical in semester 2 this year. In June he gave 2 talks at the Department of Mathematics of Meiji University, Japan and presented a paper at the International Conference on Mathematics Education for Engineers in Germany.

In June Mathematical Sciences graduate Mahmoud Mahmoud was awarded a Build IT PhD scholarship to work with Andrew Ensor and Sergei Gulyaev in Computational Astrophysics.

SEMINARS

Paul Cowpertwait (Auckland University of Technology) "Point process rainfall models: applications in urban hydrology".

Andrew Ensor (Auckland University of Technology) "Tight upper bound on the number of optimal paths in weighted coloured-edge graphs".

Hyuck Chung (Auckland University of Technology) "Vibration of lightweight composite structures with random irregularities".

Felipe Lillo Viedma (Auckland University of Technology) "Analyzing optimal paths in coloured-edge graphs with Euclidean weights".

Jiling Cao

UNIVERSITY OF CANTERBURY

DEPARTMENT OF MATHEMATICS AND STATISTICS

The University of Canterbury Mathematics and Statistics Society (MATHSOC) was formed recently to give Mathematics and Statistics students and staff a social community akin to societies associated with other departments.

Congratulations to Michael Langton, Mareike Fischer and Klaas Hartmann, who graduated with a PhD in Mathematics in April. Our PhD students Beata Faller, Xin Zhao and Scott Graybill

successfully defended their PhDs in May. Beata, whose thesis is entitled "Combinatorial and Probabilistic Methods in Biodiversity Theory", has been offered a postdoctoral fellowship with the distinguished Hungarian mathematician Laszlo Lovasz.

Congratulations to Timothy Candy, Matthew Hendtlass and Ashley Lightfoot, who graduated with an MSc in Mathematics and to Xiangyin Chen and Jason Bentley, who graduated with an MSc Statistics.

Postdoctoral fellow Maarten McKubre-Jordens has been awarded his PhD from Massey University for a thesis entitled "Minimising Weighted Mean Distortion", under the supervision of Gaven Martin. Maarten's very successful oral exam was conducted via Skype between Munich and Albany.

Clemency Montelle was recently invited to serve as an Honorary Member on the University of Canterbury Chapter of the Golden Key International Honour Society. Golden Key is a non-profit academic honour society that recognises and rewards academic excellence. It draws on the top 15 percent of students at universities worldwide and provides members with access to scholarships, study abroad opportunities, career and training material, leadership and community service initiatives. Clemencys selection as an Honorary Member was based on her excellence in teaching and her field of research. Other Honorary Members of the University of Canterbury Chapter include Margaret Mahy, Reuben Thorne and Gary Moore.

Raazesh Sainudiin has been appointed as a Visiting Scientist at the Theoretical Statistics and Mathematics Unit of the Indian Statistical Institute, Bangalore Centre, India.

Congratulations to Jeroen Schillewaert for being awarded a Research in Pairs Fellowship, jointly with Koen Thas, in Oberwolfach.

Congratulations to Clemency Montelle and Michael Plank for their success in the recent round of the Bilateral Research Activities Programme, Royal Society of New Zealand. Their projects are entitled "The History of Numerical Tables and Computational Procedures in Sanskrit Sources" and "Exclusion Process Models for Cell Migration and Proliferation", respectively.

STAFF CHANGES

Ian Coope retired 7 May after 31 years in the department. Both Ian and Neil Watson, who retired earlier in the year, have been appointed adjunct fellows until 2013.

Rob Krausz resigned from his position as a Senior Tutor after only a few months in the department. Miriam Hodge announced her resignation from her Assistant Lectureship to take up a consulting position in Abu Dhabi. The department bade farewell to Leo van Iersel, who has been an Allan Wilson Centre Postdoctoral Fellow for 18 months, working with Charles Semple and Mike Steel. Leo headed back to the Netherlands in June before heading on to Africa to undertake volunteer work.

Elena Moltchanova and Jeanette McLeod accepted offers of lecturing positions in statistics and mathematics, respectively, and will join the department later in the year.

Congratulations to Paul and Angela who welcomed Jessica Emma Browers into the world June 30.

CONFERENCES, WORKSHOPS & VISITS

Another joint Mathematics-Philosophy retreat was held at the university's field station in Westport over the weekend of 14–16 May. These retreats are held a couple of times a year and organized by Philip Catton (from Philosophy) and Clemency Montelle as a forum where students in Mathematics and Philosophy can exchange ideas. This time about 35 staff, students, visitors and assorted family members gathered for walks and talks.

Raazesh Sainudiin presented a 75-minute talk about his recent research at the interface of massive data analysis, algebraic statistics of metric-leaved trees and approximate sufficiency at the 13th Centre for Statistical and Survey Methodology (CSSM) Fellows Research Meeting at Goulburn, Australia on 21 July. Raaz was also invited to present a 45-minute talk on his recent computational statistical research at the International Congress of Mathematicians 2010 Satellite Meeting on Probability and Statistics.

Dominic Lee gave a presentation at the Valencia ISBA conference in Benidorm, Spain, 3–8 June.

Rick Beatson and Igor Rychkov attended the 7th International Conference on Curves and Surfaces in Avignon, France, 24–30 June. Igor's conference attendance followed by a research visit to the University of Rennes was partially funded by a grant from the NZMS. A separate report will appear elsewhere in this newsletter.

Rua Murray, Alex James, John Hannah, Michael Plank, Phillipa Williams, Irene David, Shannon Ezzat and Phil Wilson all attended the Senior Secondary and Undergraduate Mathematical Sciences Workshop "Envisioning the Future" at Auckland University. This two day conference was the main event of the NZIMA Project on mathematics education, with the aim to get senior mathematics

teachers and undergraduate lecturers to talk together about years 12 and 13 at high school and the first two years at university of education for the mathematical sciences.

Douglas Bridges returned from a busy six months' sabbatical based in Munich. During the leave, Douglas went to conferences in Kanazawa (Japan), Siegen (Germany), and — best of all — in the nunnery on Fraueninsel, in the middle of Chiemsee, Bavaria's largest lake.

VISITORS

Recent visitors include:

Trent McDonald (Western EcoSystems Technology, Inc. and University of Wyoming), Koen Struyve (Ghent University, Belgium), Tommaso Proietti (University of Rome, Italy), Harold Moyse (York University), Celina Wong (York University), Josh Collins (Massey University), Xuan Dong (MacQuarie Univeristy) Peter Olsson (Chalmers University), Volkmar Liebscher (Greifswald University, Germany) and Tim Candy (Edinburgh University).

SEMINARS

Angel Ruiz (Vice-President ICMI, Costa Rica) "Pupils' Beliefs About Mathematical Problems in Costa Rican Secondary Schools".

Mina Teicher (Director, Emmy Noether Research Institute for Mathematics, Bar-Ilan University, Israel & Vice-President ICMI) "Braid Group and its Applications".

Thomas Hangelbroek (Texas A&M University) "Surface Splines, the polyharmonic Dirichlet problem and boundary layer potentials".

Carolyn Chun (Victoria University) "Fragility in matroids".

Volkmar Liebscher (University of Greifswald) "Modelling of (small) gene regulatory networks by piecewise deterministic Markov Processes".

Liangyi Zhao (Nanyang Technological University & Max-Planck-Institut Für Mathematik) "On the Low-lying Zeros of Families of L-functions".

Jeanette McLeod (University of Bristol) "Asymptotic enumeration of integer matrices".

Xin Zhao (University of Canterbury) "Extreme Value Modelling with Application in Finance".

Pen Holland (Landcare Research) "Modelling the marsupial menace: when do possums kill trees?"

Keith Martin (Royal Holloway, University of London) "The Cryptographic Toolkit I, II".

Beata Faller (University of Canterbury) "Combinatorial and Probabilistic Methods in Biodiversity Theory".

Glen van Brummelen (Quest University, Canada) "The Mathematical Study of Historical Numerical Tables: Successes, Failures, Issues".

Greg Reid & Niloofar Mani (University of Western Ontario) "Interactive Environment for Differential Equations on Manifolds".

Kevin Hannah (UC, Education Plus) "The Secondary Numeracy Project: Taking the Guesswork out of Mathematics".

Scott Graybill (University of Canterbury) "Modelling nephron dynamics and tubuloglomerular feedback".

Laura Boykin (Lincoln University) "Biosecurity, Species Delimitation-Is There a Holy Grail?"

Elena Moltchanova (National Institute for Health and Welfare, Finland) "The effect of prenatal stress on long-life health. Survival Analysis applied to Helsinki Bombings".

John Bamberg (University of Western Australia) "Hemisystems of Generalised Quadrangles".

Ingram Olkin (Stanford University) "Probabilistic proofs of matrix inequalities".

Ingram Olkin (Stanford University) "Meta-analysis: History and statistical issues for combining the results of independent studies".

Lisa Carbone (Rutgers University) "Discrete Symmetries of Infinite Dimensional Lie Groups".

Konstantin Mischaikow (Rutgers University) "A Combinatorial Framework for Nonlinear Dynamics".

Hans Feichtinger (University of Vienna) "Mathematical Foundations of Gabor Analysis".

Günter Steinke

INDUSTRIAL RESEARCH LIMITED

Nicola Gaston spent June visiting the Freie Universitat in Berlin as part of an ISAT-BRAP grant from the RSNZ. While there, she worked with Dr. Dirk Andrea who visited IRL earlier in the year, and with Prof. Beate Paulus. Apparently, the F.U.

visitor accommodation is particularly pleasant, being located in the grounds of the Berlin botanical gardens.

In May Shaun Hendy visited Stanford University and IBM Almaden in California, giving talks on modelling the growth of carbon nanotubes. In June Shaun also gave a talk at the 12th International Ceramics Congress in Montecatini Terme, a small town about halfway between Pisa and Florence. He also gave a talk at a science communication workshop "Science in the Public" at the University of Waikato and was the speaker at the Hamilton Cafe Scientifique on "Nanotechnology - Opportunity or Threat?". Shaun is also the physics correspondent for Radio New Zealand Nights - he is on roughly every six weeks for a 20 minute chat with Bryan Crump.

Bridget Ingham gave an Invited user seminar at National Synchrotron Light Source, Brookhaven National Laboratory entitled "In situ synchrotron studies of electrochemically deposited ZnO nanostructures". She also conducted experiments while at Brookhaven in collaboration with Mary Ryan (Imperial College) and Tim Burstein (Cambridge) on x-ray absorption spectroscopy of nickel and iron carbide materials for potential fuel cell applications. She also visited the Australian Synchrotron in Melbourne where she worked on real-time experiments following CO2 corrosion of steel with David Williams (Auckland). Warwick Kissling attended the World Geothermal Congress in Bali at the end of April, and gave a talk entitled 'Large scale convective flows with a brittle-ductile transition'. In early April, Dion O'Neale joined the Applied Maths team. Prior to joining he was a post-doc in the mathematics department at La Trobe University, Melbourne, were he worked with Reinout Quispel on geometric numerical integration schemes for differential equations. At IRL he will be working on geothermal reservoir modelling.

Dmitri Schebarchov successfully defended his PhD thesis on 'Mechanisms in carbon nanotube growth: a molecular dynamics study'. As the title suggests, the goal was to advance our understanding of carbon nanotube growth by means of mathematical modelling and molecular dynamics simulations. Dmitri started as a postdoc at IRL in early May. We also say goodbye to Rob Willink, who is leaving IRL after 14 years. We will miss Rob's expertise on statistical matters, and the animated tea-time discussions on a wide variety of subjects which he would often initiate. Rob was also our resident commentator on all things to do with cricket (and our best batsman) and someone else will now have to take over this important responsibility.

And finally, a 'Stop Press' from Krista Steenbergen: I am on the last leg of a two-continent trip that included visits to Bloomington, Indiana and "7.5km west of Ry", Denmark (a school called Himmelbjergegnens Natur-og Idrtsefterskole). In Bloomington, I visited our experimental counterparts - the group that does nano-cluster melting experiments that yield the majority of our data to test our models against. In Denmark, I attended a wonderful summer school hosted by Aarhus Univeristy - 11th Sostrup Summer School on Computational Quantum Chemistry. Upon the suggestion of my wonderful supervisor, I am now taking some time to travel and help my brain recover from the intense pace of the summer school. I spent three days in Scotland - slept in Inverness but drove much of the northern Scottish coastline (photo - near the Stoer Head lighthouse). I am currently in Newcastle-Upon-Tyne ... currently feeling a bit "under-the-weather" but am hoping to visit Harry Potter's Hogwarts (Alnwick Castle) tomorrow ...

SEMINARS

Mike Toney (Stanford Synchrotron Radiation Lightsource) "Nanoscale morphology of bulk heterojunctions in organic photovoltaics".

Warwick Kissling

MASSEY UNIVERSITY

INSTITUTE OF FUNDAMENTAL SCIENCES (MANAWATU)

In June we were very sad to bid farewell to Barbara Holland, who has taken up a new position at the University of Tasmania, in Hobart. Barbara says that on the teaching front she's had to reinvent herself a little — she's in charge of a course she hasn't taught before — but research-wise there are plenty of people that share her interest in phylogenetics. These are scattered throughout the various Schools

at the university, so Barbara plans to start a "Phylogeneticists Anonymous" coffee group, to bring fellow phylogeny addicts together to talk about their phylogeny related problems.

In addition to developing new collaborations at her new home, Barbara is also maintaining strong research links with New Zealand. She and Jeremy Sumner are organising a "Phylomania" conference for November, and have several Kiwis lined up to speak (including David Bryant, Mike Steel, Charles Semple, and Mike Hendy); and in January she will be in Palmerston North to meet with Lara Shepherd and the investigators and PhD students on their Marsden grant. We look forward to seeing her again then.

In June–July, Igor Boglaev gave a plenary lecture at the 5th International Conference on Finite Difference Methods, in Lozenetz, Bulgaria, and attended and spoke at the International Conference on Boundary and Interior Layers (BAIL 2010), in Zaragoza, Spain. Igor is a member of the the BAIL steering committee, and at the meeting this year it was decided that BAIL 2014 will be held in New Zealand. The conference will be organised by IFS, Massey University, with Igor as chair of the Organising Committee.

In July Chris Tuffley attended the 51st International Mathematical Olympiad in Astana, Kazakhstan, as the leader of the New Zealand team. This year's Olympiad was a very exciting one, as New Zealand had its best team result in 23 years at the IMO: we placed 29th out of 96 countries; every member of the team won a medal (a first for us, and giving us more medals this year than countries such as Australia, Japan, Canada, the United Kingdom, ...); and we came home with our fifth and sixth silver medals.

In other staff travel, Charles Little is spending the second half of the year on sabbatical in Brazil, where he will continue his successful collaboration with Marcelo de Carvalho, at the Federal University of Mato Grosso do Sul, Campo Grande.

Two of our postgraduate students are on the brink of completion. Sophie Pack submitted her PhD thesis in June, titled *Monotone iterates for nonlinear singularly perturbed convection-diffusion problems*, and James Benn is about to submit his masters thesis and depart to the States for his PhD studies. James completed his honours degree with us last year, and describes his mathematical tastes as eclectic: he did a summer project in graph theory with Charles Little, and his masters is with Robert McLachlan, on numerical integration. The course of higher-learning never does run smooth, however, and a case of stolen identity or a breach in the fabric of space-time led to a month-long debacle of James proving to the US consulate that he is indeed James, in order to obtain a visa; now that the paperwork is finally sorted, James will be able to depart as planned for the University of Notre Dame, where he intends to study geometric analysis and mathematical physics.

Recent visitors include Dr J Prakash, from the University of Botswana, and Professor Yajuan Sun, from the Chinese Academy of Sciences, Beijing. Dr Prakash is a specialist in fluid mechanics; he visited us for four weeks, and while here worked with Ganes Ganesalingam and Siva Ganesh on discriminant analysis. Prof Sun arrived in July for a six month sabbatical, and will be working with Robert McLachlan on geometric integration.

SEMINARS

Ari Stern (UC San Diego) "Implicit-explicit variational integration of highly oscillatory problems".

Geoff Whittle (Victoria) "Well-quasi-ordering binary matroids".

Brian Moore (University of Central Florida) "Standing Waves in Discrete Inhomogeneous Media".

Volkmar Liebscher (University of Greifswald) "Algorithms for Complexity Penalised Regression".

J Prakash (University of Botswana) "Unsteady MHD Three Dimensional Flow of a Chemically Reacting and Radiating Fluid with Suction".

J Prakash (University of Botswana) "Heat Transfer to Unsteady Magneto-Hydrodynamic Flow Past an Infinite Moving Vertical Plate with Variable Suction".

Christopher Tuffley

INSTITUTE OF INFORMATION AND MATHEMATICAL SCIENCES (ALBANY)

MATHEMATICS NEWS

Gaven Martin spent five blissful weeks at the Hausdorff Institute in Bonn. He gave an invited talk at the Conference Geometry and Dynamics of Teichmüller Spaces and a seminar on the "Four-dimensional Surgery Conjecture and Convergence groups".

Gaven spent a week in Helsinki and gave a joint Aalto University & Helsinki University colloquium on "Deformations of finite distortion and Teichmuller Spaces".

Carlo Laing was an invited speaker at the 8th AIMS Conference on Dynamical Systems, Differential Equations and Applications, held at the Dresden University of Technology, Germany, May 25 – 28. He spent the following week visiting Yannis Kevrekidis at Princeton University.

Carlo was also an invited speaker at the International Workshop on Nonlinear Dynamics on Networks held in Kiev, Ukraine, July 5–9. The following week he attended the SIAM Conference on the Life Sciences in Pittsburgh, giving a poster presentation.

Carlo has been appointed an editorial board member for the new open access Journal of Mathematical Neuroscience

In early June Graeme Wake was an invited speaker and presenter at the National Institute of Education Workshop in Singapore on Mathematical Modelling Outreach. This was the second in the annual series. Patron of the exercise was Professor Lee Peng-Yee of Nanyang Technological University. The workshop finished with a one-day "Lee Peng-Yee Symposium". Lee Peng-Yee was a Lecturer in Mathematics at the University of Auckland in the 1960s.

Graeme then went onto Daejeon, South Korea for the Industrial Mathematics Initiative 2010 meeting, hosted by the Mathematical Sciences Department at the Korea Advanced Institute of Science and Technology (KAIST). He was joined at this meeting by Mark McGuinness (VUW) and Bruce van-Brunt (Massey, PN). This meeting brought to an end the eight years of operation of the team of Visiting Foreign Professors of Applied Mathematics at KAIST. This international team operated under Graeme's leadership and there were a total of six team members involved. Graeme gave three presentations (one of which was joint with the other two Kiwis).

As Director of the Centre for Mathematics in Industry, Graeme is involved in the preparations of the First Malaysian Mathematics-in-Industry Study Group to be held in UTM, Johor Bahru in 14th-18th March 2011. Further details on http://www.\fs.utm.my.

Winston Sweatman participated in the Irish Mathematics-in-Industry Study Group at the University of Limerick and was involved with problems concerning the construction of contact lenses and throat stents. He proceeded to Scotland to visit Glasgow Caledonian University and the University of Edinburgh in Scotland, to work on symmetric four-body systems and modelling star clusters, respectively. He then went to the European Conference on Mathematics in Industry at Wuppertal in Germany where he presented a poster and a talk. These relate to different projects within the steel industry. In between these scientific activities he attended his nephew's birthday party and walked up all the Irish 3000-foot mountains.

In July Alona Ben-Tal traveled to the US where she visited Dr Jeffrey Smith at NIH and Prof Yannis Kevrekidis at Princeton University. She then traveled to the SIAM conference on the life sciences in Pittsburgh where she presented a poster.

In March, Mick Roberts attended the International Conference on Mathematics, Evolution, and Development, at The Chinese Academy of Sciences, Shanghai and gave an invited talk. In June, Mick gave a plenary talk at CMPD3, Computational and Mathematical Population Dynamics, at Bordeaux. On the way he visited Utrecht University to continue collaborative work with Prof Hans Heesterbeek. Joanne Mann also visited Utrecht, and presented a contributed paper at CMPD3.

Mick has been awarded Health Research Council contract for modelling influenza. Mick has been appointed an academic editor for the journal PLoS ONE.

Shaun Cooper visited Prof Heng Huat Chan at The National University of Singapore for two weeks in May. In June, he gave an invited lecture at the Summer School on Quasimodular Forms in Besse, France. The Summer School was held in the Biological Institute of the Université Blaise Pascal, the same place as the first meeting of Bourbaki in 1935. In July, Shaun gave an invited lecture at the Exploratory Experimentation and Computation in Number Theory Workshop at the University of Newcastle, Australia.

In June, Robert McKibbin took part in the 3rd International Conference on Porous Media and its Applications in Science, Engineering and Industry, held in Montecatini Terme, Italy, as an Invited Speaker, talking on "Mass and energy transport in sloping low-temperature groundwater aquifers."

He also delivered the Opening Keynote Talk on the first evening of the meeting, with the title "Through thick and thin: People, places, pressures, permeability and pollutants in porous media." At a venue such as Montecatini Terme, one of the most important thermal centres in Europe for many centuries, it seemed appropriate to provide an overview of geothermal systems (which occur in porous rock, of course). They are an important energy source in many countries, with direct use of

hot groundwater for bathing, etc., as well as exploitation of higher-enthalpy fluids for electricity generation; in the last, Italy led the way in 1904 at Larderello. His talk was illustrative and largely non-technical, although some Mathematics could not be avoided! (It also followed that afternoon's memorable 1-1 draw between Italy and NZ in the FIFA World Cup; if NZ had won, he feels he may have needed a bodyguard.)

Robert was also an Invited Plenary Speaker in the first Conference on Industrial and Applied Mathematics (CIAM 2010) held at Institut Teknolgi Bandung in Indonesia in early July. He spoke on "Some aspects of modelling pollution transport in groundwater aquifers," reporting some preliminary results of current work on modelling non-uniform layered aquifer systems.

The first Les Woods' Memorial Lecture was given at the University of Auckland by Professor Gil Strang from MIT on 21st May 2010. It was jointly sponsored by the University of Auckland and (a little) by IIMS, Massey. The lecture was entitled "Is a random triangle more likely to be obtuse or acute?". The answer, argues the speaker is the former: obtuse. The lecture was given to a packed lecture-hall in spite of the terrible Friday evening weather. It is hoped to make this series an annual one. Les Woods is arguably the greatest real-world applied mathematician NZ has produced and was noted for his work in plasmas and thermodynamics. A DVD version of the talk is available at `https://webdropoff.auckland.ac.nz/cgi-bin/pickup/3db1452c72c31b80f8140b734d7de783/267784`

Syaza Abdul Latif, a MSc candidate from Malaysia, completed her Masters degree with second class (division one) honours in Mathematics in July. Her thesis was titled "Analysis of a dynamical system of animal growth and composition" under the supervision of Graeme Wake and Kumar Vetharaniam (AgResearch, Hamilton). She is now enrolled in a PhD in Mathematics funded by Malaysia. Her topic will be modeling the effectiveness of biocontrol agents.

Chanakarn Kiataramkul returned to Thailand in August to prepare her PhD thesis in "Modelling Targeted Fetal Growth" which is a project supported by the CoRE National Research Centre for Growth and Development at the Auckland Medical School. Here she worked under the supervision of Graeme Wake and Alona Ben-Tal and she is expected to submit her thesis in Mahidol University, Bangkok in December 2010. Before she left Chanakarn gave a presentation on her work at the NRCGD Science Symposium in early August.

STATISTICS NEWS

... will be included in the next newsletter.

SEMINARS

Alona Ben-Tal "The construction of dynamical systems near homoclinic and heteroclinic bifurcations".

Frederick Lam "Eisenstein series and elliptic functions on $\Gamma_0(10)$".

Joanne Mann "Modelling influenza using a string representation for the virus".

Graeme Wake "Non-local calculus and cell-growth".

Shaun Cooper and Marie Fitch

UNIVERSITY OF OTAGO

DEPARTMENT OF MATHEMATICS AND STATISTICS

Congratulations to John Harraway on being awarded one of two University of Otago annual teaching excellence awards. This award is presented for outstanding capability as a teacher in Statistics. To qualify, John had to prepare a substantial portfolio including student and peer evaluations. John was presented with $10,000 by University of Otago Vice-Chancellor, Prof Sir David Skegg during a function in the Clocktower Building.

There is much change happening at Otago these days by some long-serving staff members moving into retirement or phased retirement and new staff being appointed to replace them. The hard part is keeping a good balance between youth and experience!

Dennis McCaughan retired in April after 38 years of sterling service to the Department. We - very much including his students - have all appreciated his idiosyncratic approach to academic matters, especially to teaching. His style was evident in recent interviews on National Radio, and in his parting Irish-mathematical joke, the punch line of which was "and if you can guess how many there are you can have both of them". He held many administrative positions in the Department, including Director of Studies for First Year students, and his experience will be hard to replace. The Department's best wishes go to Dennis and Kim for many happy years of retirement.

A warm welcome to Prof Iain Raeburn who joined the Department in April as a Research Professor (Pure Maths). Iain's profile can be seen in the 'New Colleagues' section.

We were sorry to lose Chris Fonnesbeck who left the Department in May to return to the USA. Chris was here for a relatively short time having joined the Department in February 2008, nevertheless making a significant contribution to the Statistics group. We wish Chris, Shana and (Kiwi son) Zachary all the best for the future.

Marguerite Hunter joined our administration team in June. Leanne and Lenette are very pleased to welcome her! Marguerite has had previous University experience in The Queen's University of Belfast and at the Christchurch Department of Medicine and is settling in well. One of Marguerite's tasks is assisting with organizing the Colloquium in December.

The between-semester break provided an opportunity for conference travel, of which several staff members took advantage.

Both Astrid an Huef and Iain Raeburn were invited speakers at the Conference on Selected Topics in Operator Algebras and Non-commutative Geometry, held at the University of Victoria from June 28 to July 2. The focus of the conference was on non-commutative topology, index theory, representation theory, C*-dynamical systems from number theory, and symmetries and equilibrium. The conference was funded by the Pacific Institute for the Mathematical Sciences (PIMS) via the Collaborative Research Group program. After the conference, Astrid and Iain stayed on for a week to continue their collaboration with Prof. Marcelo Laca.

Robert Thompson attended the 19th International Conference on General Relativity and Gravitation (GR19) in Mexico City from 5–9 July and presented work on "Dielectric Analog Spacetimes" done in collaboration with Jörg Frauendiener. Taking advantage of being in North America, Robert subsequently spent a week at Duke University working with Steve Cummer on generalizations of transformation optics, and another week at Tufts University visiting his PhD thesis advisor, Larry Ford, exploring how to test the quantum stability of extremal black holes.

Florian Beyer attended the General Relativity conference (GR19) in Mexico city from 3–10 July. Following the conference he was invited to visit the University of Paris from 12–30 July to collaborate with a research colleague, P. Le Flock.

John Harraway attended the International Conference on Teaching Statistics 8 in Ljubljana, Slovenia from 10 – 17 July. John was Chair of the International Programme Committee which had structured a programme involving all aspects of statistics education ranging from school to tertiary level, teacher training, assessment, outreach into society, the use of official statistics, new technology, statistics education research and projects for international cooperation. There were over 500 people attending from 50 countries, the Programme was well received and the conference facilities in Ljubljana were excellent. The next ICOTS Conference will be held in Flagstaff, Arizona, in July 2014.

After Slovenia John went to Iceland representing the International Association of Statistics Education at the two-day Council Meeting of the International Statistical Institute. The next World Statistics Congress is to be held in Ireland next year while in 2013 it was confirmed for Hong Kong and in 2015 for Brazil.

Robert Aldred was also in Iceland. He attended the 10th Nordic Combinatorial Conference (NORCOM2010) in Reykjavik, from 25–28 May.

Mihály Kovács was an invited participant at the Stochastic Partial Differential Equations: Approximation, Asymptotics and Computations Workshop in Cambridge, UK from 28 June – 2 July. He also was an invited speaker at CSM — The First Conference of PhD Students in Mathematics, Szeged, Hungary from June 29 – July 2, 2010. In June, he also visited Chalmers University, Gothenburg, Sweden to collaborate with Prof Stig Larsson.

Richard Barker, Jamie Sanderlin and David Fletcher attended the International Statistical Ecology Conference 2010 in University of Kent, Canterbury, UK from 3–11 July. Canterbury, especially the Canterbury Cathedral, has attracted thousands of pilgrims over the years, as documented in Geoffrey Chaucer's "Canterbury Tales". In the spirit of travelling, a group of about 100 statistical ecologists and numerical biologists convened to discuss various topics, such as mark-recapture methods, survey design, spatial trends in animal density, and monitoring biodiversity. Richard was a plenary speaker and Jamie presented a paper entitled, "State-space model for abundance, survival and recruitment from molecular parentage data".

David Fletcher, Jamie Sanderlin and Richard Barker have made sojourns of varying length to attend the International Statistical Ecology Conference, held at the University of Kent, at Canterbury from 3–11 July. Canterbury, especially the Canterbury Cathedral, has attracted thousands of pilgrims over the years, as documented in Geoffrey Chaucer's "Canterbury Tales". In the spirit of pilgramage, a group of about 100 statistical ecologists and numerical biologists convened to discuss various topics, such as mark-recapture methods, survey design, spatial trends in animal density, and monitoring biodiversity. As well as our three staff members, there was a very strong New Zealand contingent; all but one of the workshops were presented by kiwis and two of the four plenary speakers were

from Dunedin. We might have to plant a forest to offset our carbon footprint.

A Korean colleague of John Clark, Prof Hong Kee Kim, visited from February to July and Tim Williams, a past PhD graduate, visited for three weeks in May.

SEMINARS

David Fletcher & Peter Dillingham "Coverage Properties of Model-Averaged Confidence Intervals".

Robert Yuncken (University of Victoria, Canada) "Index theory for $SL(3, C)$".

Jean Roydor (University of Orleans, France) "Isomorphisms of tensor algebras of topological graphs".

Robert Aldred " Edge proximity and matching extension in planar graphs".

Jamie Sanderlin "State-space model for abundance, survival, and recruitment from molecular parentage data".

Gareth Hegarty "A tale of two equations".

Tomas Bird " Integrated analysis of a mark-recapture data set for native fish in the Murray River".

Astrid an Huef "Crossed products of C*-algebras, Morita equivalence and imprimitivity theorems".

Austina Clark "The use of Chi-square test when observations are independent".

Tim Williams (University of Bristol) "Dispersion relations for floating elastic plates".

Peter Green "Calibrating pseudoproxies".

Ralf Peter "Wave Maps".

STAT 480 PRELIMINARY PRESENTATIONS

Darren Alexander "Analysis of correlated binary data".

Yahya Aljohani ""Statistics Anxiety": measuring its level and impact on choice of statistical software".

Ross Haines "Bayesian modelling of eye-tracking data".

Crystal Symes "Multivariate analysis used to estimate stature of Prehistoric Thai people from Ban Non Wat".

MATH 480 FINAL PRESENTATIONS

Padarn Wilson "Constructing a Brownian motion".

Fabien Montiel "Wave Scattering by Ice Floes: Model and Experimental Design".

Mihály Kovács (University of Orleans, France) "Unbounded functional calculus for group generators and subsurface hydrology".

Brett McClintock (Centre for Research into Ecological and Environmental Modelling, University of St Andrews, Scotland) "General animal movement and migration models using multi-state random walks".

Anastassia Baxevani (University of Gothenburg, Chalmers University of Technology) "Spacetime models for moving surfaces with an application to significant wave height fields".

Laimonis Kavalieris "Estimating Trends".

Iain Raeburn "Filters, direct limits and wavelets".

Lenette Grant

UNIVERSITY OF WAIKATO

DEPARTMENT OF MATHEMATICS

We congratulate Kevin Broughan on his recent promotion to Professor. Besides his significant contributions in teaching and in research (in areas such as dynamical systems, mathematical software, optimisation, and in recent years, number theory), Kevin has made major contributions to the department and the university. He served as Chairperson of Department for six years. He played major roles both in the setting up of the School (now Faculty) of Computing and Mathematical Sciences and in the establishment of the Bachelor of Engineering degree at the university. The department celebrated Kevin's success in April with drinks and nibbles.

We also congratulate Nick Cavenagh on his promotion to Senior Lecturer. This columnist apologies to Nick for not mentioning this in the previous column. In April, Nick visited collaborators at

Continues after centrefold ...

IAN DOUGLAS COOPE

Associate Professor Ian Coope (Department of Mathematics and Statistics, University of Canterbury) has chosen to take early retirement from May 2010 and his departure will leave a big gap in our high level teaching and research in the field of computational matrix algebra.

Ian hails from the Manchester area and crossed the Pennines to attend Leeds University in 1968. At Leeds he was awarded an Akroyd Scholarship prize in 1969, and in 1971 he graduated with a B.Sc. Honours degree in Computational Science and Mathematics. Ian then went on to complete his doctorate in Unconstrained Optimization in 1976, and a Research Fellowship in the Department of Mathematics at The University of Dundee. At Dundee he joined an illustrious group of numerical mathematicians which included such names as A. R. Mitchell, D. F. Griffiths, J. D. Lambert, G. A. Watson, and Roger Fletcher. The list of Senior Visiting Fellows from that era reads like a Who's Who of the international field of Numerical Mathematics, and Dundee was recognised as a centre of excellence for Numerical Mathematics.

In 1979 Ian was among several candidates from Dundee applying for the post of Lecturer at the University of Canterbury. Obviously he got the job, but has since been joined in Christchurch by others from the "Dundee mafia" like David Wall at Canterbury, and Keith Unsworth at Lincoln.

Ian arrived in Christchurch in 1979 with his statistician wife, Pat, to join the ranks of the Department of Mathematics and Statistics under the larger than life headship of Professor Gordon Petersen.

Ian is one of those somewhat rare breed of person who is not only a talented mathematician but is also an excellent computer scientist who can grasp the essential aspects of algorithms and produce code that can fit on the back of an IBM 80 column card. He is also very good at tackling other peoples' problems which is evidenced by his collaborative research in electrical engineering, bioengineering, robotics, statistics, and with other mathematics colleagues. His main area of research has been in optimization where he has published extensively with Chris Price, now a colleague in the Department.

His standing in the world of optimization in particular, is such, that he has held invited positions in the NATO Advanced Research institute on Nonlinear Optimization at Cambridge, Australian National University, in Germany and Hong Kong

He has received University of Canterbury Erskine awards, and held visiting positions at AERE Harwell; University of Waterloo; Numerical Optimization Centre, University of Hertfordshire; Government Geotechnical Division, Hong Kong; Simon Fraser University, Vancouver; ANU and the School of Computing, Univerity of Leeds.

Ian has also been the catalyst for visits to Canterbury, often multiple, of leading figures in his field. It is an indication of his standing that people such as Alistair Watson from Dundee, John Dennis from Rice University, Mike Powell from Cambridge, Charles Broyden from Essex University, Peter Graves-Morris

from the University of Southampton, and Phillipe Toint from Namur in Belgium came to Canterbury as Erskine Fellows.

Ian has not neglected his administrative commitments and was a member of the University's Academic Board, and the Discipline Committee. He has been a stalwart of the University Staff Club, and was President 1996 to 1997. He has served on numerous Departmental and latterly, College of Engineering committees.

He has made a contribution to the New Zealand Mathematical Society, being first Associate and then Editor for the newsletter, a member of the Council and organiser of the NZMS pre-doctoral Thesis Competition (1983/84)

He also served as a Moderator for the New Zealand Education and Scholarship Trust (NZEST) for the Mathematics with Statistics paper from 1992 to 1997.

Ian has flirted with kayaking, and has had a few close calls here, and now plays tennis. He and Pat have opened their home to friends and colleagues over the years, and have ensured contact between current and retired staff of the University and with a wider circle of friends and colleagues. His wife Pat continues her work as a statistician and their son, Scott, currently works in the USA and daughter, Jenny, in England.

In his own words Ian's research interests lie mostly in the general areas of computational mathematics and optimization. He has published work and engaged in consultancy in: the theory, development and applications of numerical methods for constrained and unconstrained optimization, nonlinear equations, function approximation, semi-infinite programming, spectral methods, linear algebra, curve interpolation, nonlinear splines and statistical computing. Ian was involved with MATLAB from the very first FORTRAN code to the latest versions. Ian successfully managing to shoe horn the FORTRAN version, obtained from Cleve Moler, on to the first early PCs. He is in his element in producing very compact but efficient code.

In recent times he has taken up a keen interest in the mathematics of finance, and given several courses on this topic. He has an impressive list of graduate students and is currently supervising Rachael Tappenden in her work on applications of computational matrix algebra techniques, including optimization, to image and signal reconstruction. This work is part of a surge in world wide interest in applying matrix algebra techniques to algorithms for Magnetic Resonance Imaging and Computer aided Tomography.

Since retiring in May, Ian now holds an Adjunct Associate Professorship with the University of Canterbury.

Bob Broughton
David Wall

Local news continues ...

the University of Queensland while in June, he attended the Combinatorics 2010 conference held in Verbania near Milan. At the conference, Nick presented a talk titled "Non-extendable latin cuboids".

Congratulations are due to Qizhi (Zoe) Zhou on her recent successful PhD defence. Zoe's thesis was titled "Multiply perfect numbers of low abundancy" and her Chief Supervisor was Kevin.

Ian Hawthorn is the Acting Chairperson of Department for the remainder of the year while Tim Stokes is on study leave. Tim will be working with Larry Forbes at the University of Tasmania, Marcel Jackson at La Trobe University, and Graeme Hocking at Murdoch University. He will also do some work with some collaborators in Canberra. While in Australia, Tim will attend the Annual Australian Mathematical Society Meeting at the University of Queensland and the Victoria Algebra Conference at Monash University. So Tim gets to spend time in four of the six states of Australia as well as one territory.

The other member of the department on study leave is Ernie Kalnins. He left for overseas in mid-July. His first four weeks will be in Dubna, Russia (to work with George Pogosyan) followed by about three weeks in Yerevan, Armenia. During this time, he will attend the *XIV International Conference on Symmetry Methods in Physics*. This conference will be held in Tsakhkadzor which is a popular resort about 50 km from Yerevan. After that, Ernie will spend about five weeks at the University of Minnesota working with his long-time collaborator Willard Miller Jr. While there, Ernie will help organise and attend the *Symmetry, Separation, Super-integrability and Special Functions (S^4) Conference* which is being held to mark Willard's retirement.

Another traveller was Yuri Litvinenko who made a short visit in June to his collaborators at the University of New Hampshire.

SEMINARS

H. Cohl (University of Auckland) "Fourier and Gegenbauer expansions for fundamental solutions of the Laplacian and powers in $\mathbf{R}^d$ and $\mathbf{H}^d$".

R. Hosking (University of Adelaide) "From cold regions to modern railtracks".

T. Forbes (University of New Hampshire) "Predicting the onset of solar eruptions".

Stephen Joe

VICTORIA UNIVERSITY OF WELLINGTON

SCHOOL OF MATHEMATICS, STATISTICS AND OPERATIONS RESEARCH,

Te Kura Mā-tai Tatauranga, Rangahau Pūnaha

Much of this news entry concerns reports of peoples' travels, along with great news of one new (unpaid) arrival: Mark Johnston and his wife Emily, along with big brother Hamish (actually, really big for someone who has just turned two!) welcomed the safe arrival of Benjamin Johnston on 05/05/10; we already see the potential for some maths games with birth dates ... Benjamin took only one hour to arrive following his mum's check in at the hospital, so he's already known for his speed out of the blocks. Congratulations to Mark and Emily! Between teaching and parental leave, Mark managed to fulfill his pre-planned conference visit to the 2010 IEEE World Congress on Computational Intelligence (18-23 July in Barcelona) where he was an author/presenter on two papers. Mark's co-authors included one of our Honours students, Thomas Liddle; Thomas quite recently got married, so congratulations to Thomas too!

Estate Khmaladze and Ivy Liu both attended the Joint Statistical Meetings in Vancouver (31 July to 5 August). Ivy organized and chaired a session on Novel Methods for Extended Case-Control Designs, while Estate presented some work in a session on Model Diagnostics. Besides his JSM session, Estate also visited nine other countries on a recent two-month trip overseas (finishing with the JSM), during which he gave a total of 14 presentations in a very busy schedule. Stefanka Chukova also spent time abroad recently, including a visit to Bulgaria between our trimesters. Fortunately Stefanka came back to continue leading the preparation for APARM 2010 this coming December (see http://msor.victoria.ac.nz/Events/APARM2010/), which is shaping up nicely.

John Haywood organized the Wellington leg of the New Zealand Statistical Association Visiting Lecturer tour in early July. This year the NZSA Visiting Lecturer was Prof Ingram Olkin (Stanford University), who's visit was associated with the NZSA / Statistical Methodologies Conference, 29 June-1 July 2010 at Massey University, Palmerston North (see http://nzsa_cdl_2010.massey.ac.nz/). John also presented a paper at the NZSA Conference and then brought Ingram down to Wellington on 1 July. Prof Olkin gave four talks while in Wellington: a Wellington Statistics Group talk on 2 July (Meta-Analysis: History and statistical issues

for combining the results of independent studies), a repeat of that first talk to the Ministry of Education on the morning of 5 July, an afternoon talk on 5 July to Statistics New Zealand (Measures of heterogeneity, diversity and inequality), and a lunch time seminar at Victoria University of Wellington on 6 July (Life distributions in reliability and survival analysis). See the attached photo of John and Ingram taking a breather while discussing wavelets (or something similar...) at Lake Ferry on 4 July, during Ingram's Wellington visit. Some details of the rest of Ingram's NZ tour are here: http://stats.org.nz/visiting_lecturer_2010.shtml.

In June and July Richard Arnold had an extended visit to Spain and the UK. Richard attended the Bayesian Valencia conference (the last of its kind: from now on ISBA will have a Bayesian meeting every two years, without returning to a particular location). Shirley Pledger and Richard presented a workshop and two papers at the International Statistical Ecology Conference at the University of Kent, UK (at which all four workshops were presented by New Zealanders!). The workshop was on capture-recapture models for open populations (with age structure and heterogeneity of capture probabilities), and the papers were on clustering of species and habitats in community ecology using finite mixture models. Also in June, Shirley gave a seminar at Murdoch University, Australia, on pattern-detection models in community ecology.

Mark McGuinness managed to swap some NZ winter for some Irish summer for a couple of weeks in June, while attending the 75th European Study Group with Industry at the invitation of the University of Limerick. It was warm and mostly dry while he was there. The problems were very interesting, especially one on coating stents with silicone. The results of the weeks deliberations on the stent problem are summarised in a powerpoint presentation made by Mark, which may be viewed at the link http://homepages.ecs.vuw.ac.nz/~markm/STENTS.

Jonathan Crook (supervised by Mark McGuinness) successfully defended his PhD entitled "Ice Growth and Platelet Crystals in Antarctica", and is settling in the central North Island and looking for work. Another successful PhD defense was made by Giorgi Kvizhinadze (supervised by Estate Khmaladze) on "Large number of rare events: Diversity analysis in multiple choice questionnaires and related topics". Congratulations to them both!

In other student news, we have recently been joined by several new mathematics PhD students. Michael Snook is working with Dillon Mayhew on complexity theory in matroids. Alan Williams, who successfully completed his MSc earlier in the year, is continuing under Geoff Whittle's supervision on a PhD in matroid connectivity problems, while Mohammed Daher has begun a PhD with Peter Donelan on singularities of robot manipulators. Te Ropu Awhina, the Maori-Pasifika whanau for science, architecture, design and engineering students, recently had its 11th birthday party at the University marae. MC for the evening was Maths and Stats graduate Hautahi Kingi, currently completing BCA Honours in Economics. Awhina and Maths and Stats alumna Kirikowhai Mikaere, now working at Statistics New Zealand, was a guest speaker and two current MSOR students, Robbie Main and Ashton Lindsay, reported on their summer research scholarship work.

Another happy new arrival in the School, but this time one who we are paying, is Dan Turetsky, who joins us for two years as a postdoctoral fellow working with Noam Greenberg and Rod Downey, supported by their Marsden Grants. Dan works in mathematical logic (particularly aspects of computability theory) and recently received his PhD from the University of Madison, Wisconsin under the supervision of Steffen Lempp. Another of Rod Downey's recent postdocs, Asher Kach, has gone to the University of Connecticut to take up a further postdoc. Rod himself has recently returned from 6 weeks overseas at Chicago, Madison and Notre Dame, where he spoke at the Logic, Computability and Randomness conference, along with Noam Greenberg and Rod's PhD student Adam Day. Recent visitors to the School include Andre Nies from Auckland (visiting Rod and Noam) and James Oxley (Louisiana State), Jim Geelen (Waterloo) and

Rhiannon Hall (Brunel), all visiting Geoff Whittle and Dillon Mayhew.

In news from the Wellington Statistics Group, John Haywood has resumed as WSG convenor, replacing David Harte who has been the convenor since 2007. Recently David has been out of New Zealand for some lengthy periods and he felt it was time to step down from the role. John was previously convenor from 2001 until 2006. Alistair Gray continues to be the treasurer and Leigh Roberts usually organises the refreshments, while John maintains the group's mailing list. WSG talks since the last NZMS newsletter were given by:

2 July 2010, Ingram Olkin (NZSA Visiting Lecturer)
26 May 2010, Shirley Pledger and Richard Arnold

Further details of these talks can be found on the NZSA Local Groups web page: http://stats.org.nz/local_groups.shtml. This web page also contains contact details for the group (including the mailing list web interface), names of sponsors, and details of forthcoming (or most recent) talks.

SEMINARS

For abstracts for these seminars (including MSOR Colloquia), put an appropriately-old date in the School's seminar web page: http://msor.victoria.ac.nz/Events/Seminars.

Mike Wright (Lancaster University) "Automatic Parameter Setting for Simulated Annealing".

Mariolina Bartolini Bussi "From Descartes' Dream to Kempe's Theorem and beyond: linkages and algebraic curves".

Noam Greenberg (VUW) MSOR Colloquium, "What is Model Theory?"

Mina Teicher (Bar-Ilan University) "Braid Group and its application".

Mike Newman (University of Ottawa) "Quantum chromatic numbers of graphs".

Carolyn Chun (VUW) "Fragility in matroids".

Jean-Marie Aubry (visiting VUW) "Introduction to multifractal analysis".

Alok Goswami (Indian Statistical Institute) "An old theorem of Young revisited".

Mark McGuinness (VUW) MSOR Colloquium, "Exploding Rock".

Ingram Olkin (Stanford University; NZSA 2010 Visiting Lecturer) "Life Distributions in Survival Analysis and Reliability: Structure of Semiparametric Families".

John Harper (VUW) "Electrophoresis of gas bubbles".

Bethan Cropp & Jozef Skakala (VUW) "General polarization modes for the Rosen gravitational wave" and "Semi-analytic results for quasi-normal frequencies".

Mark McGuinness (VUW) "Coating Stents with Silicone".

Rob Goldblatt (VUW) MSOR Colloquium, "What is a Co-Algebra?"

John Duncan (King's College, Cambridge) "Monstrous moonshine and quantum black holes".

Dillon Mayhew (VUW) "Binary matroids with no $M(K3,3)$-minor".

John Haywood

FEATURES

Results of the 51st IMO, Astana, Kazakhstan

This year's team returned an outstanding performance at the International Mathematical Olympiad, held in Astana, Kazakhstan from 5th to 14th July. The team and their results were as follows (individual scores out of 42):

Student	Score	Percentile	Award
Malcolm Granville (Auckland Grammar School)	22	85.46	Silver medal
Tom Yan (Auckland Grammar School)	21	79.65	Silver medal
Stephen Mackereth (King's College)	16	61.40	Bronze medal
Robert Zhang (Auckland Grammar School)	16	61.40	Bronze medal
Sicong Zhang (Auckland International College)	16	61.40	Bronze medal
Yuan (Edward) Wang (Hillcrest High School)	15	56.20	Bronze medal
Team result: 29th of 96 countries	106	70.83	

This was a record result for New Zealand on several levels. The team's percentile ranking of 70.83 is our highest in 23 years at the IMO, beating our previous high of 59%, achieved in 1994, 2002 and 2005. This was the first year in which every member of our team won a medal, and our medal count of six this year is higher than that of several countries ranked above us, including Japan (7th), Canada (13th), Australia (15th), Romania (16th), and the United Kingdom (25th). Finally, this is only the fifth year in which we have won a silver medal, and the first year in which we have ever won two. All involved in the New Zealand Mathematical Olympiad programme are extremely proud of the team's performance this year.

Full results can be found at `imo-official.org`, and reports and photos from the IMO as it unfolded can be found on the New Zealand Mathematical Olympiad Committee website, `www.mathsolympiad.org.nz`.

Photo: The team outside the Palace of Independence, after the Closing Ceremony. From left: Stephen Mackereth, Sicong Zhang, Tom Yan, Malcolm Granville, Yuan (Edward) Wang, Robert Zhang. The team were accompanied by Christopher Tuffley (Massey University, Manawatu) as leader; Ilya Chevyrev (University of Auckland) as deputy leader; and May Meng (King's College) as Team Manager.

Christopher Tuffley

NEW COLLEAGUES — IAIN RAEBURN

Iain Raeburn joined the University of Otago in April as a professor in pure mathematics. Iain was born and schooled in Edinburgh, and went to university there (and finds Dunedin just like home, except sunnier and maybe more Scottish). He obtained his PhD in 1976 from the University of Utah, and after a year in Canada moved to Australia, where he worked at the Universities of New South Wales, Newcastle, and Wollongong.

Iain's main expertise lies in functional analysis and operator theory, but he is especially interested in their interactions with other areas of mathematics. In recent years, for example, he has studied operator algebras arising in graph theory, number theory and harmonic analysis. In particular, Iain's work on the operator algebras associated to directed graphs has influenced researchers all over the world, and, most recently, has opened up a new area of inquiry to algebraists and ring theorists.

Iain has active collaborations with researchers in New Zealand, Australia, Canada, the US, Norway, Brazil and Malaysia, and is keen to bring as many of them to Dunedin as possible. He also has a strong record of mentorship: he has supervised 12 PhD students, and has helped many postdocs and younger colleagues develop into strong and influential researchers.

Lennette Grant

MASSEY UNIVERSITY

Institute of Information and Mathematical Sciences
Private Bag 102-904, NSMC, Auckland, New Zealand
Phone: 09 414-0800 Fax: 09 441-8136

CENTRE FOR MATHEMATICS IN INDUSTRY

Masters' Degree Scholarships

Two Masters' degree scholarships (approximately $15,000 total for each, which includes fees) are offered to selected candidates who enrol in the thesis year of the new Master of Sciences program majoring in Industrial Mathematics and Statistics beginning in February or July 2011. Candidates must meet the academic criteria for enrolment in the two-semester program.

These scholarships are available through the Centre of Research Excellence (CoRE): the National Research Centre of Growth and Development (NRCGD) http://www.nrcgd.org.nz based at the Auckland Medical School.

Applications can be received by the program contact person: Professor Graeme Wake g.c.wake@massey.ac.nz by 20th December 2010 (for Semester one) and by 18th June 2011 for a semester 2 start, and from whom enquiries can be made. The thesis topic will be focussed on detailed aspects of implementation on algorithms already developed on "targeted fetal growth". One award is to deal with the data analysis and so will need a statistical background; the other will be concerned with the computational and mathematical extension of the existing theoretically-based algorithm.

The awards will be confirmed after enrolments are complete, and will be paid in instalments.

An application form is available on request and on the IIMS website http://www.massey.ac.nz/massey/learning/departments/iims/student-information/postgraduate-study/postgraduate-scholarships.cfm

Applications must be accompanied by an academic record and one external referee contact or reference.

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CONFERENCES

NZMS SUPPORT FOR CONFERENCE ATTENDANCE

CURVES AND SURFACES CONFERENCE

Recipient: Igor Rychkov – University of Canterbury.

Quadrennial conference "Curves and Surfaces" took place in Avignon in the last week of June this year. It had the atmosphere of a large general assembly due to the scope and number of participants, predominately European and American with smaller numbers from around the world. Two people came from New Zealand.

The conference brought together mathematicians and practitioners in the fields of approximation theory for geometry modeling, scattered data processing, discrete differential geometry, topology, mesh-based geometry processing, image processing, multi-scale analysis, and computer graphics.

It was crucial to carefully work out a customized itinerary of attendance among plenary lectures and parallel mini-symposia. Below are but a few highlights of my itinerary. An unmissable session on radial basis function featured Holger Wendland's talk on multiscale analysis using compactly supported RBF and Rick Beatson's advancement report on the fast multipoles RBF - the only method practically realizable on large scattered data without sacrificing the interpolating power of the global RBF. Surprisingly, the progress in RBF methodology seemed to remain largely unnoticed by the computer graphics community living on triangular meshes.

One interesting field being developed on meshes is the discrete differential geometry which now has discrete equivalents for most of the continuous d. g. machinery. It can be used not only on spatial but also on "temporal" discretizations, the discretization of the configurational space manifolds. Mathieu Desbrun talked about the geometry of dynamical systems and the importance and benefits for computer animation and fluid similuators to use symplectic numerical integrators for the equations of motions, which is actually common knowledge in computational physics.

Another important subject was the multiscale analysis connected to subdivision schemes and wavelets. Johannes Wallner's overview was particularly helpful. The data is downscaled by applying a low-pass filter or otherwise intelligently decimated. Then it is upscaled. In the case of mesh-based geometry the upscaling operator is just one of the smooth subdivision schemes. The difference between the original and the more regular upscaled data is called detail. Therefore the data can be represented as the coarsest representation and a series of decaying details. Incidentally, in terrestrial modeling we call the detail coefficients "roughness".

Several interesting works were presented on subdivision surfaces, parametric patches, smooth functions modeling over triangular meshes, and many new types of splines. A session was dedicated especially to open source software for geometry processing. Although mostly concerned with mesh-based geometry some of the packages either declare it as a future direction or already example shaders for point-based visualization.

A paradigm shifting talk by Michael Elad outlined the history and state-of-the-art in image denoising and inpainting. There are two terms in the energy functional to be minimized there: relation to the given data normally taken as squared residues, and the "prior", or the regularization term, essentially imposing our model on the image. The "prior" has evolved from energy to smoothness and robust statistics to total variation to wavelet sparsity to the current "sparse & redundant" representation featuring a large dictionary matrix. The dictionary encodes what features could possibly be in the image and is trained on many similar images. In other words, the model is learnt from the data domain itself and not imposed

by the modeler. In that way one can hope to remove the noise while preserving fine details and edges essential to the image and included in the dictionary of features.

I presented our first iteration on multiscale analysis of terrestrial surfaces. A ground model is built using a hierarchy of local slopes blended with the partition of unity tensor-product B-splines. The finer details are kept as orthogonal distances and the corresponding elevation and roughness maps show the landscape and the texture evolution. The idea to have it as a poster proved fruitful as it prompted a few discussions and constructive critique which was exactly what this project needed.

After the conference I paid a research visit to Dimitri Lague's group at University of Rennes. We worked towards adapting my models and software to his terrestrial laser scanner data. We held a workshop on point cloud processing centered on CloudCompare project. Dimitri, a couple of his students, and a laser scanner will arrive to the University of Canterbury and will stay for 1 year surveying different river sites, such as Rangitikei River and Avon river estuary. I was given some typical datasets with a task to adapt our methodology to his types of terrains so that we are ready to collaborate with him further when he comes to our University.

I would like to conclude this report with a curious geological story. Dimitri took me to one of his scanning sites which happened to be the famous Mont Saint-Michel. It has amazing 15-meter high tides which deposit a lot of sediment and as the Couesnon River was prevented to swipe its original estuary by the new permanent road the Mont Saint-Michel is quickly ceasing to be an island. The picture shows the laser scanner at work and the castled island in the background.

GENE GOLUB SIAM SUMMER SCHOOL

Recipient: Rachael Tappenden – University of Canterbury

I recently attended the inaugural Gene Golub SIAM Summer School on Numerical Linear Algebra which was held from 7–18 June, 2010, in Selva di Fasano, Italy. The summer school composed of four, short, graduate-level courses given by world leaders in this field.

In the first week Charles Van Loan (Cornell University) and James Demmel (University of California, Berkeley) gave their two courses. The course by Charles Van Loan was based on Matrix Tensors which are being picked as the 'next big thing' in terms of matrix manipulation. Interest in tensors has recently reignited and there are many open problems in the matrix tensor setting. Although some of the ideas involving matrix tensors seem simple, they are difficult to put into practice and many standard matrix concepts cannot be translated to matrix tensors.

In contrast, the course by Jim Demmel had much more of a computer science flavour. This course focused on how to store and move data efficiently. We proved theoretical bounds on the amount of data movement needed for certain matrix computations and found algorithms which attained these lower bounds.

In the second week two new lecturers, Margaret Wright (Courant Institute, New York University) and Volker Merhmann (Technical University Berlin) arrived to give their two courses. The course by Volker Merhmann focused on the Matrix Polynomials and the associated generalised eigenvalue problem. We looked at ways of determining the eigenvalues of these polynomials and the information provided by the infinite eigenvalues.

The course by Margaret Wright on optimization was the course most related to my own research. She emphasized the strong association between linear algebra and optimization. This course focused on Linear Programming problems, in particular, we considered the Simplex method and Interior Point Methods. Although these are taught in undergraduate courses, we considered them in more detail which allowed for more in depth understanding of the importance of these algorithms and Linear Programming in general.

All of the courses had associated exercise sessions which provided an opportunity to reinforce the ideas taught in lectures and to interact with the lecturers themselves.

In addition to the official summer school courses the students also organised and participated in daily roundtable sessions. These were held each evening after dinner and were an opportunity for students to give short presentations about their research so that students could find out who was working in a similar area and further discussions could eventuate. I found several other students who were working on compressed sensing and the roundtable lead to to some very interesting and helpful discussions.

I would like to take this opportunity to thank the New Zealand Mathematical Society for granting me funding to attend this prestigious summer school. I was very lucky to be one of only 50 students selected to attend and the support of the NZMS allowed me to make the most of this wonderful opportunity.

A group photo of the conference delegates. (Jim Demmel is in the front row, second from the left and Charles Van Loan is in the second row from the back, fourth from the right).

CONFERENCE ANNOUNCEMENTS

12th ASIAN LOGIC CONFERENCE

Victoria University, Wellington 15–20 December, 2011
Home Page: `http://msor.victoria.ac.nz/Events/ALC2011/WebHome`

Registration is now open.

The 12th Asian Logic Conference will be held in Wellington, New Zealand from 15–20 December 2011. This meeting will be held jointly with a meeting of the Australasian Association for Logic (AAL).

There will be an additional workshop for students on the 14th featuring the conference Tutorial Speakers.

The Asian Logic Conference series is sponsored by the Association for Symbolic Logic, and the meetings are major international events in mathematical logic. The series features the latest scientific developments in the fields in mathematical logic and its applications, logic in computer science, and i philosophical logic. It also aims to promote mathematical logic in the Asia-Pacific region and to bring logicians together both from within Asia and elsewhere to exchange information and ideas.

Tutorial Speakers

- Zlil Sela (Hebrew University)
- Martin Grohe (Humboldt Univ. Berlin)

Plenary Speakers

- Hiroakira Ono (JAIST) (joint AAL)
- Mic Detlefsen (Notre Dame) (joint AAL)
- Akito Tsuboi (University of Tsukuba)
- Noam Greenberg (Victoria University Wellington)
- Greg Hjorth (Melbourne University)
- Isaac Goldbring (UCLA)
- Grigor Sargsyan (UCLA)
- Wu Guohua (NTU, Singapore)

Special session organisers

- Feng Qi and Hugh Woodin (set theory)
- Geoff Whittle and Daniel Marx (logical aspects of graphs and matroids)
- Andre Nies (algorithmic randomness)
- Antonio Montalban and Rod Downey (logical aspects of algebraic structures)
- Edwin Mares and Rob Goldblatt (modal logic)

Program Committee

- Arai Toshiyasu
- Byunghan Kim
- Qi Feng
- Sergei S. Goncharov
- Greg Restall
- Rod Downey
- T.Arai
- Yang Yue

The local organizing committee consists of Rod Downey, Noam Greenberg, Colin Bailey and Ginny Whatarau.

2011 NZIMA / NZMRI SUMMER WORKSHOP — DYNAMICAL SYSTEMS

January 9-14 2011, Raglan, New Zealand
Organisers: Vivien Kirk, Rua Murray, Arno Berger
Web: http://www.math.canterbury.ac.nz/NZMRI2011/

The theme of the 2011 NZIMA/NZMRI Summer workshop is Dynamical Systems. The meeting will feature short courses of lectures by outstanding invited speakers, with plenty of time for informal interaction.

The workshop is aimed at the general mathematical community, and attendance by graduate students is particularly encouraged. Thanks to generous sponsorship by NZIMA through the NZMRI, participation is free for NZ based mathematicians. Further details can be got from the meeting website (including travel grant information for students).

SPEAKERS

Vitaly Bergelson	–	Combinatorial ergodic theory
Marty Golubitsky	–	Coupled systems, symmetry and synchrony breaking
Yannis Kevrekidis	–	Multiscale computation
Bernd Krauskopf	–	Numerical methods and visualisation for dynamics
James Meiss	–	Hamiltonian dynamics
Hinke Osinga	–	Numerical methods and visualisation for dynamics
Martin Wechselberger	–	Multiple timescale dynamics

REGISTRATION

(Deadline: **October 1, 2010**)

By email: rua.murray@canterbury.ac.nz

Please note: space is limited at the conference venue, and places are being filled in order of registration.

NEW ZEALAND MATHEMATICS AND STATISTICS POSTGRADUATE CONFERENCE 2010

The NZMASP Conference will be held at the University of Canterbury Field Station, Westport, from 22–25 November, 2010. For further details please see http://www.math.canterbury.ac.nz/nzmasp2010/.

Registration is now open for all Masters and PhD students. The deadline for registration is **17 September, 2010**. Please note that the conference is limited to the first 50 delegates to register.

New Zealand Mathematical Society Colloquium

University of Otago, Dunedin, New Zealand

Tuesday 7 December - Thursday 9 December 2010

The annual Colloquium, for the first time under the auspices of the New Zealand Mathematical Society, will be hosted in 2010 by the Department of Mathematics and Statistics at the University of Otago.

The programme consists of five plenary sessions together with contributed talks representing, we hope, a wide range of contemporary pure and applied mathematics and related areas such as mathematics history and education. The plenary speakers are:

John Butcher (Auckland) - ANZIAM Lecturer
Michael Eastwood (ANU)
Helmut Friedrich (Albert Einstein Institute, Golm)
Andre Nies (Auckland) - NZMS Lecturer
Jacqui Ramagge (Wollongong) - NZIAS Lecturer

There will be an informal reception on Monday evening to welcome those attending; registration formalities can be completed then or on the following morning.

On Tuesday there will be a second reception at which posters will be exhibited and informally presented by their authors. ANZIAM has kindly donated a prize of $200 for the best poster submitted by a student.

An excursion has been arranged for Wednesday afternoon. The Colloquium dinner will be held on Wednesday evening at the historic and picturesque Larnach Castle on Otago Peninsula. Transport to and from the dinner will be provided.

The Aitken Prize for the best student talk will be presented at the Colloquium dinner.

The final session is expected to finish by 3.15pm on Thursday.

Registration and abstract submission can be done via the conference website:
http://nzmathsoc.org.nz/colloquium

The deadline for abstract submission and early-bird registration is 31 October.

Graduation ceremonies in Dunedin are scheduled for 4 and 11 December, so if you intend to arrive early or leave late it might be worth booking your accommodation early.

Please direct any enquiries to:
Ms Marguerite Hunter: mhunter@maths.otago.ac.nz

We very much look forward to seeing you there. Peter Fenton, Convener

NOTICES

UPDATE ON THE NZIMA

We'd like to update you on developments with respect to the New Zealand Institute of Mathematics and its Applications (the NZIMA), since the outcome of the 2006/07 Centres of Research Excellence (CoRE) selection round.

First, as youll know, we have had a full suite of progammes in action, and have been supporting a large number of postgraduate research students across the country, as well as the annual summer meeting and some high- profile visitors. Also we have been pleased to be able to build up our "MathsReach" resource (see `www.mathsreach.org`) and publish our twice-yearly bulletin NZ-IMAges, each showcasing a wide variety of people involved in mathematical and statistical activities in New Zealand.

On the other hand, our status and funding as a CoRE is scheduled to run out in June 2011, and we have been actively considering the future of the NZIMA.

The CoRE selection decision regarding the NZIMA in 2007 was based on a number of perceived flaws, mostly concerned with governance, strategy and added value (benefits over and above what could be achieved by an increase in funding to existing activities).

There was absolutely no question about research excellence. In fact a recent analysis by the Ministry of Education shows that the NZIMA produced 21% of the reported publications by CoREs in A* or A-rated journals over the three years 2004/06/08 (on a budget of about 5% of the total CoRE budget), and that 70% of the NZIMA's reported publications over those three years were in A* or A-rated journals (compared with 51% for other CoREs). The CoRE selection process, however, put a lot more emphasis than expected on wider benefits to New Zealand, over and above pure research excellence.

With these things in mind, last year we assembled a new Governing Board, to provide us with a refreshed vision and strategy, with good contacts and influence beyond the mathematical sciences, and to help expand the focus of the NZIMA towards benefits and outcomes as part of a broader recognition of research excellence.

The current membership of the new board is as follows:

- Len Cook CBE CRSNZ (former head of Statistics NZ), chair
- Marti Anderson (Professor of Statistics, Massey University)
- Grant Guilford (Dean of Science, University of Auckland)
- Peter Hunter (Director, Auckland Bioengineering Institute)
- Peter Jackson (former PVC (Engineering), University of Canterbury)
- Alan Lee (Deputy Dean of Science, University of Auckland)
- Neil Quigley (DVC(Research), Victoria University of Wellington)
- Jeanette Saunders (HoD Mathematics, St Cuthberts School, Auckland)

We will be appointing one or two more non-university people, including at least one from New Zealand business/industry. Board members are bing appointed for two year terms.

Our new Board has met twice so far this year, and we are pleased to report that it is highly committed to the continued advancement of the NZIMA and its valuable activities, and to achieving success in the

next CoRE selection round (which is expected to take place in 2012/13).

One of the main tasks ahead is to make a much better case demonstrating how much, and increasingly, the mathematical and computational sciences contribute to higher levels of GDP, through innovation in methodologies, systems and practices in all fields of science, commerce and public life. Another will be to analyse and set priorities for the great variety of activities undertaken by the NZIMA, in a way that gives more explicit recognition to its short-term, long-term and indirect contributions. A third one will be to seek opportunities for bridging finance to help sustain the NZIMA through to the next CoRE round, through a small number of partnerships in tightly-focussed areas of application and from sources within the university sector.

We wish to develop a new framework for the NZIMA, that will better enable planning, organisation and communication of the NZIMAs activities, and increase the chances of success in the next CoRE round. The new Board is very confident of our ability to do this. In fact members of the Board believe there is an emerging consensus about the need for an entity like the NZIMA in New Zealand, but we will need your help to build up the arguments to reinforce it.

Over the period July to September this year we are engaging with the mathematical sciences community in New Zealand, to discuss these plans and hear ideas about how some of the above aims can be achieved. As at the end of July Marston Conder and James Sneyd have visited each of the university centres in Albany, Dunedin and Christchurch, and are expecting to visit Hamilton, Palmerston North, and Wellington, as well as holding meetings in Auckland, to discuss these issues with you.

We look forward to this interaction and will appreciate any positive contributions you can make. We are particularly keen to hear ideas for the future vision, activities and structure of the NZIMA, as well as gather strong evidence for its continuation, based on the benefits it has brought and will bring to New Zealand.

Len Cook (NZIMA Board chair)
Vaughan Jones (NZIMA Co-director)
Marston Conder (NZIMA Co-director)

CALL FOR NOMINATIONS FOR NEW ZEALAND MATHEMATICAL SOCIETY COUNCIL POSITIONS

Nominations are called for Councillors and an Incoming Vice-President on the New Zealand Mathematical Society Council.

The term of office of a Council member is three years. Council members may hold office for two (but no more than two) consecutive terms. Existing Councillors may be nominated for the position of Incoming Vice-President.

Nominations should be put forward by two proposers. The nominee and the two proposers should be current Ordinary or Honorary members of the New Zealand Mathematical Society. The nominations, including the nominee's consent, should be forwarded by Wednesday the 1st of December to the New Zealand Mathematical Society Secretary.

If nominations are sent by email, the two proposers and the nominee should each send separate email messages to the Secretary.

Alex James

NOTICE OF THE ANNUAL GENERAL MEETING

The Annual General Meeting of the New Zealand Mathematical Society will be held during the New Zealand Mathematics Colloquium at Otago University, 7–9 December, 2010.

Items for the Agenda should be forwarded by Wednesday the 1st of December to the New Zealand Mathematical Society Secretary.

Alex James

STUDENT SUPPORT TO ATTEND MISG 2011, RMIT UNIVERSITY, MELBOURNE

The New Zealand Mathematical Society is offering grants towards the travel costs of students who attend the Mathematics and Statistics-in-Industry Study Group Workshop (MISG) at RMIT University, in Melbourne from 6 – 11 February 2010. To be eligible students must be enrolled at a New Zealand University and are expected to be a member of the New Zealand Mathematical Society.

To apply for funding, students should complete the usual NZMS financial application form available at http://nzmathsoc.org.nz/ marking the entry:

"Type of Assistance Sought": Travel to MISG11

You will require all the following:

1. Contact details (name, address, email).
2. Current programme of study.
3. Details of society membership of NZMS.
4. Estimated total expenditure (including a breakdown of this expenditure).
5. A supporting statement from Supervisor, Head of Department, or similar.

The form is to be sent to the address below before the deadline of Wednesday, 1 December, 2010. The amount of money available for individual students will be decided shortly after that date.

Details of further support available for accommodation local costs and other information will be found on the MISG internet site `http://www.rmit.edu.au/maths/misg`.

(Please note that MISG funding is separate from the usual process of financial support provided by the NZMS and will have no effect on future eligibility for such support.)

Details of membership of the NZMS are available at http://nzmathsoc.org.nz/?subscriptions.

Alex James

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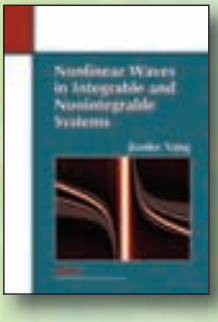

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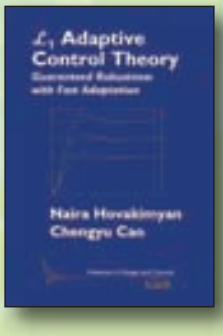

A comprehensive overview of the recently developed $\mathcal{L}_1$ adaptive control theory, including detailed proofs of the main results. The key feature of the $\mathcal{L}_1$ adaptive control theory is the decoupling of adaptation from robustness. The architectures of $\mathcal{L}_1$ adaptive control theory have guaranteed transient performance and robustness in the presence of fast adaptation, without enforcing persistent excitation, applying gain-scheduling, or resorting to high-gain feedback.

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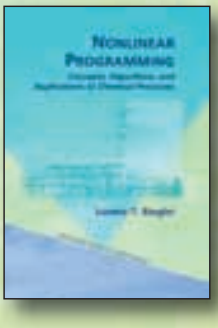
Nonlinear Programming: *Concepts, Algorithms, and Applications to Chemical Processes*

NEW

Lorenz T. Biegler



This book addresses modern nonlinear programming (NLP) concepts and algorithms, especially as they apply to challenging applications in chemical process engineering. The author provides a firm grounding in fundamental NLP properties and algorithms, and relates them to real-world problem classes in process optimization, thus making the material understandable and useful.

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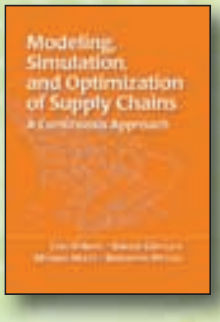
Ciro D'Apice, Simone Göttlich, Michael Herty, and Benedetto Piccoli



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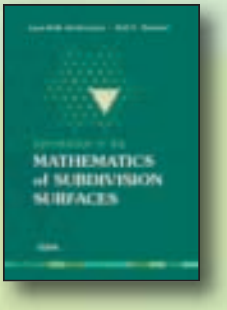
Lars-Erik Andersson and Neil F. Stewart



A careful and rigorous presentation of the mathematics underlying subdivision surfaces as used in computer graphics and animation. It explains the concepts necessary to easily read the subdivision literature and organizes subdivision methods in a unique and unambiguous hierarchy in order to provide insight and understanding. Includes exercises and projects; course material is available online.

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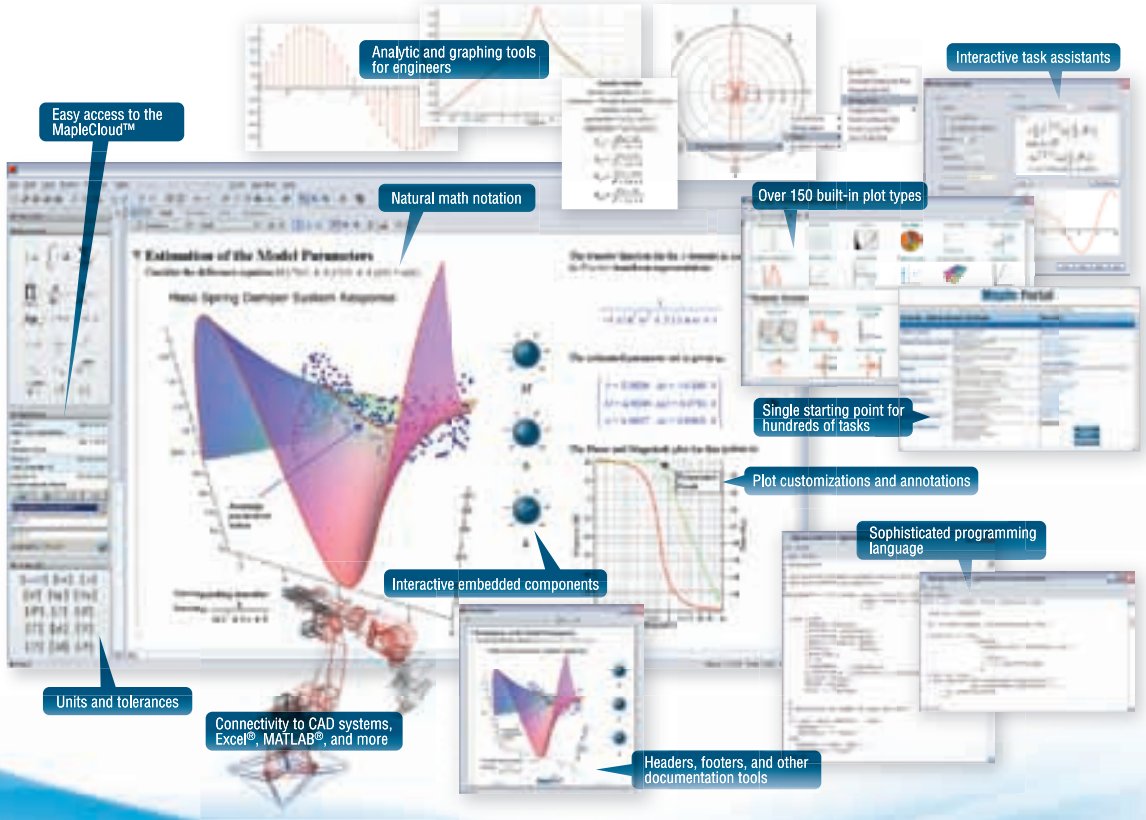

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