

CHASE REPORT

NEWSLETTER OF THE DEPARTMENT OF MATHEMATICS AND STATISTICS

MAY 2001

DALHOUSIE UNIVERSITY

HALIFAX, N.S.

CONGRATULATIONS TO OUR AWARDS WINNERS

Sir William Young Gold Medal in Math

Matthew Heller

University Medal in Statistics

Adam Webber

Dalhousie Governor's Award

P.K. Jacky Li

Ralph & Frances Lewis Jeffery Scholarship

Matthew Heller & Deidre Maher

Barry Ward Fawcett Memorial Prize

Paul Sheridan

Ken Dunn Memorial Prize

James Michael

Katherine M. Buttenshaw Prize

Sarah McCurdy

Bernoulli Prize

Karin Stoner

Waverly Prize

Lili Zhu

Emil and Stella Blum Award in Mathematics

Adam Clay

Ellen McCaughin McFarlane Prize

Adam Clay

NSERC AWARD WINNERS

Congratulations to the following students who received
NSERC POSTGRADUATE Scholarships

NSERC PGS-A awards: *Matthew Heller*
Adam Webber

NSERC PGS-B awards: *Dan Kehler*
Tara Taylor

NSERC PDF: *Carl Hickman*

Honours - Mathematics

Dennis Debay

Honours

Matthew Heller

First Class Honours

Jacky Li

Honours

Deidre Maher

First Class Honours

Philippe Maheux

Honours

Honours - Statistics

Takayoshi Ikeda

First Class Honours

Sofia Mosesova

Honours

Geoffrey Solloum

First Class Honours

Adam Webber

First Class Honours

GRADUATE STUDENTS

Recent Graduates:

October 2000 Convocation:

Mathematics

Dalya Abdulla, M.Sc.

Claudia Centazzo, M.Sc.

Toinette MacNeil, M.Sc.

Tara Taylor, M.Sc.

Statistics

Nick Barrowman, Ph.D.

Joanna Mills, Ph.D.

Sanjoy Sinha, Ph.D.

Martin Perry, M.Sc.

Paul Scott, M.Sc.

May 2001 Convocation:

Mathematics

Megan Dewar, M.Sc.

Yanjing He, M.Sc.

Mark Jarvis, M.Sc.

Kyle Schmeisser, M.Sc.

WELCOME TO OUR UNDERGRADUATE SUMMER RESEARCH STUDENTS

Jason Hicken received an NSERC Undergraduate Student Research Award and will be working with Professors Keith Thompson and Dan Kelly.

James Michael received an NSERC Undergraduate Student Research Award and will be working with Professor Robert Milson.

GRADUATING HONOURS STUDENTS

Paul Sheridan received an NSERC Undergraduate Student Research Award and will be working with Professor Karl Dilcher.

David White received an NSERC Undergraduate Student Research Award and will be working with Professor Keith Johnson.

Adam Clay received a John Richard Freeman Warr Summer Undergraduate Research Award and will be working with Professor Richard J. Wood.

Jacky Li and Mary MacLachlan are summer research students working with Professor John C. Clements.

Laura Gergeley is working with Professor Jason Brown as a summer research student.

Michael Lejeune and Atreya Basu are summer research students working under the direction of Professor Jeannette Janssen.

ALUMNI NEWS

Rajendra Rai (Ph.D. 1980) and *Lily Rai* (M.Sc. 1980), wrote to say they are working in India. Rajendra is with the Ministry of Defence, Government of India.

Dr. Sanjay Rai, (M.Sc. 1988), was awarded the Jacksonville University's Award for Excellence in Scholarship & Professional Growth this Spring. In addition he has been appointed as the Chair of the Department of Mathematics beginning Fall 2001.

Annik Martin, (M.Sc. 1999) who did her Masters degree under the supervision of Dr. Shigui Ruan has a teaching position with the University of New Orleans.

Robert Aucoin (B.Sc. 1989) has taken up the position of Co-ordinator of Distance Education at the University of Alberta in Edmonton.

Todd Grimm (M.Sc. 1999) has accepted a position as Software Designer within the Optical Networks group at Nortel Networks in Ottawa.

Nigel Higson, (Ph.D. 1986) Department of Mathematics, Pennsylvania State University has been elected to the Academy of Science of the Royal Society of Canada. Nigel is a leader in the field of operator algebras in Hilbert space, together with its applications to geometry, topology, and the representation theory of groups. He has made definitive contributions towards the solution of deep conjectures due to Novikov, and to Baum and Connes. His work will have lasting influence. Congratulations Nigel!

FACULTY NEWS

Dr. Chris Field, was awarded a new contract (\$4,200) with the Marine Fish Division, Bedford Institute of Oceanography. Chris will be working on modeling distribution of births using stage duration and temporal staging data.

Chris gave an invited talk at the Symposium in honour of Frank Hampel's 60th birthday in Zurich.

Dr. A.C. Thompson attended a Conference in Honour of David Larman at the University College London early April. He then attended a Convexity meeting at the German Mathematics Research Institute in Oberwolfach Germany before going to Vienna to give a talk at the Technical University.

Dr. Richard Nowakowski has been appointed to serve on the NSERC Reallocation Committee for GSC 336 and 337.

Richard has been appointed Chair of the Senate Review of Computing Science.

Shigui Ruan was an invited speaker at the MATH 2000 conference in Hamilton, at the 957th American Mathematical Society Meeting in Toronto, and at the workshop on Epidemiological Models and Population Dynamics in Xian, China.

Shigui has become a member of the MITACS project "Mathematical and Computer Modeling of Epidemics with Public Health Applications" and received a grant of \$16,667 for the period 2000-2001. Dr. Wendi Wang from Xian Jiatong University, China, is his MITACS postdoctoral fellow.

Congratulations go to *Pierre Stevens*, Director of the Math Stats Learning Center received the first Motivator of the Year award presented by the Undergraduate Math Stats Society.

Welcome and congratulations to *Dr. Dorette Pronk* who joins us after receiving a 2000 NSERC University Faculty Award.

Welcome and congratulations to *Dr. Andrea Fraser* who joins us after receiving the 2001 NSERC University Faculty Award.

Chris Field, Ed Susko, and Bruce Smith are co-investigators in the Atlantic Genome Centre proposal "A comprehensive understanding of prokaryotic genome evolution and diversity: from genomics to metagenomics", which has funded by Genome Canada for 5.3 million dollars. The overall goal of this project is to develop reliable and robust methods to construct phylogenetic trees based on nucleotide or amino acid sequences that may have evolved under non-stationary conditions, including lateral gene transfer and varying rates of evolution.

Christophe Herbinger, a new cross-appointment with Biology, and Bruce Smith are co-investigators on a strategic grant entitled "Genome and QTL mapping of traits related to growth and adaptation to climate change in black spruce", funded for five years at \$138K/year.

Chris Field and *Bruce Smith* are co-investigators on the MITACS project "Statistical Modeling and Analysis of Complex Traits in Human and Natural Populations", funded at \$150K/year. Yong Song will begin working on this project as a PDF in June.

Chris Field has been appointed as a Lansdowne Visitor at the University of Victoria for the next academic year. He will be visiting University of Victoria for at least one week and will give a public lecture and a lecture in the Department of Mathematics and Statistics.

The NSERC equipment grant has been awarded to *Drs. Field, Hamilton, Smith* and *Susko*.

DISTINGUISHED LECTURE

The first Distinguished Lecture in the Department of Mathematics and Statistics was given by *Gregory J. Chaitin* of the Thomas J. Watson Research Center in New York on March 19, 2001. Gregory was invited to write the first volume in the Cambridge University Press series on theoretical computer science, his 1987 monograph "Algorithmic Information Theory". In addition, three volumes of his papers have been published by World Scientific and his three most recent books, all published by Springer-Verlag, are "The Limits of Mathematics", "The Unknowable". His most recent book is "Exploring Randomness".

220 people attended the lecture which was well received by the audience.

PROFESSORS EMERITUS

The Department is delighted to announce that the Board of Governors has approved the appointments of Peter Fillmore and Heydar Radjavi to the rank of Professor Emeritus.

Heydar Radjavi, Ph.D.
Professor of Mathematics

Heydar Radjavi received both a B.Sc. and a B.A. from Tehran University in 1956. Heydar graduated from Minnesota with an M.A. in 1960 followed by a Ph.D. in 1962. After Minnesota he spent a year at the Institute for Advanced Study in Princeton. This was followed by alternate years in North America (first in Illinois and thereafter in Toronto) and in Iran at Shiraz University. In 1973 an appointment as Killam Senior Research Fellow at Dalhousie began his permanent stay in Canada and at Dalhousie. Since 1975 he has been Professor of Mathematics here.

The motivation for much of his mathematical work is the invariant subspace problem. The resulting output is prodigious. He has over 118 articles in a wide variety of journals from about 10 different countries.

He has been editor of the Canadian Mathematical Bulletin and Vice President of the Canadian Mathematical Society as well as serving twice on the NSERC grant selection committee. He has supervised one Master's and six Ph.D. students.

At Dalhousie he and Peter Fillmore have been the joint Chiefs of the operator theory group. Their international reputation has contributed immensely to the stature of the department here.

Peter A. Fillmore, Ph.D., FRSC
Professor of Mathematics

Peter Fillmore graduated from Dalhousie University in 1957 with an Engineering diploma, an Honours degree in Mathematics and the Sir William Young Gold Medal. He received his M.A. in 1960 and Ph.D. in 1962 from the University of Minnesota. He was at Indiana University in Bloomington from 1964 to 1972. During those eight years he progressed from Assistant to Full Professor.

In 1972 he was persuaded to return to Nova Scotia and in 1973 was appointed Killam Research Professor at Dalhousie. He has remained at Dalhousie since then as Professor of Mathematics and, from 1987 to 91, as Chair of the department.

His mathematical work is mainly in operator theory and he has written two books. He is best known as the "F" in BDF theory, a remarkable theory of extensions of C^* -algebras which initiated the connection between K-theory and operator theory. It was after this work that he was elected to the Royal Society of Canada.

He has served the Canadian mathematical community in many ways, e.g., Vice President and President of the Canadian Mathematical Society, on various committees of the CMS, NSERC, the Royal Society of Canada, and the Fields Institute. In 1983 he was a Canadian delegate to the International Mathematical Union.

APICS ANNUAL MEETING

The 24th APICS 2000 MATH/STAT/CS Annual Conference was held at Dalhousie University, October 20-22, 2000. The local organizers were Alan Coley, George Gabor, Shigui Ruan (Chair), and Art Sedgwick. The Blundon Lecture, entitled "Mathematics and the Mind", was presented by Joachim Lambek from McGill University. Larry Bretthorst from Washington University and Morven Gentleman from Dalhousie gave the Special Guest Lectures. Other activities included special sessions, student sessions, AARMS Sunday sessions, and MATH/CS student competitions.

DEPARTMENT NEWS

Congratulations to *Professor Anthony C. (Tony) Thompson* on graduating from the "working class". He retires this July. Tony has been active in all aspects of University life including Chair and Director of the department, serving as a member of the DFA negotiating team, just to name three of the many committees he has served on. His latest book on Geometry has garnered him many invitations to visit Europe. We hope he will still have time to visit the department.

GRADUATE STUDENT SOCIETY NEWS

The Math/Stat Graduate Student Society has had a busy year. Our second year of weekly Friday coffee hours has been a resounding success, once again, being well attended by faculty, staff and students. We helped usher in the Christmas season and celebrated the end of the fall term with a department pizza luncheon. Celebrations for the end of the winter term were combined with pre-Easter festivities. We had a "count the eggs in the jar" contest, plus the first ever Chase Building Easter egg hunt. Our lucky contest winners were Honours students James Michael and Adam Webber. The society will have a much more low-key profile over the summer months, but shall return in full force for the 2001/2002 year.

This year's executive has been:

President	Nancy Clarke
Vice President	Dale Garraway
Secretary/Treasurer	Patricia Moorhead
Department Liaison	Dan Kehler

UNDERGRADUATE STUDENT SOCIETY NEWS

Games Night:

New this year, Games Night gave undergrads, grads, and faculty a chance to test their game playing ability. Math and Stats students, along with students from other departments such as Computer Science and Philosophy, came to learn new games and the theory and strategy behind them. Dr. Nowakowski introduced and explained the games and then the competition began. MASS supplied the pizza and prizes.

Society Night:

Dinner at the Greek House was hosted by MASS for students and faculty. This year was the first, but MASS hopes to make the Math and Stats Society Night a tradition. Draws were made during the night for MASS paraphernalia.

MASS Motivator of the Year:

Students were asked this year to nominate the one person that has most motivated and encouraged their learning and/or continued learning of Math or Stats. Of all the very worthy nominees, MASS determined that Pierre Stevens was most deserving of the award judging by the number of nominations and the comments made supporting him on nomination forms. Pierre was presented with the award at a special ceremony. MASS also gave Pierre a personal gift.

Following MASS's lead, the Physics society is initiating a similar award for members of the Physics department. MASS would love to see all student societies creating awards of this sort in their departments.

Pub Crawls:

Every semester MASS has a Pub Crawl. This past fall we were happy to have APICS participants join us for a night on the town.

Intramural Sports:

Although the number of Math and Stats majors may be smaller than Biology or Chemistry, our presence was felt with team captain Jacky Li at every sporting event we participated in.

2001-2002 MASS Executive:

President James Michael
Vice President Paul Sheridan
Treasurer Johnny Metlej
Secretary Jamie Carter
Events Coordinator Elizabeth Logan

CONFERENCES

Dr. Richard Nowakowski is organizing a Game Theory Conference, to be held at Dalhousie, July 23, 2001. For more information, please see Dr. Nowakowski's webpage.

Dr. Shigui Ruan is organizing an International Workshop on Dynamical Systems with Applications to Biology to be held in Cape Breton, August 2 – 6, 2001.

SUMMER CAMPS

We are pleased to again be hosting the Department of Mathematics and Statistics Math Camp for Black Children the week of July 8 – 13, 2001. This will be followed by the Canadian Math Society Math Camp for Gifted Children the week of July 16 – 20, 2001.

VISITORS TO DEPARTMENT

Dr. M. Albert (New Zealand), *Dr. D. Wolfe* (USA) July 15-27, and *Dr. J.P. Grossman* (USA) June 1 - August 31.

Dr. Guoqi Qian visited the Department from LaTrobe University in Melbourne, January - April, 2001.

Dr. Benlong Xu of the Department of Mathematics, Qufu Normal University, Shandong China is here as a Visiting Associate Professor this year. He will be working with Dr. K.K. Tan.

Dr. Terry Smith spent the year here while on sabbatical from Queen's University. He gave a course on Statistical Consulting to several of our undergraduate and graduate students.

A former graduate, *Dr. Guoqi Qian*, now of LaTrobe University, visited for the winter term and taught our Data Analysis course.

Dr. John Robinson, from the University of Sydney, visited for a portion of the fall term. Both Drs. Qian and Robinson worked on research projects with Chris Field.

Dr. P.G. Sankaran, from Cochin University of Science and Technology, visited R.P. Gupta for the summer and fall terms, and taught one of our summer statistics courses.

GRANTS

The Statistics Division were awarded a \$70,000 NSERC equipment grant .

Genome Canada has approved an award of \$10 million to fund two projects, one of which is the proposal with Doolittle, Field, Mulligan, Ranalla, Smith and Susko to study Comparative Prokaryotic Genome Evolution.

OBITUARY

We regret to announce the death of our dear colleague and friend *Dr. Patrick Noble Stewart*, 57. Pat was a Mathematics Professor and retired in January this year. He died on April 15, 2001 at Halifax, Nova Scotia.

He grew up in Hodgeville, Saskatchewan, attended Royal Roads Academy, graduated first class honours from the University of British Columbia; Masters, University of California at Berkeley (Woodrow Wilson Fellow); Ph.D under N.J. Divinsky at the University of British Columbia; Post-Doctoral Studies at the University of Glasgow, Scotland. He began his career at the University of South Australia, Adelaide and joined the faculty at Dalhousie University in 1972. His career included terms as Department Chair, Atlantic Vice-President of the Canadian Math Society and President of the International Jury for the 36th International Mathematical Olympiad. He was widely published in collaboration with national and international colleagues. He was honoured as the first recipient of the Faculty of Science Excellence in Teaching Award, 1991 and chaired the Mathematics and Statistics group for the Atlantic Provinces Inter-University Committee on the Sciences. His service to the University Community included executive responsibilities with the Dalhousie Faculty Association and work towards improving the instruction of Mathematics in Nova Scotia High Schools, particularly for disadvantaged and minority youth.

Dr. Stewart is survived by his wife Margaret Jane (Tomkins) of Ottawa, sons Jeffrey, Robin and Riley, and his brother John of Gibsons, British Columbia and sister Lorna of Edmonton, Alberta. Donations in his memory may be made to the

Dalhousie University, Department of Mathematics and Statistics.

STATISTICAL CONSULTING SERVICE

The Statistical Consulting Service, with full-time employee *Wade Blanchard* under the supervision of *Chris Field*, has had another busy and productive year. Along with numerous smaller projects, the Service has participated in three major studies. "In collaboration with Dr. Sara Iverson, from the Department of Biology, we have worked on the problem of estimating mammal diets on the basis of their fatty acid signatures and the signatures of various prey species. Results of this study could have a major impact on the management of fish stocks, for example. We have also been involved in the design and analysis of several clinical trials to study vaccine efficacy conducted by Dr. Scott Halperin, from the Clinical Trials Research Center at the IWK-Grace Health Centre. Another study with Dave Greenberg of BIO is focusing on the analysis of historical sea level records for the Bay of Fundy, and validation of models of sea level change."

PUZZLES

edited by *Dr. S. Swaminathan*

I. Mathematician Mom is sewing a missing button on her little daughter's coat. The little daughter wants to play with the buttons. "O.K.," says Mom, "line up nine buttons in a row. Taking turns we will each take any number, from 1 to 5, of buttons from the row. When all buttons are picked up the one who has an odd number of buttons is the winner." What picking strategy can the little girl adopt to be certain to win?

II. "Are those your children that I hear playing in the garden?" asked the visitor. "There are really four families of children," replied the host. "Mine is the largest, my brother's family is smaller, my sister's is smaller still, and my cousin's is the smallest of all. They are playing drop the handkerchief," he went on; "they prefer baseball but there are not enough children to make two teams. Curiously enough," he mused, "the product of the numbers in the four groups is my house number, which you saw when you came in. "I am something of a mathematician," said the visitor, "let me see whether I can find the numbers of children in the various families." After figuring for a time he said, "I need more information. Does your cousin's family consist of a single child?" The host answered his question, whereupon the visitor said, "Knowing your house number and knowing the answer to my question, I can now deduce the exact number of children in each family." How many children were there in each of the four families?

Answers in our Website next week.

CHASE REPORT

Is published for alumni and friends of the Department of Mathematics & Statistics, Dalhousie University.

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We welcome your suggestions and comments

