



**Dalhousie
University**
Inspiring Minds

CHASE REPORT

NEWSLETTER OF THE DEPARTMENT OF MATHEMATICS AND STATISTICS

Faculty of Science

May 2010



**The Chase Building -- 80 years old
For 25 years the home of Mathematics & Statistics**

CONGRATULATIONS

AWARD WINNERS

Sir William Young Gold Medal in Mathematics
Daniel Hackmann

University Medal in Statistics
Jing Zhang

Ralph & Frances Lewis Jeffery Scholarship
Daniel Hackmann
Andrew MacDougall

Barry Ward Fawcett Memorial Prize
Jian Li

Ken Dunn Memorial Prize
Kira Scheibelhut

Katherine M. Buttenshaw Prize
Jessica Vandorpe

Waverly Prize
Saptarshi Chowdhury

Emil and Stella Blum Award in Mathematics
Matthew Dempsey

Ellen McCaughin McFarlane Prize
Jian Li

**Professor Michael Edelstein Memorial
Graduate Prize**
Emma Connon

PRESIDENT'S AWARDS

Chris Levy
Emma Connon
Rebecca Keeping
Matt Hurshman

NSERC AWARD WINNERS

PGS-D2
Danielle Cox
Matt Hurshman

CGS-D3
Mark Pavlovski

CGS-M
Daniel MacKeigan

USRA
Kira Scheibelhut (K. Taylor)
Matthew Stephen (A. Fraser)

NEW KILLAM*Emma Connon***KILLAM RENEWALS***Neil McKay**Andrew Hoefel**Mark Pavlovski**Caroline Cochran***HONOURS STUDENTS****Honours - Mathematics***Daniel Hackmann**Andrew MacDougall**Markus Karahka (1st subject Physics)***Honours - Statistics***Wei Dai (with Math)**Wei Chen**Li Li**Cuiwei Luo**Hongyue Wang**Wei Xie**Jing Zhang (with Economics)***GRADUATE STUDENTS****October 2009 Convocation:****Mathematics***Paul Ottaway (PhD)**Meghan Allen (PhD)***Statistics***He Gao (MSc)***May 2010 Convocation:****Mathematics***Ainsley Miller (MSc)**Chris Levy (MSc)***Statistics***Sylvia de la Ronde (MSc)*

CHAIR'S REPORT

by Karl Dilcher

The two main items I mentioned last year in this space were the new Student Resource Centre and the expanded Math Circles. Now, a year later, it is clear that both have made a big difference. The Resource Centre has become a very popular and very busy place, and the feedback from students has been overwhelmingly positive.

Meanwhile, the Math Circles project has been fully operational since this January, with Angela Siegel as project coordinator, working with Danielle Cox and Dorette Pronk. The team has already been on a few successful “road trips” in different regions of the province; further details can be found elsewhere in these pages.

This Fall will mark the Department's 25th anniversary in the Chase Building, and only this past Winter most hallways, classrooms and other rooms saw a new coat of paint for the first time. The Colloquium Room, Seminar Room and Conference Room now show some colour, but the 2nd floor lounge has been completely, and beautifully, redecorated, complete with new furniture. Gretchen looked after all the details of this major project.

As soon as the internal renovations were completed, work began on the long overdue continuation of the outside walls (repainting) that was begun 5 years ago at one part of the building. New windows will also be installed. This means serious disruptions due to noise during the summer months, and the department office had to move into the basement, the only relatively quiet part of the building.

Almost a year ago, in June of 2009, Ellen Lynch joined the department office as our new receptionist, replacing Jacky Grandy. Ellen has already become an indispensable member of the Chase family.

Another important event this past year was the Senate Unit Review which every department has to undergo once every 7 years. Last Fall Richard Nowakowski coordinated the collection of the necessary data with the help of our office staff and many department members, and wrote the required “Self Study Document”. The internal and external review

committees then visited our department in March and April, respectively. Their reports are expected in late May or early June of this year. This will be followed by a strategic planning exercise during the coming academic year.

On a more personal note, this past year I was able to enjoy a half-year sabbatical, and I would like to thank Richard Nowakowski for agreeing to be Acting Chair during that time. I also thank him and Gretchen for protecting me from what I call “scary chairy” matters while I was away. However, I'm glad that I didn't miss either last year's or this year's Awards Day ceremony, clearly the highlight of the academic year.

I hope you enjoy reading this edition of the Chase Report.

MATHEMATICS DIVISION

by Jason Brown

This year has been a quiet one in the division, up until recently when work started on the outside of the Chase Building!

We are in the first year of two major additions to the program offerings for mathematics in the undergraduate calendar. The first is a new double major program in science and mathematics, with mathematics as the second subject. This program provides science students outside of mathematics with a tailor-made program that emphasizes the applied side, and I have already had a number of students interested in this option. I expect the new program to draw more outside students into third and fourth year level undergraduate mathematics courses.

The other new program is a concurrent degree with Engineering Science with a concentration in mathematics. The engineering program is quite intense, with little room for other courses, but there have been engineering students wishing to add more math to their degrees. This new program is a welcome addition.

The Math Circles outreach program, sponsored by the Imperial Oil Foundation and Dalhousie University is into its first year. It is “spreading the word” across the province, and is doing an excellent job promoting

mathematics to a younger crowd. Many thanks for an outstanding job to Dorette Pronk, Angela Siegel, Danielle Cox and all those working on this important project.

Filling the teaching schedule is always a challenge, and this year was perhaps more difficult than most. I thank everyone for their assistance and flexibility; we truly are an exceptional department in the way we pull together.

Finally, we are in the midst of a unit review. Many thanks to Richard Nowakowski, Karl Dilcher and Gretchen for collecting the data and writing the report. Here's to better times ahead.

THE STATISTICS DIVISION

by Bruce Smith

Congratulations to Hong Gu and Toby Kenny on the birth of their daughter Lucy this past February. Hong has been on maternity leave since January, 2010. On her return, Hong will continue her duties as Director of the Statistics Division. She continues to work with Keith Taylor, Acting Associate Vice-President Academic Outreach and International Programs on efforts to bring Chinese students to Dalhousie to study Statistics in their third and fourth years. We are anticipating the first group of such students to arrive in the fall, 2010.

Joanna Flemming returned from maternity leave on April 1. She is working on a number of statistical problems with collaborators from the Ocean Tracking Network and the Biology Department.

Mike Dowd is on sabbatical from July 2009 through June 2010. Mike spent an exciting two weeks last July camping on the shores of Baffin Island, collecting data with Jon Grant (Dep't of Oceanography, Dalhousie).

John Robinson, University of Sydney, Australia, visited the department for three weeks in September 2009, to work with Chris Field on problems in robustness.

Ammar Sarhan, Mansoura University in Egypt, has been visiting since August 2008. Ammar taught several courses the past year, and is working with

David Hamilton and Bruce Smith on problems in reliability and lifetime data analysis.

Keith Thompson has been very busy with efforts to secure research chairs for the University. A Lloyd's Chair in "Modeling and Prediction of Marine Environmental Extremes" has been advertised, and will bring a joint appointment to the Division of Statistics and the Department of Oceanography. This is an exciting opportunity, with the successful candidate to lead a network of researchers from Canada, Australia, the UK and Brazil on estimation and forecasting of extreme marine events. Keith was also instrumental in Dalhousie's recent successful bid for a Canada Excellence Research Chair in Ocean Science and Technology, which will bring a number of new researchers into the Faculty of Science. These new positions hold promise for many collaborations among statisticians, oceanographers, and biologists. Congratulations, Keith.

Congratulations to the following undergraduates, who are graduating at the May 2010 convocation.

Wei Chen	-	B.Sc. Honours in Statistics
Wei Dai	-	B.Sc. Combined Honours in Mathematics and Statistics
Max Kehrl	-	B.Sc. Double Major in Mathematics and Statistics
Li Li	-	B.Sc. Honours in Statistics
Cuiwei Luo	-	B.Sc. Honours in Statistics
Jessica Vandorpe	-	B.Sc. Double Major in Mathematics and Statistics
Hongyue Wang	-	B.Sc. Honours in Statistics
Wei Xie	-	B.Sc. Honours in Statistics
Jiachi Zhu	-	B.Sc. Double Major in Statistics and Economics

AWARDS DAY SPEAKER

This year's Awards Day Speaker is **Dr. Aleksander Simonić**. Alex was born in Slovenia, where he received his B.Sc. and M.Sc. degrees at the University of Ljubljana. In 1990 he came to Dalhousie as a Ph.D. student, and was soon awarded a Killam Predoctoral Scholarship. Under the supervision of Prof. Heydar Radjavi he finished his thesis in 1994 and was awarded his Ph.D. in May of 1995. In the process he published several articles and gained some undergraduate

teaching experience.

Following this, in a career-changing move he tried to make a living as a self-employed software developer. Alex wrote, "After a few tough years (and serious doubts about the wisdom of the career change) I had modest success with the shareware application WinEdt. After that I was asked to collaborate on a wide range of software development projects, ranging from typesetting to image analysis".

However, among the many TeX users on Windows, and that includes many mathematicians everywhere, Alex is still best known for the WinEdt project which has gone through numerous revisions and has been kept alive to this day with many users around the globe. *-kd*

POSTDOCTORAL FELLOWS

Johan Brannlund received his Ph.D. at Stockholm University in 2003, after which he was a postdoctoral fellow at UBC. He came to Dalhousie in November, 2006, and has been working since then with Dr. Alan Coley. Johan has taught numerous courses for us, and on August 1st of this year he will take up a tenure-track position at Cape Breton University.

Mahya Ghandehari received her Bachelor's Degree in civil engineering in 2001 from Isfahan University of Technology in Iran. She obtained her Master's degree in mathematics at Sharif University of Technology. In 2005, she finished her second Master's degree at Concordia. She is currently finishing her Ph.D. at Waterloo under the supervision of Dr. Brian Forrest and Dr. Nico Spronk, and expects to defend her thesis this June. She will join our department as an AARMS PDF to work with Drs. Jeannette Janssen and Keith Taylor. Her research interests are in harmonic analysis, Fourier analysis, and combinatorial structures.

Toby Kenney received his Ph.D. at Cambridge University in 2006, and came to Dalhousie in September of that year as an AARMS postdoctoral fellow. His research interests are in category theory and topos theory, and he has been working with Drs. Bob Paré and Richard Wood. From August, 2008, until October, 2009, he had a research position at the Matej Bel University in Banská Bystrica, Slovakia. Since January of this year he has been again a postdoctoral

fellow in our department, this time working with Dorette Pronk.

Peter Lumsdaine will work with Peter Selinger as an AARMS PDF. His current research is in categorical logic, higher category theory, and constructive mathematics. He obtained his Bachelor's and CASM at the University of Cambridge, and expects to complete his PhD this year at Carnegie Mellon University, supervised by Steve Awodey.

Huaichun Wang received his Ph.D. in Biology at the University of Ottawa in 2005, and is a Postdoctoral Fellow funded by the Center for Comparative Genomics and Evolutionary Bioinformatics. His research interests include Molecular Evolution and Bioinformatics, and he has worked with Dr. Ed Susko and Dr. Andrew Roger of the Department of Biochemistry and Molecular Biology on statistical modeling of protein sequence evolution.

Michael A. Warren will be working as an AARMS PDF under the supervision of Dorette Pronk and Peter Selinger. He received his undergraduate degree from the University of St. Andrews (Scotland) in 2002 and obtained his Ph.D. in 2008 from Carnegie Mellon University. He is currently a postdoctoral fellow at the University of Ottawa, supported by the Fields Institute. His research is in category theory, mathematical logic and homotopy theory.

VISITORS

Again this past year several faculty members from other universities visited our department for shorter or longer periods of time.

- John Robinson of the University of Sydney visited Chris Field for three weeks in September, 2009.
- Carl Bender of Washington University in St. Louis visited Rob Milson in late October, 2009. He was also the Blundon Lecturer at the APICS meeting.
- Francis Clarke of University College, Swansea, visited Keith Johnson, November 10 - 17, 2009.
- Eberhard Kaniuth of the University of Paderborn visited Keith Taylor, February 10 - 24.

- Massimo Caboara from the University of Pisa visited Sara Faridi, February 18 - 28, 2010.
- Petar Pavešić of the University of Ljubljana in Slovenia visited Renzo Piccinini, April 15 - May 31, 2010.
- Dante Manna of Virginia Wesleyan College visited Karl Dilcher at various times during the past year, and will be spending most of the summer of 2010 at Dalhousie.
- Sigbjørn Hervik of the University of Stavanger in Norway has been visiting Alan Coley for the month of May, 2010.

We thank all visitors for contributing to the department's research efforts, for giving talks, and often taking part in the department's life. *-kd*

THE CHASE FAMILY

I am happy to report that department members (faculty and graduate students) continue to get married and multiply at an amazing rate. The previous three Chase reports listed a total of 8 weddings and 10 babies. Here are the family events of the last 12 months:

On June 6, 2009, **Vaneeta Grover** and her husband Himangshu were married in Edmonton, Alberta.

On July 4, 2009, **Caroline Cochran** (née Adlam) was married to Matt Cochran.

A baby boy, Andrew, was born to **Roman Smirnov** and his wife Ekaterina on July 17, 2009.

A baby girl, Claire Rolande, was born to **Rob Noble** and his wife Annie on August 19, 2009.

On August 25, 2009, **Neil McKay** and **Rebecca McKay** (née White) got married in Las Vegas, Nevada.

A baby girl, Lucy, was born to **Hong Gu** and **Toby Kenney** on February 15, 2010.

Congratulations and best wishes to all! *-kd*

RETIREMENT

After 33 years as a member of this department, Dr. George Gabor will leave us on early retirement, effective August 31, 2010. George was born in Budapest, Hungary, where he attended the L. Eötvös University of Sciences, graduating with an M.Sc. in 1971, and earning his Ph.D. in 1975.

From 1971 to 1976 he held an Assistant Professor position in the Department of Mathematics of the Technical University of Budapest. After moving to Canada, George first worked as a Research Assistant in the Department of Statistics of the University of Waterloo in 1976/77, before joining our department in 1977. He was promoted to Associate Professor in 1982 and to Professor in 1988. Since 2004 he has been on a reduced workload. George's main research interests have been Bayesian inference and the foundations of statistical inference.

Best wishes for a healthy and enjoyable retirement to George and his wife Julianna, who will also be retiring from her position as Senior Instructor in Chemistry. *-kd*

IN MEMORIAM

We join family and friends in mourning the loss of three valued members of our department community.

Dr. Erwin Klein passed away on March 14, 2009, in Buenos Aires, Argentina, where he was born in 1935. He first earned a law degree from the University of Buenos Aires, followed by a doctorate in economics from Kiel and Hamburg in Germany, before coming to Dalhousie in 1967. While a full-time faculty member in Economics, he obtained an M.Sc. in Mathematics in our department with Tony Thompson, and later chaired the Department of Economics between 1983 and 1994. He co-authored with Tony Thompson an influential book, *Theory of Correspondences*, the first volume in a then new CMS book series. After his retirement Erwin and his wife moved to Buenos Aires, where he continued to teach until almost the very end.

George MacLennan passed away at his home in Halifax on March 9, 2010; he was 59. Born in Halifax, George studied mathematics, physics, and computing

science at Dalhousie and Waterloo, receiving his B.Sc. and M.Sc., the latter under the supervision of Kevin Moriarty in this department. In 1976 George joined the University Computing and Information Services, now ITS, where he worked in various capacities in academic and administrative computing, systems, and database management. Among other relatives, George is survived by his wife Oriol of the Killam Library.

Maria Nair Piccinini passed away at home in Halifax on April 18, 2010. Born in São Paulo, Brazil, she is survived by her husband of 52 years, Renzo Piccinini, a member of our department. She is also survived by two daughters, three grandchildren and many other relatives around the globe. Like her husband, she was a mathematician and was fluent in several languages. Recently she translated a book by Renzo and his co-author Davide Ferrario, *Simplicial Structures in Topology*, from Italian to English. -kd

A DOUBLE ANNIVERSARY

As the caption on the front page indicates, this coming Fall and Winter mark a double anniversary for our department: The construction of the Provincial Archives Building (now the Chase Building) was completed 80 years ago, in 1930, and the formal opening took place on January 14, 1931. Secondly, the then Department of Mathematics, Statistics and Computing Science moved into the newly renovated (but not quite finished) building for the Fall term of 1985. The careful planning that preceded the move was chaired by Tony Thompson, in collaboration with the University Architect at the time, and with the help of many staff and faculty.

This double anniversary should be a reason for a celebration. Ideas are most welcome, as are volunteers to help organize some festivities – academic, social, or both. -kd

OUR DAYS ARE STILL NUMBERED

Last year I reported in these pages that **Jason Brown's** book, *Our Days Are Numbered – How Mathematics Orders Our Lives*, had just been launched in several cities, including a major book launch in our new Student Resource Centre. This year, Jason's book was

one of the three nominees for the “Evelyn Richardson Memorial Literary Prize for Non-fiction” at the 2010 Atlantic Book Awards. In conjunction with this nomination Jason gave a public reading and musical performance on April 12 at the “Company House”, a relatively new music venue on Gottingen Street here in Halifax. He was accompanied by Sageev Oore, the keyboardist from the band “Gypsophilia”. Sageev, by the way, is an honours mathematics graduate of this department, and is also a faculty member in the Department of Mathematics and Computer Science at SMU.

This April also saw the publication of the first of a regular sequence of Jason's monthly columns about mathematics in the Science pages of the Saturday *Chronicle Herald*. Past columns can be found in the department's web pages at <http://www.mathstat.dal.ca/community.html>

Finally, among other media and public appearances, Jason recently gave a public lecture in Ottawa. He is scheduled to give another one, again with musical accompaniment, at the beginning of the upcoming CMS Summer Meeting in Fredericton, on June 3rd. -kd

THE DEPARTMENTAL LIBRARY

While in last year's Chase Report I described the library's big move to its new home in the basement (in the Summer of 2008), there is not much to report this year. As most department members know, I keep a stock of old mathematics, statistics, and C.S. books, with the more elementary books stored in Room 107, and the more advanced ones in the library and in Room 305. All are for sale, with the proceeds going towards the purchase of new books. Many of the more advanced books are catalogued at <http://www.mathstat.dal.ca/~dilcher/oldbooks.html>

The large stock of the more elementary books in Room 107 was recently reduced when a student organization, called *Books With Wings*, selected and took out 30 boxes worth of books, for shipping to third world countries. I will gladly accept further donations of books (in the mathematical sciences).

Finally, I thank Danielle Cox for looking after the day-to-day operation of the library, Rob Milson as library

representative (now on sabbatical), and Swami who continues to send out the weekly “New Books” mailings, with those interesting biographical/historical sketches. -kd

JOHNSON’S LAW

Mathematics is full of rules and laws, such as Cramer's Rule, Pythagoras' Law, and many others. Perhaps a little less known is *Johnson's Law*, named after Professor Keith Johnson of this department who postulated more than 20 years ago that *there has to be snow on the day of the Calculus exam in April*. This can take the form of significant accumulation, or just a few flakes in the air, but year after year this law proved to be correct. Until finally this year, when we had an unusually mild early Spring and the law appeared to be broken at last. However, on the day of the big exam, Thursday, April 16, the temperature started to drop, and finally, when your law-abiding department chair went outside at around 11 p.m., there was indeed a wet snow shower. So, Johnson's Law remained valid for yet another year. -kd

A DEPARTMENT HIPPOPOTAMUS?

As was reported elsewhere, our department underwent a unit review this Winter and Spring. As part of this, two external reviewers visited the Chase Building for two full days, April 19 and 20. At the end of a long and exhausting first day camped out in Room 305, the eminent reviewers declared that one of their key recommendations would be the need for a Department Hippopotamus. They did not elaborate, but it is suspected that other universities have a well-established hippocracy, while we don't have one yet.

We now look forward to receiving the official written report with the reviewers' recommendations. -kd

THE BALCONY SCENE

As every department member knows, one of the nicest features of the Chase Building is our balcony. In fact, last year it served as the backdrop for wedding photos for at least two couples who had connections with our

department.

But now the balcony has also been discovered by the Dalhousie Theatre Department. On March 31st a group of three theatre students asked for permission to use our balcony as a stage for a class project. Obviously, permission was granted, and rehearsals began immediately. On that day and the next, April 1st, our balcony presented quite a spectacle, and occasionally it got rather loud.

And no, it was NOT Romeo and Juliet, nor was this an April Fool's joke, as at least one department member of little faith had conjectured. -kd

007: LICENCE TO DRILL

After the front part of the Chase Building had already been renovated in the Summer of 2005, the second part of the outside renovations began on April 12th. Scaffolding was erected on the South and South-West faces of the building, and a few days later the work of repointing the outside walls began in earnest, along with the deafening noise of powerful electric drills. So bad was the noise that it was decided to move the main office to Room 007 in the basement, the former computer lab that had just recently been converted to additional undergraduate study space.

The move was completed on Wednesday, April 21st, and the first official function carried out in the new office was a brief celebration of Balagopal Pillai's birthday, complete with a strawberry cake. -kd

NEWS OF RECENT GRADUATES

Victor Bomers (B.Sc. Combined Honours in Statistics and Contemporary Studies, May 2009) has received an NSERC award to attend graduate school this fall, and will be studying at the London School of Economics.

Farah Daya (B.Sc. Combined Honours in Statistics and Economics, May 2009) has recently taken a position with Flagstone Re in Halifax. She joins **Elizabeth Almeida** (B.Sc. Honours in Statistics and Mathematics, 2006, M.Sc. in Statistics, 2008) and **Georg Hofmann** (PDF in Mathematics, 2005-2008) as

department alumni at Flagstone Re working on a team modeling probabilities of catastrophic events.

Paul Sheridan (B.Sc. Honours in Mathematics, May, 2003, and M.Sc. in Statistics, May, 2007) is nearing completion of his Ph.D. in Statistics at the Tokyo Institute of Technology. Paul visited Dalhousie this past spring, and gave a stimulating seminar entitled “Scale-Free Structure Priors for Graphical Models with applications to Gene Networks”.

A baby girl, Ayla, was born to **Talia McCallum**, née Beech (M.Sc. Statistics, 2006), and her husband Kevin on October 2nd, 2009.

A baby girl, Rebecca Claire, was born to **Connie Stewart** (Ph.D. Statistics, 2005) on December 11, 2009.

Alice McLeod (BA Honours, Math. & English, 2000) will be co-chair of the Mathematics Department at John Abbott College, a CEGEP in Montreal.

A baby girl, Claire, was born to **Mike Bennett** (B.Sc. Honours, Mathematics, 1987) and his wife Wallapak in early August, 2009, in Thailand. Mike and family are now back in Vancouver where Mike is a full professor, and a well-known researcher in number theory. In the past, Mike served terms as Graduate Chairman and as Acting Department Head.

Adam Clay (B.Sc. Honours, Mathematics, 2003) recently defended his Ph.D. thesis, under the supervision of Dale Rolfsen at UBC, and will receive his degree on May 31st, 2010. He was recently awarded an NSERC PDF, which he will take up this Fall to work with Steven Boyer at UQAM. Adam's main area of research is low dimensional topology.

OTHER NEWS

Ph.D. candidate **Wade Blanchard** spent two weeks on Sable Island in early January, collecting data on gray seals.

Chris Field was riding on an elephant which attacked and toppled another elephant in India, in March. General mayhem ensued, but thankfully, Chris was unscathed.

Rob Milson was promoted to Full Professor, effective July 1, 2010.

After serving as Secretary of the Faculty of Science since his retirement as full-time faculty member 18 years ago, **S. Swaminathan** retired from this position in January, 2010. Later that term, his invaluable contributions to the Faculty were recognized during a luncheon given by the Dean. Swami continues to serve as one of Dalhousie's Chaplains, and as Technical Editor of the Canadian Mathematical Society.

GO WEST, YOUNG MAN

... and woman. **Tony Thompson** moved to Vancouver already in October, 2009, but returned for several visits since then. Now he and his wife Jia-Tsu have sold their home near the Dingle, and Jia-Tsu sold her well known Chinese store and tea house, the “Mu Lan Chinese Cultural Center” on Lower Water Street (<http://www.mulan.ca/>). From late June, Tony and Jia-Tsu will live permanently in Vancouver, close to one son and his family, and not too far from their other son with his family.

The Thompsons came to Dalhousie in 1966, and in these 43 years there has not been an area in the governance of the department or the university where Tony didn't have some positive, and often significant, influence. He was also a dedicated teacher and remains an active researcher, off to another conference while this report is being published. Jia-Tsu also made significant contributions to her field of research in Genetics, both as an innovative researcher and a textbook author. In recent decades she became better known for her community work in various different organizations, for which she received several local and national honours. We wish Jia-Tsu and Tony all the best for this new period in their lives, and we hope that they will come back for regular visits. -kd

RIEMANN IN SONG

The old adage that “There is a song for everything” was once again proven true, and that in an unusual setting. On May 7, Professor Peter Zvengrowski of the University of Calgary gave an excellent and well-attended Colloquium talk on “Riemann and his Zeta

Function". At the end he sang his own version, a capella, of Tom Apostol's song *Where are the zeros of zeta of s?*. While in recent years music has been an increasing part of other department events, this may have been a first in a colloquium. -kd

REUNION IN TOKYO

On November 24th one of our honours graduates, **Adam Clay**, gave a 90-minute talk in the Topology Seminar at the Graduate Centre of the prestigious University of Tokyo. One member of the sizeable audience of about 30 was Adam's Dalhousie classmate **Paul Sheridan** who has been in Tokyo for over 3 years, doing a Ph.D. in Statistics at the Tokyo Institute of Technology, also a very prestigious institution. And, to make sure that these two alumni don't misbehave, the Department Chair travelled specifically to Tokyo and also attended Adam's talk. (It must be pointed out, though, that the Chair resided only about 35 km away at that time, as part of his sabbatical). Meanwhile, Adam has just finished his Ph.D. at UBC, and Paul expects to be finished later this year. -kd

MATHEMATICS AND STATISTICS RESOURCE CENTRE

by Pierre Stevens

Old habits are hard to break. And I still refer regularly to our workspace as The Learning Centre. Maybe this report will make a clean break with that habit and from now on the centre will be referred to as the Resource Centre. Because with our (still) "new" space, room 119 has definitely become a hub for many new kinds of activities. Others will in this Chase Report no doubt talk about many of the "community at large" activities that take place in the Resource Centre. To me, it is just a pleasure to see the diversity of mathematical and statistical learning activities taking place in the Centre on a regular basis.

It would be very hard to establish verifiable, reproducible methods to measure the Centre's importance, but I believe that the Centre functions as a powerful emotive force on students' attitudes towards mathematics and statistics. It is a joy to see on many occasions the Centre buzzing like a beehive, packed with students actively engaged in their work, be it the

challenges of recreational math or coursework related challenges.

The department went out on a limb, in a way, when it decided to divert away from an institutional, utilitarian space and furnished the Resource Centre in 2008 with valuable art that reflects mathematical themes without being overtly pedagogical. Now, two years later, it is promising to see how well the physical space and its inventory have survived. Maybe two conclusions can be drawn: first what a wonderful group of undergraduate students we have had the pleasure to serve and secondly, that a study space can be much more than just four concrete walls. But again, kudos to our first and second year students for respecting their environment.

Which brings me to the next group of people whose valuable contributions must be put in the spotlight. Without them, and their dedication to providing valuable assistance in sometimes stressful circumstances, the Centre would be without a heart, without Resources: our student staff of Tutors and Teaching Assistants.

This year we have enjoyed the valuable services of, in no particular order: Chris Levy, Youssef Zaky, Donald Patterson, Daniel MacKeigan, Andrew Hoefel, Rebecca White, Neil McKay, Liwen Zou, Goldis Radjabalipour, Mark Pavlovski, Rob Noble, Joey Mingrone, Hongyue Wang, Hongqun Zhang, Melanie Abeysundara, Jinyi Liu, Karyn McLellan, Dave McNutt, Stuart Carson, Lihui Liu and Emma Connon.

To all of you, to say that you are the glue that holds the place together would be insulting. Not only are your services essential, but your positive attitude, your openness, your constructive approach, your enthusiasm, your share and care, it all contributed to a culture of learning; it all adds to this emotive force. Thanks again to all of you. And shame on me if I forgot someone.

Some of you will not be here next year. Others will continue and I will look forward to welcome you all back in the Fall to continue being an excellent resource for our first and second year undergraduate community.

May the Force be with you.

MATH CIRCLES

by Angela Siegel

Thanks to funding from the Imperial Oil Foundation, we have been able to enhance the Math Circles program and move beyond the borders of Halifax. This year, we began our journey of expanding the program to incorporate the rest of the province. We have started to venture out to further schools. We have been to Bridgewater, nine schools in Cape Breton (totaling 507 students in Cape Breton alone!), two first nations schools and plan to visit Digby before the school year is over. On top of this, we have continued to run monthly presentations here in Halifax. Attendance has been steady and we have had schools from further afield, such as the Windsor area, make an appearance at a few events.

The program has continued forward under **Richard Nowakowski, Dorette Pronk, and Angela Siegel**, the Program Director. New to our team, **Danielle Cox** has been a large help as the Coordinator for local events. Also assisting this year, as we develop presentation materials to be made available to schools, is a team of volunteers from the community that make up our Evaluation Team. The team consists of various high school teachers, B.Ed. students and instructors, past teachers and interested community members. We have had them together three times over the year to evaluate the materials that we are putting together as we move forward. They have helped us greatly in our goal to mold the program into one that is both exciting and user-friendly for the students and teachers that we will impact.

In other big news, Math Circles is hosting a new event for the department that we are calling the 1st Annual Math Fun Days, to be held at Dal over 3 days in June. The event has drawn 186 students from around the province. The event is free of charge and includes a tour of the campus and lunch for all involved. We are hoping that this will highlight the campus as well as all that we offer within our department. As a program, it will also serve as a means of advertisement for the types of activities and presentations that Math Circles can offer. Schools that will not be able to be accommodated within the event, which filled up amazingly fast, have been offered the chance for the same material to be presented by us at their venue.

DALHOUSIE GRADUATE MATHEMATICS AND STATISTICS SOCIETY

2009-2010 REPORT

by Danielle Cox

Since the end of the 2009 school year to the end of the 2010 school year, the Dalhousie Graduate Math and Stats Society has been busy! Below is a list of our activities.

May 2009: The society volunteered with Canada Post to run a water station at the Bluenose Marathon. Each station has a charity of choice, and ours was St. John's Ambulance. Our water station won the "Best Water Station" award, giving St. John's Ambulance a giant \$1000 cheque! May 2010 we will be helping to run the same water station and our President, Matt Hurshman will be running in the marathon!

July 2009: We had a Canada Day BBQ at the Chase Building.

September 2009: To start the new school year off we went on the Harbour Queen for what we thought would be a lovely, relaxing evening on the harbour. It was freezing cold and the music did not tickle our fancy that much, but the society had a lot of laughs and a fun time nonetheless!

October 2009: We had our Fall Semester Martini Party, where everyone dressed to the nines and had a lovely time. We also had a joint Halloween Party with DUMASS where Aliens, Hippies, Cpt. Kirk and Spock participated in a pumpkin carving contest. Of course there was a pumpkin carved with a Pi symbol. It wouldn't be a math and stats Halloween party without some pumpkin pi!

November 2009: Chris Levy spoke about intracellular signaling pathways at the Graduate Seminar.

December 2009: We had here in the department a successful holiday food drive which was donated to Feed Nova Scotia to help needy families over the holiday season. We also ran the Calculus and Statistics Exam Tutorials with DUMASS, which is the biggest fundraiser for the societies. The students also appreciate the extra help before their exams and we had a great turnout of students.

January 2010: Tim Caley spoke at the Graduate Seminar. The title of his talk was "A Computational Problem in Number Theory". We also rang in the new semester with a Games and Pizza Night at Chase.

February 2010: We had the Winter Semester Martini Party. We also sent a team of graduate students to the Nova Scotia Math League competition. We were tied for first going into the final round but came in 2nd in the end, perhaps this happened because we were given a set of trick questions!

March 2010: We celebrated Pi Day with some of Andrew Hoefel's home baked pies.

April 2010: We will run the Calculus and Statistics Exam Tutorials with DUMASS again this term.

GRADUATE REPORT – STATISTICS

by E. Susko

This year we welcomed six new MSc students into our graduate program: Weiguo Cai, Stuart Carson, Joey Mingrone, Ed Reddick, Hongqun Zhang and Jinyi Liu. A new PhD student, Paul Mattern, also joined us. Currently we have eight continuing MSc and six PhD students in statistics. We have admitted three new graduate students for 2010/2011. Two MSc students have completed programme requirements since the last Chase Report:

Sylvia de la Ronde	(R. Beiko and C. Field)
He Gao	(E. Susko)

GRADUATE REPORT – MATHEMATICS

by Sara Faridi

In 2009-10 we welcomed three new graduate students in our department: Rebecca Keeping from Memorial and Chris Levy from Dalhousie both joined our PhD program, while Dan Mackeigan from MSVU, Mark Pavlovski from Dalhousie and Douglas Staples from Dalhousie joined our Masters program.

The past year has been an active one for our graduate program. One of the greatest accomplishments of the graduate students was the 100% success rate in the

2010 NSERC Scholarship competitions. All applications submitted by our students to the university were forwarded to NSERC, and all of them were successful. Our success was certainly not part of a university-wide phenomenon.

We are looking forward to the arrival of many new students in September 2010, many of them from different parts of the world.

APICS CONFERENCE

Dalhousie hosted the 2009 APICS Mathematics, Statistics and Computer Science Conference, which took place October 23-25. While the Computer Science Building was the main venue for the conference, David Iron of this department was one of the main organizers, and he put a tremendous amount of work into making it a successful conference. The annual keynote lecture, the Blundon Lecture, was given by Carl Bender of Washington University who was also Rob Milson's research visitor during that time.

Finally, our student competition teams did an excellent job, with Victor Guo and Ethan Macaulay winning first prize, and Fred Sy and Wei Dai winning third prize. The teams were guided by Rob Milson, and S. Swaminathan had worked with the students since January, 2009, assigning weekly problems and discussing their solutions the following week.

Thanks to David, Swami, Rob, and the students for making this such a successful conference for our department. The next APICS Conference, in October 2010, will also be local, and will be hosted by Saint Mary's University. -kd

2009 PUTNAM COMPETITION

by Robert Milson

The results of the 2009 Putnam competition have arrived. Our Putnam teams did very well this year. There were 4036 contestants from 546 institutions; we placed in the top 100. Congratulations to Victor Guo, Wei Dai, Ethan MacAulay, Fred Sy, and Andrew MacDougall on a first rate effort and thanks to S. Swaminathan for his regular coaching.

NEW ZEALAND-THERE AND BACK AGAIN - WITH APOLOGIES TO TOLKIEN

by Richard Nowakowski

Sabbaticals are wonderful inventions, particularly when the place one visits is 12 hours out of phase with one's bosses. Such was the first quarter of my sabbatical. Dunedin, pop. 125,000, is the largest city in New Zealand that most people have never heard about. Look at the map of New Zealand, the small bump on the right hand side (not the big bump, that's Christchurch) just before you get to the bottom of the south island, that's the place. It has a lot in common with Halifax. Both are on the 45 parallel (give or take a few kilometres), long approaches to the harbours, hills!, a scottish background and a maritime climate. Halifax's ocean moderates the weather coming off the continent. In Dunedin, one range of hills is the only solid land between you and the Antarctic.

Our first week of January was spent huddled with blankets and wearing many layers of clothes to combat the highs of 11C, compliments of the aforementioned Antarctic. This was followed by 5 weeks of sunshine and with highs in the low 20Cs. Sunblock is a necessity as the ozone layer is thinner there than here.

The approaches to the harbor consist of the mainland and the Otago Peninsula which is about 10 kms long. So long that Albatrosses nest at the end—they only nest on islands* except here. Close to the Albatross colony, is the nesting area of Blue-eyed or Fairy penguins. They are tiny being only about 15 inches tall. You have to venture out to a small beach. First, avoid tripping over the seals, they literally litter the shoreline. They are hard to see, blending nicely into the rocks and may bite if you step on them, fortunately their fishy breath gives them away at 10 meters. Second, wait until the last vestiges of dusk and 'rafts' of 10-15 penguins come ashore. It may have been the power of suggestion, no lights of any kind are allowed, but I swear I saw two rafts. After recovering from their daily swim, their fishing grounds can be 30-50kms offshore, they make a break for the shelter of their burroughs in the grass. They totally ignore the people standing around and will go around your feet if you are in the way.

Further down the coast are the Yellow-eyed penguins, about twice the height of the Blue-eyed penguins.

They also keep better hours. Wandering on to the beach at 7pm and you'll see the penguins already ashore climbing up large sand dunes and even cliffs.

The Botanical Gardens are marvelous (New Zealanders do a good job on Gardens!). From our digs, it was 5 mins to the Department and 10 mins the opposite directions to the Gardens. Some days it was very difficult to make the right choice but the Scottish influence kept me straight. The rhododendrons are magnificent, but you have to be there in November.

If you get the chance, drive 1 hour north to Oamaru to see the Penny-Farthing races (seriously!) and, then, if you're brave enough, drive Dansy's Pass. 40kms of gravel washboard following an old gold mine trail. The hotel 5kms from the end has great beer and food, enjoyed in that order. (I don't have enough time or space to describe the Catlins about 4 hours drive south of Dunedin, but Tolkein would have approved of the area, definitely a place for the elves.)

Many people have heard of Christchurch, Kiakoura and Auckland. They are well described in the tourist literature, very unTolkienisk. Tauranga is the next biggest city that no-one has ever heard of. New Zealand has a large spike on the top right, Auckland sits at the bottom of it. The next spike, but much smaller is the Coromandel Peninsula then to the right is the Bay of Plenty which starts with Tauranga. Captain Cook named the area the Bay of Plenty because almost anything grows there. Almost all the kiwi in the country are grown here, plus many other fruit—eat your heart out Okanagan and Annapolis Valleys. Large avocados, 5 for \$1. Kiwis have to be picked by hand and there is a large 'grey' army. At harvest time, they pack up their small camper vans and trek from field to field. (Hot of the presses, look for grape-sized kiwis with edible skins to be in the stores in the next 5 years.)

The coast is one long (40km) beach with lagoons on the inside, the ocean is warm, and the climate is arguably the best in the country. The Coromandel Peninsula is only a few hours drive away. Another place Tolkien would have approved of. Fantastic scenery, but its touristic claim to fame is Hot Water Beach. A thermal spring wells up on a sand beach half way between high and low tide marks and creates an area 30ms wide of hot water. As the tide recedes, at the right time, maybe 100 people descend on the beach with buckets and

spades. (Just remember to return them to the appropriate kids when you're done.) The spade is to dig the hole, the bucket is to bring ocean water to cool the thermal water.

Unfortunately, Kiwis have discovered the area and house prices have skyrocketed in the last 5 years. Still the kiwi dollar is worth only 75cents Canadian and the cost of living is actually cheaper so? Australia will have to wait until the next Chase report while I dream.

PS: *Many things are reported by the Kiwis to be world famous, world's best or found only in New Zealand, e.g. L&P is world famous in New Zealand. I leave it to the reader to discover the validity of any claims.

PPS: The research was also great but the grad students will get to hear about that next year.

CHEBUCTO COMMUNITY NET by Andrew D. Wright

The Chebucto Community Net has been providing service to the community for sixteen years, and is the oldest Internet Service Provider in Atlantic Canada. A registered charity, Chebucto Community Net provides service to individuals, organizations and small businesses.

This past year we conducted a survey of our users. What we found out was pretty distressing.

When we were founded in 1994, the idea was to make sure that everyone had an equal access to the tools of communication. For a while, in the age of dial-up Internet access, we were able to achieve this. Halifax was ranked as the number two city in Canada for Internet access according to Statistics Canada, and all the other top cities had active community nets as well.

Since then we have entered the highspeed Internet access age. Public access to highspeed Internet depends on money, it depends on knowledge and it depends on location. What our survey showed us was that these are the three basic Digital Dividers, the things keeping people from equal access to the now much faster tools of communication.

We now know that if basic Internet access costs more than \$10 per month, there will be people who will have to drop it as too expensive. Seniors, people with chronic or terminal illness, lower income people all feel this pinch. In Halifax, one in four people have no home access to the Internet. One in five have no access at all.

Our survey told us that the majority of our users were senior citizens, and that there is a direct correspondence between age over 35 and a need for more training and information on how to use the computer and the Internet. A quarter of those at the low end of this age range up to one half of those aged 70 and above could use training. These are our users, the ones who've made it onto the Internet already. The figures for the general public would likely be worse.

The final Digital Divider - location - affects all of us. Halifax is located at an amazing digital crossroads, where net traffic from Europe makes landfall and where all North American traffic to Europe heads out across the Atlantic.

While one would think that such an opportunity would spur development of faster local network access to take maximum advantage of this, faster network speeds and lower network access prices remain as things only people living in other parts of the world may have.

Chebucto Community Net has started to take this message out to the people of Halifax with a series of Internet Town Hall meetings. Our first, at the Dalhousie SUB, drew more than a hundred people and was aired for a week on CBC Radio Noon. We are holding smaller regional meetings at library branches around the city to try and get the word out that people can join together to create faster, cheaper access that does not leave people behind.

All of us at Chebucto Community Net wish to thank the Department of Mathematics and Statistics for its support. A thousand of our neighbours thank you as well.

**CMS MATH CAMP
JULY 5-10, 2009**

by
Suraj Sikka and Roman Smirnov

The camp was held by the Department of Mathematics and Statistics, Dalhousie University, from July 5 – 10, 2009, under the auspices of Canadian Mathematical Society (CMS) and Dalhousie University. This was the tenth such camp and once again was possible by the financial support mainly from Dalhousie University and CMS. The organizers were Suraj Sikka and Roman Smirnov.

The goal of the camp was to identify, stimulate and encourage mathematical and statistical talent among the Nova Scotia high school students. This was made possible by lectures, problem solving sessions and computer activities, given by the dedicated faculty members from Dalhousie and St. Mary's Universities, graduate students from Dalhousie Math & Stats Department. The instructors were Keith Taylor, Karl Dilcher, Richard Nowakowski, Robert Milson, David Hamilton, Bruce Smith, S. Swaminathan, Angela Siegel (from Dalhousie University) and Robert Dawson, Stavros Konstantinidis from the St. Mary's University. We greatly appreciate their support and contribution. We are also pleased to thank Gretchen Smith, the departmental administrator, and the secretaries, Maria Fe Elder, Paula Flemming and Jacky Grandy for their unstinting help. Nobody, among the instructors, organizers or helpers, of whom there were many, received any payment for services rendered.

Twenty students, 11 boys and 9 girls, from high schools across Nova Scotia were invited to attend the camp. The students arrived, and registered on Sunday, July 5th between 1:30 to 2:30 pm. The organizers and the two chaperons, Matt Hurshman and Margaret-Ellen Messinger received them. Matt is a graduate student and Margaret-Ellen just finished her Ph.D from our department, many thanks to both of them for a job well done. The students and the chaperons all stayed at Rislely Hall, a student residence. Following the registration, a reception was held for the students and the parents. Karl Dilcher, the chair, and Richard Nowakowski, the acting chair of the department along with a number of other faculty members were present. The students and their parents had a chance to talk to

them and were very impressed. We would like to thank them for their participation.

Each day of the camp was divided into a morning session (9:00 to 12:00 with a 15 minute snack break) and an afternoon session (1:30 to 3:30). Every day, after the academic sessions were over, the students spent about an hour and a half playing sports or working out at the Dalplex, the university's athletics and sports complex. Computers were an integral part of the camp. Robert Dawson, taught the students how to print on their T-shirts some of the work they had done in class. For this purpose, each of the students was provided a T-shirt. They thoroughly enjoyed this activity, and the individualized T-shirts looked great. I would also like to thank the chaperons, especially, Matt Hurshman, for their help in printing the T-shirts

There were several extra-curricular activities—bowling, chess and board games, pizza party etc. This year, the N.S. International Tattoo, a very popular annual event in Halifax, took place in the same week as the camp. The chaperons took the students to this show and all of them enjoyed it very much.

We would like to thank Ron Fitzgerald of Math Resources Inc. for donating the package of their Math dictionary. The students were pleased to get them.

I am grateful to Karl Dilcher for taking care of the closing ceremonies. A T-shirt provided by the CMS and a number of awards and Pizza was provided to the students. The students were asked to fill evaluation forms at the end of the camp and it is evident that the students thoroughly enjoyed the variety of events and showed that the camp was a great success.

MATH CAMP FOR BLACK STUDENTS
by R.P. Gupta

The seventeenth mathematics camp for black students was held the second week of July 2009. The camp was organized by the Department of Mathematics and Statistics and the Black Educators Association of Nova Scotia. Thirty-two students were selected to attend the camp from schools all over Nova Scotia.

The aim of the camp is to generate interest in mathematics, statistics, & computer science so these

students can pursue further studies in these subjects.

The students are generally of grade six and seven and are brought to the Dalhousie campus. While here they stay in Howe Hall.

Mornings and early afternoons are devoted to lectures in mathematical, statistical and computer activities, while late afternoon and evenings are devoted to extra curricular activities where they can apply the talents they have learned in the classes.

They are taken to Dalplex for one hour each afternoon where they participate in swimming and play other games such as basketball, tennis, etc.

They also visited the Nova Scotia museum of history and science and the Discovery Centre. Students of the Camp also spent an evening at the Black Cultural Centre in Dartmouth where they were told about the mathematicians and scientists of black origin and also saw a film.

The students were taught and cared for by seven instructors (three university professors and four school teachers) and four chaperons. The Camp was organized under the directorship of Professor R.P.Gupta of Dalhousie University and Mr.Gerry Clarke of the Black Educators Association. It was financially supported by NSERC Promo Science Grant, Dalhousie University and the BEA.

AARMS

by David Langstroth

AARMS has had a busy year. After a disappointing result from its proposal to the NSERC MRS program, AARMS continued its discussion with its stakeholders and succeeded in putting in place significant new funding streams from the provinces of Nova Scotia and New Brunswick, who will each contribute \$250,000 over the next five years. This achievement owes much to the continuing commitment of the three Mathematics Institutes in Canada we are hopeful of obtaining a similar agreement with the province of Newfoundland and Labrador.

These new funds will enable AARMS to support more research activities in the region, and to expand our

programs. In March this year we were able to offer 5 new postdoctoral fellowships (three at Dalhousie, and two at Memorial). This represents a significant advance from our previous pattern of one or two fellowships each year.

Another successful summer school for graduate students took place in Fredericton in July 2009. Our ninth annual summer school in 2010 will also be held in Fredericton (see www.aarms.math.ca/summer), after which we plan to move the school to a new location in 2011.

AARMS continued to support more than a dozen conferences, workshops and related activities throughout the Atlantic Region, as well as the Atlantic Algebra Centre, based at Memorial under the direction of Yuri Bahturin. Our Distinguished Lecturer series brought Dr. Hans-Jürgen Schneider from the University of Stuttgart for a series of talks in the region on Hopf Algebras and Nichols Algebras.

AARMS has three calls for proposals per year (May 15, Sept 15 and Jan 15) but we are always happy to hear from people with inquiries or good ideas at any point in between. www.aarms.math.ca

MATHEMATICS COLLOQUIUM IN 2009/2010

by Peter Selinger

Once again, the Mathematics Colloquium has been a great opportunity to learn about the work of colleagues in all areas of mathematics, whether visiting from other universities, or from within our own department. I would like to thank Andrea Fraser, who has done a great job as colloquium chair while I was on parental leave in the Fall. I would also like to thank all the speakers, as well as their respective local hosts, without whom it would be impossible to organize a colloquium series. This year's talks were:

July 20, 2009: Toby Kenney (Univerzita Mateja Bela)
Graphical composition of equivalence relations, and its relevance to congruence lattices

July 30, 2009: Karen Yeats (SFU)
Periods of Feynman graphs

August 31, 2009: Jeffrey Morton (UWO)
Groupoidification and 2-Linearization

September 28, 2009: Xiaofeng Ren (George Washington University)
The many solutions of morphology and morphogenesis problems

October 22, 2009: Jeff Blanchard (Grinnell College)
Compressed Sensing: a contemporary story of the application of mathematics

November 16, 2009: Francis Clarke (Heilbronn Institute and Swansea)
Enumerating Abelian Groups

March 4, 2010: Der-Chen Chang (Georgetown University)
"On the d -bar-Neumann problem

March 29, 2010: Karl H. Hofmann (TU Darmstadt)
The probability that two elements commute in a compact group

March 30, 2010: Aaron Clauset (Santa Fe institute)
The trouble with community detection in complex networks
(joint MoMiNIS-MITACS seminar and special Mathematics Colloquium)

April 5, 2010: S. Swaminathan (Dalhousie)
Dirac's Scissors and Strings Problem

April 19, 2010: Petar Pavešić (U. Ljubljana)
Automatically trivial fibrations

May 7, 2010: Peter Zvengrowski (Calgary)
Riemann and his Zeta Function

SEMINARS

In addition to the Mathematics Colloquium mentioned above, our department has a very active seminar culture, with numerous seminars in both divisions, some more regular than others.

The most regular and most well-attended seminars are

- The Statistics Colloquium, organized by Hong Gu in

the Fall, and in a collective effort in the Winter term.

- The Atlantic Category Theory & Algebra Seminar (ATCAT), organized by Bob Paré, probably the longest running continuous seminar.

Other Seminars (and their organizers) are

- Analysis Seminar (Andrea Fraser);

- Graduate Student Seminar (Andrew Hoefel);

- Graph Theory Seminar (Richard Nowakowski);

- Honours Seminar (Rob Milson);

- Number Theory Seminar (Rob Noble).

For more details, including speakers and titles, see <http://www.mathstat.dal.ca/seminars.html>. I thank all organizers and speakers for contributing to a lively research atmosphere through these seminars. -kd

BRAIN TEASERS

Edited by
S. Swaminathan

Brain Teasers (Chase Report - 2010)

I. Seated in the department lounge are Robinson, Jones and Smith, who are (NOT respectively) the Chairman, a Professor and an Instructor. There are three graduate students also in the lounge who happen to have the same names: let us call them Mr. Robinson, Mr. Jones and Mr. Smith. The following statements hold good:

- (a) Mr. Robinson lives in Truro.
- (b) The Instructor lives exactly half-way between Truro and Halifax.
- (c) The stipend of Mr. Jones is \$20,000/year.
- (d) One of the six persons, who is the Instructor's nearest neighbor, earns exactly three times as much as the Instructor.
- (e) Smith beats the Chairman in chess.
- (f) The grad student whose name is the same as that of the Instructor lives in Halifax.

Question: Who is the Professor?

Answer: The Instructor, who lives between Truro and Halifax, also lives near Mr... who earns thrice the Instructor's earnings. This Mr... can't be Mr. Robinson and he can't be Mr. Jones since 20,000 is not divisible by three. Therefore the Instructor's neighbor must be Mr. Smith. The grad student whose name is the same as that of the Instructor lives in Halifax. He can't be Mr. Robinson because of (a). He can't be Mr. Smith either since the latter is a neighbor of the Instructor who lives between Halifax and Truro. Therefore he must be Mr. Jones. Hence the Instructor's name is also Jones. Finally, from (e) we infer that the

Chairman must be Robinson. Therefore the Professor's name is Smith.

II. Pick two Canadians at random – Ms. A and Mr. B. Suppose the chances are about 1 to 200,000 they'll know each other. How likely is it that A will know someone who knows someone who knows B?

Answer: There is better than even chance of such a connection. ("It is a small world!")
The average person is in direct touch with 500 people – each of whom is a link in many different chains of acquaintance spreading in all directions.

III. If a couple plan to have four children, which one is more probable: (a) two boys and two girls, or (b) three of one sex and one of the other?

Answer: Most people would guess (a). But the answer is (b). Listing all possible combinations – there are 16 of them – we find in 6 of them a two-two split, and in 8 a three-one split. So the probability is 8/16 or ½ that the sexes will split as in (b).

IV. Ron's telephone has a push-button dialing system in which the digits are displayed in a 3 x 3 matrix form. While using these buttons to call his friend, Shirley, he noticed that her six-digit phone number has some interesting properties. It was an odd perfect square in different digits, and no two digits adjacent in her phone number were adjacent (horizontally, vertically or diagonally) on the telephone. What is Shirley's phone number?

Answer: 349281 = (591)².

CHASE REPORT

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

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for future issues.

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