# LOCAL SPACES

*UBC Department of Mathematics*                                        *Winter 2007*

## *Message from the Head*

I would like to welcome you back to the start of the new term.  I hope that you had an enjoyable and restful winter vacation.  I did, and I certainly needed it because this past term was, by far, the busiest term I have experienced as Head.

Our main focus was the development of a new Academic Plan and an External Review of our department.  The university requires that departments and other academic units undergo periodic External Reviews.  Our department was last reviewed in 2001.  Since then we have changed dramatically, with the addition of many new faculty (half of our faculty have arrived within the past five years!) and major expansion of our graduate and postdoctoral fellow programs (50% and 100% respectively).  And so the time was ripe, this past fall, for another External Review.

The External Review Committee, a group of five very distinguished mathematicians from the US and Canada, was selected by the Dean's office, partly based on input from the department. The committee visited on December 13th and 14th and will submit a report to our Dean very soon.

In preparation for the review, over the summer and fall, our faculty and staff were busy putting together information on our department (mainly lots of statistics) and gathering comparative information from selected Math departments in Canada and the US.  Also, our faculty was divided into committees, each charged with the job of reviewing an aspect of our program.  These committees wrote reports that were discussed by faculty at department meetings and at a retreat near the end of September.  This was a great opportunity for self-examination of our programs, planning for the future and making a case for our needs. The process culminated in a new Academic Plan that will soon be posted on our website.

The External Review was not the only reason for the unusually high level of activity this past fall.  As a result of our recent growth, we had record numbers of NSERC grant applications and cases for promotion.  And many of our faculty were involved in preparing the PIMS renewal application.  The activity will continue throughout January with a very large number of job interviews and preparations for the PIMS site visit on January 22nd.

So, with all of this work, am I complaining?  Well, maybe a little bit, but not really: because I view the heavy workload as a direct result of our many successes in bringing so many wonderful faculty, postdocs and graduate students to UBC.   And I look forward to many continued successes in the future.


Best wishes,

*Brian Marcus*

# Graduate Seminars
*by Warren Code*

After a successful series last year under the direction of Mariah Hamel, the Graduate Student Seminar has returned for 2006-2007, which I now coordinate. The seminar aims to bring graduate students (and others; anybody interested is welcome to attend) together to hear about topics from other disciplines, gives the speakers a chance to practice talks related to their research, and provides everyone with the opportunity to enjoy some snacks.

This first semester featured four engrossing talks touching a broad range of mathematics including classic analysis and algebra, dynamical systems, number theory and graph theory. All of the talks were introductory in nature, making them accessible to students from a variety of backgrounds.

Patrick Walls started things off in September with "An Introduction to p-adic Fields and Adeles", which introduced the audience to these objects that result from strange metrics that beget strange but ultimately useful properties. Tying together concepts from number theory, analysis, algebra, and topology, this talk had a little bit of something for everybody.

I presented the second seminar with an introduction to control theory: what happens when a dynamical system can be affected in a restricted manner to influence its behaviour. The self-parking car was presented as one of many examples of control systems in action.

Ignacio Rozada followed with another more applied talk, "Networks in large-scale epidemic simulations", with a number of real-world examples of large-scale networks accompanied by eye-catching slides. He described the current approaches to dealing with massive networks (the internet, for example) as well as new methods he has been working on in terms of extracting information from these computationally challenging systems.
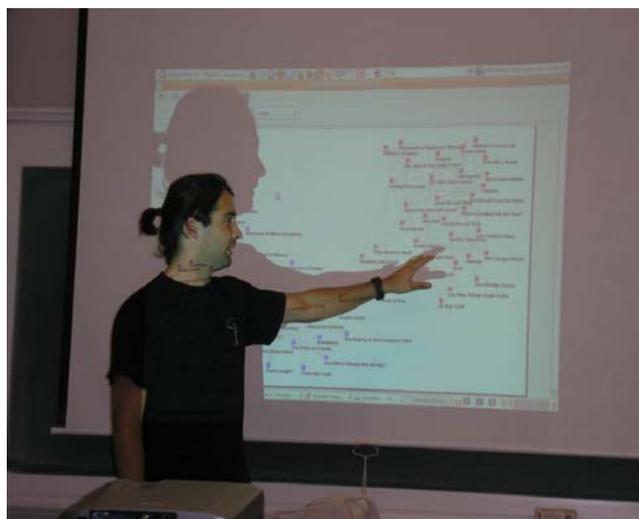


The last talk of the term switched from real-life large-scale problems to the more abstract magnitudes of ordinal numbers; Alex Duncan's "The Surreal Numbers" introduced the audience to J. H. Conway's mathematics involving ordinal numbers. Again, some simple assumptions put together in clever ways produced bizarre and fascinating structure.

All are welcome when the Graduate Student Seminar continues in January with McLean Edwards' talk: "Sum-preserving rearrangements of series", time TBA. For scheduling information, check out the following website http://www.math.ubc.ca/~warcode/grad_seminar/index.html.



Photos by Amy Goldlist

# Highlights of 2006





Dale Rolfsen – one big knot at the Halloween Party! (The Ha photo)

Department Retreat held in Whistler on September 30-October 1, 2006. (The Ha photo)





Faculty and students gathered at the Annual IAM BBQ/Potluck held at Spanish Banks in September. (Marek Labecki photo)

Mar Ness takes the Polar Bear plunge at Jericho Beach on New Year's Day. (Judith Parker photo)

# ACADEMIC AWARDS AND HONORS

Martin Barlow was featured at the 2006 UBC Celebrate Research Gala for his election as Fellow of the Royal Society of London.

Joel Feldman was awarded the CRM-Fields-PIMS prize for 2007. This prize is awarded jointly by the Centre de Recherches Mathématiques (CRM) of l'Université de Montré'al, the Fields Institute, and the Pacific Institute for the Mathematical Sciences.

Nassif Ghoussoub won the 2007 Jeffery-Williams Prize given by the Canadian Mathematical Society, given annually to a mathematician who has made outstanding contributions to research.

Alexander Holroyd was awarded the 2007 André-Aisenstadt Prize. This award is given by the Centre de Recherches Mathématiques (CRM) of l'Université de Montréal to young talented Canadian researchers.

Emeritus Professor Robert Miura won the 2006 Leroy P. Steele Prize with C.S. Gardner, J.M. Greene, and M.D. Kruskal for the seminal paper Korteweg-de Vries equation and generalization. VI. Methods for exact solution. Comm. Pure Appl. Math. 27(1974), 97--133. The Steele Prize is a prestigious award given by the American Mathematical Society.

## Announcements

### Retirement News

David Boyd, Bill Casselman and Denis Sjerve retired in December 2006. We thank David, Bill and Denis for their many contributions to excellence in research and teaching.

David joined the Math Department in 1971 and served as Head in 1986-1989 and most recently as Associate Head in 2003-2005. Over the years, David served on numerous committees, including dca, President's Committee for Selection of Heads, and the PIMS Scientific Review Panel.

Bill started in 1971 and since then has been involved with various departmental committees including dca, Library and Computer committees. Bill continues as Graphics Editor of *AMS Notices*.

Denis joined the Math Department in 1968. He was Graduate Advisor for eight years. Denis also served on Senate, the Faculty of Science Curriculum

Jozsef Solymosi won a 2006 Sloan Research Fellowship which is awarded annually to approximately 20 outstanding young mathematicians who have received their doctorate degree, from a college or university in the US or Canada, at most 6 years ago.

Nike Vatsal won the 2006 Ribenhoim Prize awarded by the Canadian Number Theory Association. This prize is awarded every 4 years to a young number theorist (as defined as having received their doctorate less than 12 years ago) who is Canadian or has connections with Canadian mathematics. Nike also gave an invited lecture at the 2006 International Congress of Mathematics in Madrid.

Miguel Angel Moyers-Gonzalez was awarded the Canadian Applied and Industrial Mathematics Society (CAIMS) Cecil Graham Doctoral Dissertation Award for 2006 for his doctoral thesis: *Transient Effects in Oilfield Cementing Flows.* The recipient of the award receives a trophy, a monetary prize and a one-year membership in the Society, as well as being invited to present their thesis at the Annual Meeting of the CAIMS.

Committee, and chaired the Scholarship Committee for the Faculty of Graduate Studies.

### New Faculty

The department is pleased to announce the addition of seven new faculty members: Assistant Professors Julia Gordon, Antoine Mellet, Malabika Pramanik, Andrew Rechnitzer, Professor Jeffrey Smith, Honorary Professor Luzius Grunenfelder, and Instructor Mark Maclean. We wish you all success in your new positions at UBC.

### Staff News

Viena Tran accepted a position in the Department of Statistics as Graduate Secretary effective January 1st. Over the past three years she served on the Facilities Committee, acted as coordinator for many of our social events, and provided valuable advice on many matters. We will miss Viena, and we wish her all the best in her new job.

## Educational Outreach Initiatives

by Melania Alvarez, PIMS Education Coordinator

Starting in 1991, the Department of Mathematics decided to get more directly involved with educational outreach in schools. One of the means chosen was to sponsor problem-solving workshops aimed at Grade 11/12 students (called Euclid workshops) in high schools around the province. Given their success and the interest, within a few years, these workshops extended to students in Grades 8 to 10. Faculty assisted by graduate and undergraduate students lead the Grade 11 and 12 workshops; faculty, graduate or undergraduate students, who are assisted by undergraduates, lead the Grade 5 to 10 workshops.

Since the fall of 2005 the Pacific Institute for the Mathematical Sciences (PIMS) has joined forces with the UBC Mathematics Department in sponsoring these workshops. Together with my assistant Jordan Forseth, a fourth year undergraduate student hired by the Mathematics Department, we have held over 35 workshops this Fall (2006), and the aim is to hold in total almost 100 workshops by the end of this term. Many graduate and undergraduate students and faculty have helped in this endeavor, but we want to specially recognize people who have regularly helped us so far this year: Jennifer Cho, Henry Wong, Ryan Lukeman, Christine Yang, Ali Nabi Duman, John Lang, Justin Pringle, Ivy Hui Wan Lo, Victoria Alfred and Professor Dale Rolfsen. Thanks to you all!

Last term we visited schools in Tsawwassen, Richmond, Surrey, New Westminster, Delta, and Vancouver, and this term we are looking forward to visiting schools all around the province, including Squamish, Hope, Coquitlam and Kitimat.

At each workshop, a set of problems of varying difficulty is given to the students. While students work on the problems the workshop leader and accompanying assistants walk around the class observing work habits, giving pointers or encouragement to individual students and deciding at what level to pitch the presentation of solutions. Students are encouraged to work in groups. Each workshop runs for a minimum of 1.5 to 2 hours and

involves 20 to 30 students. We aim to excite students about mathematics by exposing them to interesting math problems. Another positive development is that many of our volunteers become interested in teaching and a number of them have become high school and elementary school teachers afterwards.

Outreach is a rewarding experience. In addition to the math workshops many staff and faculty from the Mathematics Department participated at the Math Mania event which was organized by PIMS at Queen Elizabeth Elementary and a Math Mania event which is co-jointly organized during the ELMACON (Elementary Math Contest) competition. Math Mania consists of "fun" methods to teach math and computer science concepts to children (and adults!) by games and art. This includes lots of hands-on activities like Exciting Geometrical Models from Straws and Paper, Mathematical Puzzles, The Guessing Game, A Sorting Network, The Penny Game, The Set Game, Bubbles, and more!





Photos provided by Melania Alvarez