



PIMS MAGAZINE

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DIRECTOR'S BLOG

It's a great pleasure for me to write these lines about PIMS and its accomplishments in 2009. Thanks to the efforts of many mathematical scientists, educators, students and staff members we have had a record level of activity at the PIMS sites. Notable events included our summer thematic program in Partial Differential Equations, which featured nine consecutive week-long workshops as well as a vibrant summer school, and the highly successful joint CRM-PIMS thematic program on Challenges and Perspectives in Probability. Likewise our new PIMS Collaborative Research Group on Operator Algebras and Non-commutative Geometry organized splendid scientific events at Regina and Victoria. Meanwhile the PIMS International Graduate Training Centre in Mathematical Biology has continued its successful recruitment of students as well as a steady stream of excellent training activities, including a summer school at the Bamfield Marine Sciences Centre.



As you will read in this magazine, PIMS has also been quite active in education and outreach, touching the lives of many students, teachers and parents. We have a dedicated staff of outreach specialists through the PIMS universities, and our expanding programs are spearheaded by their tireless activities. I would also like to acknowledge the important funding from private donors which we have received for these programs.

Our international activities continue in full swing, we are currently hosting several French researchers who are visiting PIMS, which is an Unité Mixte Internationale of the CNRS. We have also recently signed a collaborative agreement with the Mathematical Sciences Institute at the Australian National University. Last August PIMS-UBC hosted the second joint meeting of the Canadian and Mexican mathematical societies. It was an occasion which combined exciting mathematics with warm camaraderie between members of the two communities. Hats off to the CMS staff for their wonderful organizational talents!

The new PIMS Deputy Director (George Homsy) will be stepping in on January 1, we are all looking forward to having him join our team. I would like to take this opportunity to thank David Brydges, who has done a remarkable job as PIMS Deputy Director for the last year and a half.

Last but not least, November 15-21, 2009 was declared Mathematical Sciences Awareness Week by the Government of British Columbia, and I am pleased to report that PIMS and our partner organization MITACS were prominently mentioned in their official declaration. This is a recognition of many years of sustained effort by numerous colleagues to promote the cause of mathematics in Western Canada, indeed around the world, and a great motivation to reach for even greater achievements.

Warmest regards,
Alejandro Adem
Director, PIMS

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PIMS AND MSI SIGN COLLABORATIVE AGREEMENT



THE AUSTRALIAN NATIONAL UNIVERSITY

The Pacific Institute for the Mathematical Sciences is pleased to announce that it has signed a collaborative agreement with the Mathematical Sciences Institute (MSI) at the Australian National University in Canberra, Australia.

The Australian National University (ANU) is primarily a research institution with a small but strong education component. The Mathematical Sciences Institute (MSI) is the main venue in the ANU for research in mathematics; its research programs are organised by the Centre for Mathematics and its Applications.

The Director of the MSI is Professor Alan Carey assisted by the Associate Directors of Education (Assoc. Professor John Urbas) and of Research (Professor Alan Welsh). The MSI arranges regular symposia, seminars and conferences. International linkages are a priority and are supported by the Mathematical Sciences Research Visitor Program.

Professor Carey was an organizer of the PIMS workshop on KMS States and Non-Commutative Geometry held at the University of Victoria in July 2009, and he has strong connections to the PIMS community. Cooperation between MSI and PIMS will take place through exchanges of scholars and students as well as by the organization of further joint events. The agreement with MSI extends the network of mathematical institutes in the Pacific Rim which actively collaborate with PIMS, and colleagues at both institutions are looking forward to a very productive relationship.

GEORGE HOMSY NAMED AS INCOMING DEPUTY DIRECTOR

The Pacific Institute for the Mathematical Sciences is pleased to announce that on June 19, 2009 its Board of Directors approved the appointment of George M. Homsy as Deputy Director of PIMS for a five-year period, starting on January 1, 2010. Professor Homsy will also assume a faculty position at the University of British Columbia.

George Homsy is currently a faculty member at the University of California at Santa Barbara. His field of research is fluid mechanics and hydrodynamic stability and he has published over 150 papers in the leading journals of the field. Professor Homsy has held many positions, including Vice-Chair and Chair of the APS Division of Fluid Dynamics, two terms as Department Chair at Stanford, Chairman of the Board of USRA, one term as Department Chair at UCSB, and the Associate Editorships of both SIAM J. Applied Math and Physics of Fluids. He is a Fellow of the APS, a Bing Fellow at Stanford University, and has been the Midwest Mechanics Speaker, the Talbot Lecturer at UIUC, and the Bachelor Visitor at DAMTP, Cambridge in addition to many visiting professorships in the US and Europe. He was the Principal Investigator for the production of "Multimedia Fluid Mechanics" (Cambridge 2001), and its second edition (2008). He is the recipient of the APS Fluid Dynamics Prize for 2004 and was elected to the US National Academy of Engineering in 2006.

Alejandro Adem, the Director of PIMS remarked that "The appointment of George Homsy as Deputy Director adds enormous academic strength and administrative experience to the PIMS team. I am delighted that we were able to recruit him, as his expertise in applied mathematics is outstanding, while his experience as an academic administrator is exceptional. I also want to thank the current Deputy Director, David Brydges, for so effectively filling this position on an interim basis."



*Incoming Deputy Director
George M. Homsy*

CHARLES DORAN NAMED NEW PIMS UofA SITE DIRECTOR

Charles Doran is the new PIMS site director for the University of Alberta, replacing Gerald Cliff who served in this capacity for the past five years.

Professor Doran began his career with a Ph.D. from Harvard University in 1999, followed by postdoctoral fellowships at Penn State and Columbia University. In 2008 he moved from a faculty post at the University of Washington to the University of Alberta, where he is now an associate professor in the department of Mathematical and Statistical Sciences.



Charles Doran, the newly appointed PIMS University of Alberta Site Director

Professor Doran has established himself as one of a select group of top experts on the mathematics and physics of Calabi-Yau spaces. Most recently, his work has focused on the interplay between algebraic cycles and string dualities.

NEW BOARD AND SRP MEMBERS NAMED

The PIMS Board of Directors is responsible for the oversight of all aspects of PIMS. Five new members of the Board began their term July 1, 2009, while three board members stepped down from their positions. PIMS would like to thank Richard Keeler for 2 years of service, Mark Lewis for 5 years of service, and Hugh Morris, for a colossal 12 years of direction over PIMS. Beginning their tenure on the Board are M. James Hendry, Engin Özberk, Nils Petersen, Andrew S. Wright, and Afzal Suleman.

The scientific activities of PIMS are reviewed by an arm's-length Scientific Review Panel (SRP) of experts from various fields of the mathematical sciences. The SRP also saw a changing of the guard. Departing the SRP, also on the 1st of July, were John Friedlander, Randy Goebel, Bruce Reed, Nancy Reid, Bob Russell and Efim Zelmanov. The incoming SRP members, with renewable 2 year terms are Vladimir Chernousov, Peter Guttorp, Pavol Hell, Stephen Kudla, Michael Mackey and Linda Petzold.

For more information, see: <http://pims.math.ca>

PI IN THE SKY EDITOR PASSES TORCH

Anthony Quas has been named as the new editor for Pi in the Sky, and his inaugural issue is due for publication in the spring/summer of 2010. Quas is a Canada Research Chair at the University of Victoria in the Department of Mathematics.

Retiring from the position is David Leeming, also of the University of Victoria. David published 6 issues over 6 years. His devotion to mathematics and education made for wildly successful publications, distributed globally and archived in civic and educational libraries around the world.

Pi in the Sky magazine is primarily aimed at high school students and teachers, with the main goal of providing a cultural context/landscape for mathematics. It has a natural extension to junior high school students and undergraduates, and articles may also put curriculum topics in a different perspective. Pi in the Sky accepts materials on any subject related to mathematics or its applications, including articles, problems, cartoons, statements, jokes, etc.



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PIMS EDUCATIONAL OUTREACH ACTIVITIES

PIMS has a long tradition of outreach to schools in British Columbia, especially in the areas of teacher education as well as in alternative student education. Activities this summer included the **2009 PIMS Math Summer Camp**, aimed at preparing aboriginal students for the mainstream secondary school curriculum in mathematics, and teacher workshops in Vancouver, Kuper Island, Vernon and Port Alberni. PIMS is also offering a series of workshops at UBC closely modeled on the highly successful Lesson Studies conducted by the Galileo Educational Network of Calgary.

PIMS UBC Aboriginal Education Coordinator Rahael Jalan spent September and October running the Education without Borders (EWB) project **Math Yes We Can!** at Fezeeka Secondary School in Cape Town, South Africa. The students were eager learners and teachers and administrators were enthusiastic supporters of the project. The school hopes to continue the program in 2010.

The PIMS Uvic **Math Mania** team of volunteers visited Elizabeth Buckley School (EBS) in Victoria on April 7, 2009. EBS is a K-5 school which is primarily focused on special needs children. This was the first time Math Mania had been invited to present our activities and puzzles to children with challenges, primarily hearing-impaired students.



PIMS-Uvic Education Coordinator, David Leeming teaches a student from Elizabeth Buckley School

There were almost one hundred participants at the event, including children, parents, teachers and volunteers. Other Math Mania events took place in Vancouver, Chilliwack, Surrey and Tsawwassen.

Melania Alvarez (PIMS BC Education Coordinator), Sharon Friesen (Galileo Educational Network and University of Calgary) and Genevieve Fox (First Nations Adult and Higher Education Consortium in Alberta) had a busy fall organizing the **First Nations Math Workshop**. This November conference brought together elders, math educators, mathematicians, and teachers who have been working with First Nations Communities, at the Banff International Research Station where the main goal was to find ways to move forward in promoting mathematical opportunities for aboriginal students.

The Vancouver Aboriginal Friendship Centre & Simon Fraser University are conducting free math mentorship and tutoring sessions for those interested in learning mathematics. With generous support from SFU, PIMS is providing games, puzzles, and workbooks (created by John Mighton of JUMP math fame) for students. Members of the SFU faculty and PIMS staff work with youth every Tuesday and Thursday, beginning October 13, 2009.



Students from Fezeeka Secondary School

EDUCATING ACROSS CYBERSPACE

Two PIMS-sponsored statistics graduate courses were held in cyberspace this summer, with live broadcasts between UBC, SFU and the University of Washington. Through high resolution, real-time streaming, the lectures were interactive, creating simultaneous dialogue across the three sites. These two courses, the second complementing the first, are the start of what will hopefully become a permanent Environmetrics multicenter whose members will include students, PDFs and experts. This will form a virtual department offering the latest developments in this rich area of the statistical sciences.

SUMMER 2010 EVENTS

MONTE CARLO METHODS FOR QUANTITATIVE
FINANCE

Calgary, Alberta, February 17 - 18, 2010

WESTERN CANADA LINEAR ALGEBRA MEETING

University of Calgary, May 7 - 9, 2010

FIRST MONTREAL SPRING SCHOOL IN GRAPH
THEORY

McGill University, May 7 - 29, 2010

PACIFIC NORTHWEST NUMBER THEORY
CONFERENCE 2010

Simon Fraser University, May 8 - 9, 2010

WORKSHOP ON NON-COMMUTATIVE DYNAMICS
AND QUANTUM PROBABILITY

University of Regina, May 10 - 15, 2010

IGTC SUMMER SCHOOL IN MATHEMATICS
FOR BIOLOGICAL NETWORKS

University of Victoria, May 10 - June 2, 2010

7TH ANNUAL MATHEMATICAL BIOLOGY
WORKSHOP: MATHEMATICS OF BIOLOGICAL
SYSTEMS

University of Alberta, May 11 - 21, 2010

SUMMER SCHOOL IN RISK MANAGEMENT AND
RISK SHARING

University of British Columbia

June 7 - July 9, 2010

WAVE PHENOMENA IV: WAVE IN FLUIDS
FROM THE MICROSCOPIC TO THE PLANETARY
SCALE

University of Alberta, June 14 - 18, 2010

SUMMER SCHOOL ON OPERATOR ALGEBRAS
AND NON-COMMUTATIVE GEOMETRY

University of Victoria, June 14 - 25, 2010

SUMMER SCHOOL ON MODELING AND
COMPUTATION FOR SOCIAL NETWORKS

Whistler, BC, June 20 - 27, 2010

PIMS SUMMER SCHOOL IN PROBABILITY
2010

University of Washington

June 21 - July 10, 2010

CONFERENCE ON SELECTED TOPICS IN
NON-COMMUTATIVE GEOMETRY

University of Victoria, June 27 - July 2, 2010

A MINISEMESTER ON EVOLUTION OF
INTERFACES

Hokkaido University, Sapporo, JAPAN

July 12 - August 13, 2010

PRIMA CONFERENCE ON GEOMETRIC
ANALYSIS

University of British Columbia

July 20 - 30, 2010

45TH ACTUARIAL RESEARCH CONFERENCE

Simon Fraser University, July 25 - 28, 2010

THE MATHEMATICS OF KLEE & GRUNBAUM:
100 YEARS IN SEATTLE

University of Washington, July 28 - 29, 2010

IMA-PIMS-CIMAT GRADUATE INDUSTRIAL
MATHEMATICS MODELING CAMP

Guanajuato, Mexico, August 2 - 11, 2010

CANADIAN ABSTRACT HARMONIC ANALYSIS
SYMPOSIUM 2010

University of Saskatchewan, August 5 - 6, 2010

SUMMER SCHOOL ON COMPUTER MODELS
AND GEOPHYSICAL RISK ANALYSIS

University of British Columbia

August 6 - 10, 2010

2010 CANADIAN CONFERENCE ON
COMPUTATIONAL GEOMETRY

University of Manitoba, August 9 - 11, 2010

NEW TRENDS IN NONCOMMUTATIVE ALGEBRA

University of Washington, August 9 - 14, 2010

IGTC SUMMIT AND WORKSHOP 2010

Naramata, BC, October 1 - 3, 2010

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THEMATIC PROGRAM IN PDE

During the summer of 2009, PIMS hosted a Thematic Program on Partial Differential Equations. The core of this program was a series of nine consecutive week-long workshops, hosted by UBC, UVic, and the Banff International Research Station (BIRS), which brought together many of the world's foremost experts in the field, and a large number of young students and researchers, to address the "state of the art" in a wide range of hot topics. The ambitious scope of the program reflects the power, diversity, and centrality of PDE in the wider world of mathematics, as well as the vigour of the PDE research community internationally, and at PIMS universities in particular.

An essential feature of the Thematic Program was a Summer School for graduate students and postdoctoral fellows, attended by an unprecedented 93 participants, and centred around series of mini-course lectures from leading international scientists: Y. Brenier (CNRS, Nice), L. Caffarelli (Texas), J. Colliander (Toronto), P. Degond (Toulouse), Y. Guo (Brown), B. Kawohl (Cologne), A. Klar (Kaiserslautern), Y. Martel (Versailles), S. Müller (MPI), T. Rivière (ETH), W. Schlag (Chicago), S. Serfaty (NYU), S. Sheffield (NYU), P.E. Souganidis (Chicago) and V. Sverak (Minnesota). The Summer School lectures were integrated into the workshops, each of which included around 20 talks by expert speakers. In this way, participants were given a superb overview of a large and vibrant field.

The themes of the workshops, all rooted in applications to science, ranged from the latest progress on fundamental old questions, to newly emerging applications. The workshop **Regularity Problems in Hydrodynamics** showed that the famous decades-old open (and million-dollar Millennium Prize) problem of regularity for the Navier-Stokes equation is still producing innovative new mathematics, even as its solution remains tantalizingly elusive. The ubiquitous notion of 'optimization' was addressed in the workshop **Asymptotic Analysis in the Calculus of Variations and PDEs**, whose themes included new mathematical approaches to describing and predicting patterns in nature (and elsewhere). Fundamental physics is a traditional and ongoing source of mathematical challenges, a fact made plain by the exciting work discussed in the workshops **Theory and Applications of Classical and Quantum Kinetic Theory**, and **Topics in Kinetic Theory**. As well, current and future engineering applications are driving some of the most sophisticated work in elliptic and parabolic PDE — as represented by the workshop **Analysis of Nonlinear PDEs and Free Boundary Problems: Applications to Homogenization** — and in wave equations — represented by the workshops **Analysis of Nonlinear Wave Equations and Applications in Engineering** and **Nonlinear Dispersive and Geometric Evolution Problems: Singularities and Asymptotics**. The latter workshop also emphasized the important trend towards increasing cross-fertilization between PDE and geometry (as highlighted by the spectacular recent solution of the Poincaré Conjecture). Finally, brand new emerging applications of PDE were on display in the workshops **Multiscale Analysis of Self-Organization in Biology** and **New Connections between Differential and Random Turn Games, PDEs, and Image Processing**, reconfirming the centrality of PDE in science.

The Thematic Program in PDE appears to have been a big success — students, participants, and organizers alike emerged exhausted, but greatly inspired by the fascinating research on display, and the promise of much more exciting and fruitful mathematics to come.

The Program was chaired by PIMS Founder, and BIRS Director, Nassif Ghoussoub.

PIMS/ACCELERATE CANADA
Thematic Program on

 **Partial Differential Equations and Applications**

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THEMATIC PROGRAM IN PROBABILITY

During 2008-2009 a joint CRM-PIMS Thematic Program on Challenges and Perspectives in Probability took place, with events at both CRM and PIMS-UBC. The program showcased the vibrant Canadian community of researchers in probability, as well as the richness of the subject and its vast range of applications to computer science, physics, and biology.

Over five weeks in Vancouver, PIMS hosted two workshops as well as the fourth **PIMS-MITACS Summer School in Probability**. The summer school was made up of two four-week graduate courses, given by David Brydges and Donald Dawson, on "Statistical Mechanics and the Renormalisation Group" and "Stochastic Population Systems," respectively. The summer school had approximately 90 registered participants from many countries. These young researchers were exposed to the latest developments in the use of probabilistic methods in these highly active fields of research. In addition, the thematic program partially supported an enhancement of the UBC Probability Group's postdoctoral training program, which expanded to allow five postdoctoral fellows to be present for the entire academic year 2008-09 (three of whom stayed or are staying for a second year). The 2010 school will take place at the University of Washington and Microsoft Research.

The conference **Random Walks in Random Environments** was held at PIMS at UBC from June 15 - 19, 2009, and was organised by Martin Barlow (UBC), Erwin Bolthausen (Zurich) and Ofer Zeitouni (Technion/Minneapolis). The meeting had 49 registered participants, 25 of whom gave talks. Excellent



Thematic Program in Probability organiser, David Brydges "walking randomly"

feedback was received from participants. Highlights of the meeting were several talks on trapping models for Brownian motions and random walks, including an excellent (blackboard) survey by Gerard Ben Arous (NYU).

The conference **The Renormalization Group and Statistical Mechanics** was organised by David Brydges (UBC), Joel Feldman (UBC), and Aernout van Enter (Groningen). The meeting had over 50 registered participants, 23 of whom gave talks. Some of the highlights included recent progress by the Italian school in the derivation of critical exponents in two dimensional lattice systems, advances in the finite temperature Cauchy-Born problem, insights into the connection between Gibbs structure and choice of renormalisation group map.



Participants of the Renormalization Group and Statistical Mechanics

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PIMS SPRING/SUMMER 2009 EVENTS

The **Canadian Abstract Harmonic Analysis Symposium 2009** was held in May in Edmonton in Honor of Anthony To-Ming Lau on the Occasion of His 65th Birthday

Peter Zvengrowski's magic show amazed and delighted participants of the **Annual North/South Dialogue in Mathematics/Alberta Colleges Mathematics Conference** which took place in Red Deer, in May.

Nearly every speaker gave the audience more open problems than solved ones at the **May Combinatorics, Randomization, Algorithms and Probability Workshop**, which is an indication that the field of probabilistic combinatorics is healthy and developing. Jean-François Le Gall (École normale supérieure), ex-supervisor of Wendelin Werner, discussed random planar maps. A second presentation was by Van H. Vu (Rutgers), who surveyed the major recent results on random matrix theory, most of which were obtained by himself and Terence Tao.



Bamfield, British Columbia

in the beautiful westcoast town of Bamfield, British Columbia. The August course, **Models in Ecology**, was offered at the Bamfield Marine Sciences Centre and was organized and taught by Mark A. Lewis (University of Alberta) and Martin Krkosek (University of Washington). It is part of the program for students of the PIMS International Graduate Training Centre in Mathematical Biology. According to one participant: "The entire course was fantastic." As well, the **IGTC Summit and Workshop** was held on UBC in July.

Jeffrey S. Rosenthal, an award-winning professor & author in the Department of Statistics at the University of Toronto, gave the **PIMS Distinguished Chair Lectures** at UBC and SFU in June. In his public lecture, "The Curious World of Probabilities," Rosenthal provided a probability perspective to explain the mystery behind certain common occurrences. From lotteries to casinos, insurance rates to crime rates, game shows to airline crashes, cancer to SARS, Prof. Rosenthal deconstructed the odds and oddities of chance in an understandable,



Participants of the Annual North/South Dialogue in Mathematics/Alberta Colleges Mathematics in Red Deer, Alberta

Fields Medalist (and PIMS Scientific Review Panel member) Efim Zelmanov (U. California at San Diego) gave the **2009 Niven Lecture** on "Asymptotic properties of finite groups and their applications" at UBC in May. Zelmanov is one of the world's leading algebraists. He is best known for his ground breaking work in Jordan algebras, Lie algebras and combinatorial group theory. In 1994 he was awarded a Fields Medal for his solution of the restricted Burnside problem.

Students learned the methods, models and tools of quantitative ecology in a two-week long summer school

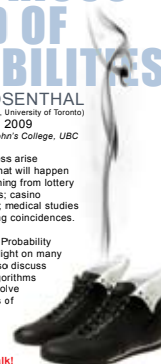
NATIONAL BESTSELLING AUTHOR OF
STRUCK BY LIGHTNING
THE CURIOUS
WORLD OF
PROBABILITIES

JEFFREY S. ROSENTHAL
(Professor, Department of Statistics, University of Toronto)
7:30 - 9:30 PM June 4, 2009
Fairmont Social Lounge, St. John's College, UBC

Probabilities and randomness arise whenever we're not sure what will happen next. They apply to everything from lottery jackpots to airplane crashes; casino gambling to homicide rates; medical studies to election polls to surprising coincidences.

This talk will explain how a Probability Perspective can shed new light on many familiar situations. It will also discuss "Monte Carlo" computer algorithms which use randomness to solve problems in many branches of science.

A background in science and mathematics is not necessary to enjoy this talk!



PIMS DISTINGUISHED CHAIR LECTURE SERIES

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relevant and irreverent exploration. Randomness, uncertainty and probability are everywhere, and while no one can predict uncertain events with certainty, we can at least understand uncertainty itself!

In May PIMS put on its annual industrial extravaganza: the **Graduate Industrial Mathematics Modeling Camp (GIMMC)** and the **Industrial Problem Solving Workshop (IPSW)**. This two week intensive learning experience at the University of Calgary was designed to give graduate students in the Mathematical Sciences an opportunity to learn industrial mathematical modelling techniques under the guidance of renowned industrial researchers. During the first week mentors presented challenging industrial problems and guided participants through the resolution process using a range of different mathematical modeling techniques. The Camp was preparation for the Industrial Problem Solving Workshop that followed, this providing a unique opportunity to work on real-world results relevant to industry.

Uffe Haagerup (U. of Southern Denmark) was the headline speaker at the **37th Canadian Operator Symposium** in Regina in May. This was an activity of the Collaborative Research Group 20 on "Operator Algebras and Noncommutative Geometry," as was the June-July **Workshop on KMS States in Noncommutative Geometry** at UVic. This meeting included a week's worth of minicourses, and the following workshop facilitated significant progress on the classification of Carey-Phillips-Rennie algebras.



Workshop on Geometry Related to the Langlands Program

Starting in the summer, the University of Regina welcomed **Distinguished Lecturers** R. Horn (University of Utah), J. Chen (Texas A&M University), J. Mingo (Queen's University) and A. Pianzola (University of Alberta), who spoke on canonical matrix forms, parametrized computation, operator algebras and the language of forms, respectively.

Topics discussed at the well-received **Workshop on Statistical Methods for Dynamic System Models** included fisheries management, neuroscience, epidemiology, criminology, systems biology, seismology, chemical engineering, computer science, genetics and more! All this happened at SFU in June.

A one-day **Symposium in Honour of** (PIMS' own) **David Brydges and Joel Feldman**, on the occasion of their 60th birthdays occurred in early July. This drew a large crowd of colleagues and friends, and ended with a dinner and numerous speeches.

The inaugural **Pacific Rim Mathematical Association (PRIMA) Congress** was held at the University of New South Wales, Sydney, Australia, in July. PRIMA is an association of mathematical sciences institutes, departments and societies from around the Pacific Rim, established in 2005 with the aim of promoting and facilitating the development of the mathematical sciences throughout the Pacific Rim region. About 500 mathematical scientists attended the meeting.

Kinetic Theory was the subject of a summer school at UVic in June. Topics covered by the principal lecturers included: describing flocking and milling effects among animal swarms, with birds, insects and sheep among the examples; obtaining better existence and uniqueness results for initial-boundary value problems of the



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Boltzmann equation; and fiber laydown on a conveyor belt (a process which is used in non-woven textile production, where this problem originated). The event succeeded in introducing and tutoring many young colleagues as well as many of the invited speakers in the power and scope of kinetic methods.

The annual **Canadian Young Researchers Conference in Mathematics and Statistics** provides a unique forum for young mathematicians across Canada to present their research and to collaborate with their peers. Participants had the opportunity to build and strengthen lasting personal and professional relationships, to develop and improve their communication skills, and to gain valuable experience in the environment of a scientific conference. This year's conference took place at the University of Calgary, and a highlight was a public lecture by Richard K. Guy titled: "How Not to be a Graduate Student."



Attendees of the Canadian Young Researchers Conference in Mathematics and Statistics

The Goldeye Resort outside Nordegg, Alberta, was the site of this July's **Alberta Topology Seminar Retreat**.



Edmonton, Alberta

PIMS helped support the **International Conference on Mathematical Biology & the Annual Meeting of the Society for Mathematical Biology** at UBC in July, and the **Foundational Methods in Computer Science 2009** at UBC in May.

Cryptography was key at the University of Calgary in August, which hosted both the **Selected Areas in Cryptography 2009** conference and the **Workshop on Elliptic Curve Cryptography**. At the latter, a public lecture was given by Professor Scott Vanstone, who is one of the visionaries in the field. Professor Vanstone gave an insightful and well-attended public lecture aimed at the general public and was able to emphasize the

importance of public key cryptography in our everyday lives.

The **PIMS Undergraduate Summer School in Algebra** introduced University of Alberta and other undergrads to algebraic geometry, Lie theory and number theory. The school featured special lectures by Georgia Benkart (University of Wisconsin).

The CRG on Environmetrics helped organize an **Intensive Course for Young Researchers on Statistical Software for Climate Research** and an **Interdisciplinary Workshop on the Effects of Climate Change** in Malta in March.

Other activities included the **2009 Pacific Northwest Geometry Seminar** at UBC in May; the **Spring Research Conference on Statistics in Industry and Technology** in Coquitlam, BC, also in May; the **Statistical Society of Canada Annual Meeting** at UBC in early June. The PIMS site at Portland State University organized the **International Seminar on Low-Dimensional Homotopy Theory and Combinatorial Group Theory** held in July in Joseph, OR. In August UW hosted the **Summer School on Seismic Imaging** and UBC-Okanagan held the **Prairie Discrete Mathematics Workshop (PDMW) 2009**.

In Vancouver in August, PIMS collaborated with the Canadian Mathematical Society and the Sociedad Matematica Mexicana to host the **Second CMS-SMM Joint Meeting**. Kyoto University was the location of the February PIMS-GCOE sponsored meeting on **Random Processes and Systems**.



Here's Lookin' at Euclid!

CRM - FIELDS - PIMS PRIZE WINNER ANNOUNCED

The Directors of CRM, Fields and PIMS, are pleased to announce that Gordon Slade from the University of British Columbia is the recipient of the 2010 CRM-Fields-PIMS Prize. The award recognises his outstanding work in rigorous statistical mechanics and probability. He is renowned for developing a technique known as the lace expansion into a systematic calculus which he has applied to diverse and famous problems including self-avoiding walk, percolation, branched polymers, random graphs, and numerical techniques for the exact enumeration of self-avoiding walks.

In 1992 Hara and Slade proved that in five or more dimensions the end-to-end distance of self-avoiding walk grows according to the same \sqrt{n} law exhibited by simple random walk and that the scaling limit of self-avoiding walk is Brownian motion.

In 1989 Hara and Slade proved that the Aizenman-Newman triangle condition holds for critical percolation in high dimensions. The triangle condition implies a large collection of properties for the critical cluster that are collectively summarised by the term "mean field theory". Since this initial impetus a quite complete understanding of critical percolation clusters in high dimensions has grown out of work with his co-authors Derbez, Hara, van der Hofstad and den Hollander. In particular, the scaling limit of oriented percolation is super-Brownian motion and the existence and the properties of the incipient infinite percolation cluster have been established in certain cases. By related methods with Slade and his co-authors have established a very complete description of the critical window for the Hamming cube with randomly deleted edges.

Gordon Slade received his undergraduate degree from the University of Toronto in 1977 and completed his Doctoral degree with Lon Rosen and Joel Feldman at the University of British Columbia in 1984. He was Lecturer at the University of Virginia from 1985 to 1986. In 1986 he joined the faculty of McMaster University and since 1999 he has been Professor of Mathematics at the University of British Columbia.



2010 CRM - Fields -
PIMS Prize Winner
Gordon Slade

DAVID BRYDGES AND ZINOVY REICHSTEIN INVITED TO GIVE TALK AT ICM 2010 IN HYDERABAD

PIMS Deputy Director David Brydges has been invited to speak at the next International Congress of Mathematicians to be held in Hyderabad, India. His talk will address self-avoiding walks in four dimensions. In the algebra session, UBC Professor and PIMS collaborator, Zinovy Reichstein will be speaking on the topic of essential dimension. The International Congress of Mathematicians (ICM) is the largest congress in the mathematics community. It is held once every four years under the auspices of the International Mathematical Union. The Fields Medals, the Nevanlinna Prize, and the Gauss Prize are awarded during the Congress' opening ceremony. In the 2010 ICM, a new prize also will be awarded, the Chern Medal Award.

PIMS/IGTC FELLOWSHIPS NAMED

Jun Allard, William Carlquist, Jonathan Martin, Kelly Paton Romain Richard, Ulrike Schlaegel, Marie Varughese were awarded Fellowships through the PIMS-Sponsored International Graduate Training Centre in Mathematical Biology for the 2009 - 2010 academic year. The PIMS International Graduate Training Centre (IGTC) in Mathematical Biology started in September 2007, focusing on the training of graduate students in mathematical biology at PIMS universities.



CAIMS/PIMS
Early Career Award in
Applied
Mathematics

The CAIMS/PIMS Early Career Award in Applied Mathematics recognizes exceptional research in any branch of applied mathematics, interpreted broadly. The nominee's research should have been conducted primarily in Canada or in affiliation with a Canadian university. The prize is to be awarded to a researcher less than ten years past the date of Ph.D. at the time of nomination.

Application Deadline:
January 31, 2010

www.pims.math.ca/essential-information/opportunities