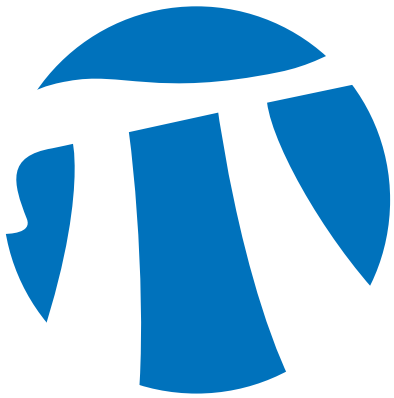

Pacific Institute *for the* Mathematical Sciences

2009 Annual Report

PIMS OVERVIEW

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1. Background

The Pacific Institute for the Mathematical Sciences (PIMS) was founded in 1996 by a consortium of five universities in Alberta and British Columbia (the University of Alberta, the University of Calgary, the University of British Columbia, Simon Fraser University and the University of Victoria). Later they were joined by the University of Washington in the United States and more recently by the University of Regina and the University of Saskatchewan as full members, and by the University of Lethbridge and Portland State University in Oregon as affiliates. The mandate of PIMS is to:

- promote research in and the application of the mathematical sciences of the highest international caliber,
- facilitate the training of highly-qualified personnel at the graduate and postdoctoral levels,
- enrich public awareness of mathematics through outreach,
- enhance the mathematical training of teachers and students in K-12, and
- create partnerships with similar organizations in other countries, with a particular focus on Latin America and the Pacific Rim.

2. Unique Structure of PIMS

PIMS is unique in several ways, most fundamentally because of its distributed structure. Most institutes organize activities at a central location where international scientists are brought in residence; PIMS, on the other hand, has a site at each of eight major universities in Alberta, British Columbia, Saskatchewan and Washington State. PIMS events and programs are organized at each of the eight sites, and PIMS' researchers are distributed throughout the network. PIMS is institutionally bi-national (the University of Washington is a full member, and Portland State University is an affiliate) and it is the only institute of this kind in mathematics. This unique international structure projects PIMS beyond the boundaries of Canada, notably towards the Pacific Rim, to allow Canada to benefit from international scientific and economic developments.

3. Scientific Highlights

PIMS has built an international reputation for excellence and has transformed the conditions of mathematical research in Canada. PIMS funds Collaborative Research Groups, Post-Doctoral Fellowships as well as individual events and programs on a competitive basis. The following is a partial list of current scientific highlights:

- The innovative PIMS *Collaborative Research Groups* (CRG) aim to develop permanent research and training networks, establishing lasting interdisciplinary links between geographically separate groups of researchers at member universities. PIMS has developed 22 CRGs since its inception, in areas ranging across all the mathematical sciences. This has served as a catalyst for producing mathematical research of the highest quality in Canada and attracting outstanding faculty to PIMS' universities. In 2010 two new CRGs on *Number Theory* and *The Mathematics of Quantum Information* will get underway.

- Every year PIMS sponsors numerous *postdoctoral fellows* (PDFs), attracting outstanding young scientists who contribute to PIMS research programs, many of whom later become faculty members at Canadian universities. They are distributed throughout PIMS' sites on a competitive basis.

- In 2007, PIMS launched the *International Graduate Training Centre in Mathematical Biology*. This is a graduate training program focused on strategic topics of great current interest such as the mathematical modeling of ecosystems. Special fellowships are awarded to students and there are conferences and research summits connected to the program. This represents a coordination of resources and ideas from several PIMS sites, further emphasizing contact between the student community and the frontiers of scientific research.

- PIMS organizes international summer schools to train the new generation of mathematical scientists in emerging areas of mathematics and its applications as diverse as seismic imaging, string theory, atmospheric modeling, environmetrics and mathematical finance.

- PIMS has a lively program in industrial mathematics, and runs *Graduate Industrial Mathematical Modeling Camps* as well as *Industrial Problem Solving Workshops* for students, faculty and industry. PIMS has also recently developed focused industrial programs in areas of strategic interest, such as a project on the mathematics of oil exploration (based in Calgary) that connects the oil industry with world-class academics working in geomathematics. Continuing in this direction, in August of 2009 PIMS held a *Summer School in Seismic Imaging* in Seattle.

• Each year PIMS awards several prestigious prizes. In 2009, the *CRM-Fields-PIMS Prize* went to Gordon Slade of UBC, and Gerda de Vries of UA was the recipient of the *PIMS Education Prize*. This year CAIMS and PIMS created the *Early Career Award in Applied Mathematics* to recognize exceptional research in any branch of applied mathematics. The award will consist of a cash prize and a commemorative plaque that will be presented at the CAIMS Annual Meeting. The recipient will be invited to deliver a plenary lecture at the CAIMS Annual Meeting in the year of the award.

4. National and International Collaborations

PIMS has taken a leadership role in both the national and international mathematical communities. In partnership with the two other mathematical institutes in Canada, it has created major national programs such as MITACS (Mathematics of Information Technology and Complex Systems) and AARMS (Atlantic Association of Research in the Mathematical Sciences). Together with the Mathematical Sciences Research Institute (MSRI) in Berkeley, it created the Banff International Research Station (BIRS), which is now the premier mathematical research station in North America.

PIMS has built close partnerships with mathematical institutes in Mexico and Chile, and has been instrumental in creating the Pacific Rim Mathematical Association (PRIMA), a network of mathematical institutes in Canada, the United States, Mexico, Chile, New Zealand, Australia, Singapore, China, Korea, and Japan, bound by a cooperative agreement. The first PRIMA Congress was held in July 2009 in Sydney, Australia, and had over 400 participants. PIMS is also affiliated with the Centre National de la Recherche Scientifique (CNRS), the French national agency for scientific research, as an “Unité Mixte Internationale”, thus allowing PIMS to host French researchers throughout its different sites (see section **II.2**).

In 2009, PIMS partnered with the Centre de Recherches Mathématiques (CRM) to organize a highly successful thematic program on “Challenges and Perspectives in Probability” with events held in both Montreal and Vancouver. We also partnered with the Fields Institute in Toronto to run a workshop on “Discovery and Experimentation in Number Theory” at Simon Fraser University. Several of our events in 2009 were organized in collaboration with MITACS.

In 2009 PIMS also signed cooperative agreements with three distinguished international institutions: RIMS/Kyoto University, the Mathematical Sciences Institute at the Australian National University and with the NSF-funded Institute for Mathematics and its Applications in Minnesota. In February 2009 PIMS co-organized a symposium in probability in Japan with RIMS/Kyoto University. Finally, in August 2009 PIMS hosted the second joint meeting of the Canadian and Mexican mathematical societies, an event that brought together the two communities, helping to establish new links between researchers.

5. Administrative Structure and Funding for PIMS

The central office and the Director of PIMS are based at UBC, and each of the other seven universities has a PIMS site office and a site director (see *pims.math.ca/contact*). The role of the site directors is to look for local opportunities and synergies, while the PIMS site offices provide administrative assistance for organizing on-site PIMS' activities. The distributed structure has allowed the institute to locally support and energize departments of mathematical sciences across Western Canada.

The strong presence of PIMS at the university level gives it access to a vast reservoir of scientists from all disciplines. Over the years, PIMS has been able to lower disciplinary barriers, and create innovative research teams, making a sustained effort to extend the PIMS community beyond mathematics and statistics departments so as to include scientists in areas such as physics, biology, engineering, informatics, operations research and economics.

The governing structure of PIMS consists of **Alejandro Adem** (Director), **David Brydges** (Deputy Director) and **Mark Gotay** (Assistant Director), all of whom are located at PIMS Central at the University of British Columbia. [**George Homsy** will take over as Deputy Director and UBC site director on 01/01/10]. PIMS' operations are overseen by its *Board of Directors*, which includes a senior academic administrator from each of the founding universities and representatives from the business, industry and resource sectors and professional societies. Board Members are listed at *pims.math.ca/pims-glance/board-directors*. Scientific events are adjudicated by an independent *Scientific Review Panel* composed of internationally renowned mathematical scientists. For biographies of Panel members, see *pims.math.ca/pims-glance/scientific-review-panel*. PIMS' Site Directors are Rustum Choksi (SFU), Charles Doran (UA), David Brydges (UBC), Clifton Cunningham (UC), Shaun Fallat (UR), Raj Srinivasan (US), Reinhard Illner (UV) and Gunther Uhlmann (UW).

PIMS receives funding from NSERC, its member universities, and provincial governments. It also receives contributions from industry and private donors for specific events such as the Summer Math Camps for Aboriginal Students. Its events are co-sponsored by funding agencies such as the US National Science Foundation, the Centre de Recherches Mathématiques (CRM), the Fields Institute, MITACS, and by international partner institutions such as PRIMA, Universidad Nacional Autónoma de México and the Centre National de la Recherche Scientifique. Other partners include MapleSoft, Nelson Education, TD Bank, Pearson, Wiley, CAIMS, Statistical Society of Canada, CMS, International Association for Cryptologic Research (IACR), Springer-Verlag, Society for Mathematical Biology, FP Innovations, SYREON, Federal Interlocutor for Métis and Non-status Indians, Capital One, STATA, SAS, W.H. Freeman & Co., JMP, ASA/SPES, IMS, Kyoto University Global COE Program, SEAMOCS, CIBC, STINT, ENCORA, and Quest 4D. PIMS's annual budget is approximately $3 million, with roughly one-third of this amount coming from NSERC.

On April 6, 2009, BC Premier Gordon Campbell announced major provincial funding for the UBC Earth Systems Science Building, a state-of-the-art education and research facility. The north end of the fourth floor of this building will be the new home of PIMS Central. This is a significant development for PIMS-UBC, as its new location will be at the heart of the UBC campus, surrounded by departments ideally suited for the interdisciplinary research spearheaded by PIMS. For details on PIMS' new quarters, see *science.ubc.ca/news/259*.

6. PIMS' Educational and Outreach Activities

PIMS has a mandate to promote mathematics vigorously in Canada, and takes upon itself the mission to help provide the elements for success that are necessary for current and future generations of teachers, scientists and engineers. In addition, the educational programs at PIMS advocate strongly for, and find models and activities to facilitate, the participation of people of all backgrounds in the mathematical endeavour. PIMS is actively involved in promoting mathematical outreach events in schools throughout Western Canada. These involve students, teachers and parents and seek to convey the excitement of discovery and learning that underlies mathematics and its applications.

PIMS has developed a partnership with First Nations schools in British Columbia which is supported by the BC and local governments as well as by private donors. The activities under this program include summer camps for students, teacher training sessions and a coordinated mentoring program where undergraduate students from universities work with local teachers and students to provide support in mathematics. In 2009 we received funding from the federal government for these programs.

Colleges and universities within the BC and Alberta post-secondary systems that do not qualify for regular membership to PIMS may become *PIMS Education Associates*. PIMS' educational network allows for the exchange of successful practices in outreach, teaching and professional development amongst its members. Currently PIMS has nine educational associates in Alberta and British Columbia.

More information about PIMS can be obtained at *pims.math.ca*.

PIMS' CURRENT ACTIVITIES

PIMS' efforts are focused in several overlapping directions: scientific, postdoctoral training, and educational. We discuss actual and planned activities as well as accomplishments in these areas below.

1. Scientific

PIMS' scientific activities divide into "Programs" and "Stand-alone Events." Under Programs, PIMS enables and funds Thematic Programs, Collaborative Research Groups (CRG) and the International Graduate Training Centre (IGTC) amongst the affiliated universities and PIMS' sister institutes. Under Stand-alone Events, PIMS sponsors and facilitates conferences and workshops, runs summer schools for graduate students, finances Lecture and Seminar Series, and cultivates interactions between academia and industry via various Industrial Activities. These activities typically take place at PIMS institutions around the Pacific Northwest and Prairie Provinces, but can range as far afield as Malta and Australia. Some of these activities are a way to prepare later developments. The Sydney meeting played this role for our Pacific Rim initiatives.

A. Numbers and Types of Activities

- **Conferences and Workshops:** PIMS organizes and/or funds a variety of meetings around North America and the Pacific Rim each year. These range from small one-day workshops to multi-week conferences involving hundreds of participants. The larger meetings are selected each year on a competitive basis by the PIMS Scientific Review Panel. Smaller events are often funded at the discretion of the Director and Deputy Director.

- **Summer Schools:** Every year PIMS runs a number of topical summer schools. They are intended to educate graduate students and early career researchers on current developments.

- **Collaborative Research Groups:** *Collaborative Research Groups* (CRG) consist of researchers with a common interest, and with a desire to collaborate in developing aspects of their research programs. Groups organize thematic activities, such as workshops and summer schools as well as seminars, make joint postdoctoral fellowship (PDF) appointments, or develop joint graduate training programs. CRGs are designed to promote and support longer term, multi-event, multi-site coordinated activities. During its period of operation, typically 3-4 years, a CRG can expect to receive priority access to the full gamut of PIMS' resources. See *pims.math.ca/scientific/collaborative-research-groups* for more information.

- **Thematic Programs:** These intensive activities each cover a specific but substantial area of research of current importance to Canada in the mathematical sciences, with participants ranging from students to world experts. Thematic Programs are special opportunity events that take place approximately every 2-3 years, depending on current mathematical trends. They are usually concentrated in the four summer months, are often associated with CRGs, and are typically assigned a complement of PIMS PDFs. Proposals are evaluated by the PIMS Scientific Review Panel to ensure the highest scientific quality and appropriateness of the subject.

- **Lecture & Seminar Series:** PIMS supports various ongoing seminar series at member universities and industrial centers throughout the year. Some of these are for specialists, while others are geared towards the general public, with the goal of inculcating in the citizenry the importance of mathematical research and its applications.

- **International Graduate Training Center:** Recognizing the importance of mathematics in biology, in 2007 PIMS created the International Graduate Training Center in Mathematical Biology. This develops a specialized graduate program shared between several PIMS universities. PIMS serves as a catalyst, by supporting the program with summer schools, and bringing to them international students; arranging for distinguished visitors from partner institutions to teach in the program; and awarding graduate fellowships to the program. After five years of operation, PIMS financial support to this IGTC will be reviewed, to allow a new IGTC to be opened in another critical area. See *pims.math.ca/scientific/igtc*.

- **Industrial Activities:** PIMS also fosters collaborations with industry. *Industrial Problem Solving Workshops* (IPSW) are based on the Oxford Study Group Model, in which problems of interest to participating industrial companies are posed to the workshop attendees. Participating graduate students and faculty spend five days working on the problems, and the results are published. The advantages for participating students and academics are: (i) The challenge of applying one's skills to new and relevant problems directly applicable to industry. (ii) The opportunity for continued collaboration with the workshop's academic and industrial participants. (iii) Helping PIMS and mathematics by demonstrating to businesses and governments the tangible benefits of supporting the mathematical sciences.

PIMS *Graduate Industrial Mathematics Modeling Camps* (GIMMC) have graduate students from Canadian universities attend to learn various aspects of high-level techniques for solving industrial mathematics problems. The camp prepares them for the PIMS IPSW, which typically follows the GIMMC.

As well, industrial workshops, short courses, mini-courses, summer schools and seminar series are organized by PIMS researchers, with topics of interest to both industry and academia, which serve to disseminate newly developed mathematical tools that can be of use in industry. For instance, with the sponsorship of Shell Canada Limited, PIMS presents a series of lunch hour lectures at Calgary Place Tower 1. These lectures, given by experts from the PIMS' universities, focus on mathematical techniques and applications relevant to the oil and gas industry and demonstrate the utility and beauty of applied mathematics. The talks – 6 in 2009 – are aimed at a general audience. See *pims.math.ca/industrial/all-events* for more information.

Figure 1: Numbers of each type of activity supported by PIMS by year.

Activity	2008	2009	2010
Conferences/Workshops	49	43	23
Summer Schools	9	8	10
Collaborative Research Groups	10	6	7
Thematic Programs	-	2	-
Lecture and Seminar Series	4	17	19
International Graduate Training Centre	1	2	2
Industrial	4	3	5
Other	1	2	2

Summer Thematic Programs are special events that take place every 2-3 years, depending on exceptional opportunities. In 2009 two such events took place simultaneously, which was a first time occurrence at PIMS. Consequently, this led to a substantial increase in the number of workshops and conferences for 2009. PIMS was also asked to host or cosponsor several meetings by professional societies such as the CMS, SMB and SSC in 2008 and 2009.

Our focus for 2010 is a more geographically distributed menu of mathematical events with reduced involvement in meetings primarily organized by professional societies. For 2011 we are planning thematic programs in Applied Mathematics and in Number Theory, the first built around the ICIAM 2011 meeting in Vancouver and the second on activities organized by the recently created CRG in Number Theory.

All activities are listed individually below. The sheer number of PIMS' endeavours precludes us from doing more than merely mentioning them here; however, details about specific activities can be obtained at pims.math.ca or by request. Such details typically include lists of organizers and plenary speakers, titles and abstracts of talks, scientific background and summaries, schedules, and so forth. Because of their importance, more detail is given on the CRGs, the IGTC and the Thematic Programs in sections D–F following.

B. Listing of Activities: 2009

- **Conferences and Workshops**

1. *8th Pacific Northwest PDE Meeting*, University of British Columbia, January 17.
2. *2009 Applied Math Graduate Student Conference*, Simon Fraser University, January 24.
3. *Random processes and systems*, Kyoto, Japan, March 16–19.
4. I*ntensive Course for Young Researchers on Statistical Software for Climate Research*, Sliema, Malta, March 16–17.
5. *Interdisciplinary Workshop on the Effects of climate change: coastal systems, policy implications, and the role of statistics*, Sliema, Malta, March 18–20.
6. *Sixth Combinatorics Day*, University of Lethbridge, March 27.
7. *ABC Algebra Workshop*, University of Calgary, April 18–19.
8. *Cascade Topology Seminar*, University of British Columbia, April 25–26.
9. *Third Annual Meeting of the Prairie Network for Research in Mathematical Sciences and Student Workshop*, US, April 29–May 1.
10. *Alberta Number Theory Day II*, University of Calgary, April 30.
11. *Annual North/South Dialogue in Mathematics*, Red Deer College, AB, May 2.
12. *2009 Pacific Northwest Geometry Seminar*, University of British Columbia, May 2–3.
13. *Combinatorics, Randomization, Algorithms and Probability*, Centre de recherches mathématiques, May 4–8.
14. *Canadian Abstract Harmonic Analysis Symposium 2009*, University of Alberta, May 11–15.
15. *New Directions in Random Spatial Processes*, Centre de recherches mathématiques, May 11–15.
16. *Canadian Discrete and Algorithmic Mathematics Conference*, Centre de recherches mathématiques, May 25–28.
17. *Canadian Operator Symposium*, University of Regina, May 26–30.
18. *Spring Research Conference on Statistics in Industry and Technology*, Coquitlam, BC, May 27–29.
19. *Workshop on Geometry Related to the Langlands Program*, University of Ottawa, May 27–31.
20. *Statistical Society of Canada Annual Meeting 2009*, University of British Columbia, May 31–June 3.
21. *Workshop on Statistical Methods for Dynamic System Models*, Simon Fraser University-Vancouver, June 4–6.
22. *Canada/Korea Special Session on Algebraic Geometry and Topology*, St. John's, NL, June 6–8.
23. *Random Walks in Random Environments*, University of British Columbia, June 15–19.
24. *Workshop on KMS States in Non-commutative Geometry*, University of Victoria, June 29–July 10.
25. *Symposium in Honour of David Brydges and Joel Feldman*, University of British Columbia, July 5.

26. *The Renormalization Group and Statistical Mechanics*, University of British Columbia, July 6–10.
27. *First PRIMA Congress*, University of New South Wales, Sydney, July 6–10.
28. *International Seminar on Low-Dimensional Homotopy Theory and Combinatorial Group Theory*, Joseph, Oregon, July 12–21.
29. *Sixth Canadian Young Researchers Conference*, University of Calgary, July 17–19.
30. *Alberta Topology Seminar Retreat 2009*, Nordegg, Alberta, July 27–30.
31. *Selected Areas in Cryptography 2009 (SAC 2009)*, University of Calgary, August 13–14.
32. *Second Canadian Mathematical Society - Sociedad Matematica Mexicana Meeting 2009*, University of British Columbia, August 13–15.
33. *Prairie Discrete Mathematics Workshop (PDMW) 2009*, University of British Columbia-Okanagan, August 22–23.
34. *Workshop on Elliptic Curve Cryptography*, University of Calgary, August 24–26.
35. *Workshop on Discovery and Experimentation in Number Theory*, Simon Fraser University & Fields Institute, September 22–26.
36. *2009 Pacific Northwest Numerical Analysis Seminar*, University of British Columbia, September 26.
37. *Northwest Functional Analysis Seminar*, Banff, AB, October 16–18.
38. *Cascade Topology Seminar*, University of Oregon, October 24–25.
39. *Pacific Northwest Probability Seminar*, University of Washington, October 24.
40. *West Coast Optimization Meeting*, Simon Fraser University-Surrey, October 25.
41. *Mini-symposium in PDE*, University of British Columbia, November 12–13.
42. *Joint UBC/SFU Graduate Student Workshop in Statistics*, Simon Fraser University, November 21.
43. *Combinatorial Potlatch 2009*, Simon Fraser University-Vancouver, November 21.

PIMS also provided administrative support for a number of conferences and workshops, including:

1. *Foundational Methods in Computer Science 2009 (FMSC 2009)*, University of British Columbia, May 29–31.
2. *International Conference on Mathematical Biology & the Annual Meeting of the Society for Mathematical Biology*, University of British Columbia, July 27–30.

- **Summer Schools**

1. *PIMS Undergraduate Algebra Summer School*, University of Alberta, May 25–June 4.
2. *Summer School in Probability: An ACCELERATE BC Graduate Training Event*, University of British Columbia, June 8–July 3.
3. *PIMS/Accelerate Canada Summer School in PDE: Topics in Kinetic Theory*, University of Victoria, June 29–July 3.
4. *PIMS/Accelerate Canada Summer School in PDE: Asymptotic Analysis in the Calculus of Variations and PDEs*, University of British Columbia, July 6–10.
5. *PIMS/Accelerate Canada Summer School in PDE: Analysis of nonlinear PDEs and free boundary problems: applications to homogenization*, University of British Columbia, July 20–24.
6. *PIMS/Accelerate Canada Summer School in PDE: New connections between differential and random term games and elliptic and parabolic differential equations*, University of British Columbia, July 27–31.
7. *PIMS/Accelerate Canada Summer School in PDE: Regularity problems in hydrodynamics*, University of British Columbia, August 3–7.
8. *PIMS/Accelerate Canada Summer School in PDE: Nonlinear dispersive and geometric evolution problems - singularities and asymptotics*, UBC, August 17–21.

- **Collaborative Research Groups**

1. *CRG 14 – Geometric Analysis*, 2007–2010.
2. *CRG 15 – Environmetrics*, 2007–2010.
3. *CRG 16 – Mathematical Problems in Climate Modeling: Multiscale Processes in the Tropics*, 2007–2010.
4. *CRG 18 – Bayesian Modeling and Computation for Networks*, 2008–2010.
5. *CRG 19 – Partial Differential Equations*, 2008–2011.
6. *CRG 20 – Operator Algebras and Non-commutative Geometry*, 2009–2011.

- **Thematic Programs**

1. *Partial Differential Equations*.
2. *Challenges and Perspectives in Probability*.

- **Lecture & Seminar Series**

1. *IAM-PIMS-MITACS Distinguished Colloquium Series*, University of British Columbia.
2. *PIMS Postdoctoral Colloquium Series*, University of British Columbia.
3. *2009 CRM-Fields-PIMS Prize Lecture*, University of British Columbia.
4. *The AMI Seminar Series*, University of Alberta.
5. *PIMS Vancouver Econometrics Workshops*, University of British Columbia.
6. *PIMS Distinguished Lecture Series*, University of Regina.
7. *Alberta Topology Seminars*, University of Calgary.
8. *Niven Lecture Series*, University of British Columbia.
9. *PIMS Distinguished Chair Lecture Series*, University of British Columbia / Simon Fraser University.
10. *PIMS/CSC Distinguished Lecture Series*, Simon Fraser University.
11. *Seminars on Analysis and Partial Differential Equations*, University of Calgary.
12. *UW-PIMS Colloquium*, University of Washington.
13. *Seminars and Colloquia at the University of Victoria*, University of Victoria.
14. *Bellingham Algebraic Geometry Seminar*, Western Washington University.
15. *West End Number Theory Seminar*, University of Calgary.
16. *Applied Mathematics Seminar*, University of Saskatchewan.
17. *Seminar on Mathematical Modeling in Public Health*, University of Alberta.

PIMS Central also hosted several seminar series in the Department of Mathematics at the University of British Columbia during 2009, including the *Algebraic Geometry, Topology, Differential Geometry-Mathematical Physics-PDE, Discrete Mathematics, Mathematical Biology, Number Theory, Probability* and the *SCAIM Seminars*.

- **International Graduate Training Centre in Mathematical Biology**

1. *Graduate Research Summit of the IGTC in Mathematical Biology*, University of British Columbia, July 24–25.
2. *Models in Ecology, IGTC Graduate Summer School in Mathematical Biology*, Bamfield, BC, July 27–August 14.

- **Industrial Activities**

1. *PIMS Graduate Industrial Mathematics Modelling Camp and Industrial Problem Solving Workshop*, Universty of Calgary, May 19-29.
2. *Summer School in Seismic Imaging*, University of Washington, August 10–14.
3. *PIMS/Shell Lunchbox Lecture Series*, Calgary.

- **Other**

1. *PIMS/UBC Information Session on Grant Opportunities*, University of British Columbia, April 14.
2. *PIMS Postdoc/Grad Student Job Forum*, University of British Columbia, October 6.

In addition, PIMS provided support for: the *Laboratory for Complex and Non-Newtonian fluid flow*, the *Association for Women in Mathematics*, and *AARMS*.

C. Listing of Planned Activities: 2010

- **Conferences and Workshops**

1. *Cascade Topology Seminar*, BIRS, Spring.
2. *9th Pacific Northwest PDE Meeting*, Spring.
3. *Joint UBC/SFU Graduate Student Workshops in Statistics*, Simon Fraser University, Spring.
4. *2010 Pacific Northwest Geometry Seminar*, Spring.
5. *Western Canada Linear Algebra Meeting*, University of Calgary, May 7–9.
6. *Pacific Northwest Number Theory Conference 2010*, Simon Fraser University, May 8–9.
7. *Workshop on Non-commutative Dynamics and Quantum Probability*, University of Regina, May 10–15.
8. *7th Annual Mathematical Biology Workshop: Mathematics of Biological Systems*, University of Alberta, May 11–21.
9. *Wave Phenomena IV: Waves in Fluids from the Microscopic to the Planetary Scale*, University of Alberta, June 14–18.
10. *Conference on Selected Topics in Non-commutative Geometry*, University of Victoria, June 27–July 2.
11. *PRIMA Conference on Geometric Analysis*, University of British Columbia, July 20–30.
12. *Workshop on quantum algorithms, computational models, and foundations of quantum mechanics*, Univeristy of British Columbia, July 23–25.

13. *New Researchers in Statistics Conference*, University of British Columbia, July 27–30.
14. *The Mathematics of Klee & Grunbaum: 100 Years in Seattle*, University of Washington, July 28–29.
15. *Canadian Abstract Harmonic Analysis Symposium 2010*, University of Saskatchewan, August 5–6.
16. *2010 Canadian Conference on Computational Geometry*, University of Manitoba, August 9–11.
17. *New Trends in Noncommutative Algebra*, University of Washington, August 9–14.
18. *Joint UBC/SFU Graduate Student Workshops in Statistics*, Simon Fraser University, Fall.
19. *Cascade Topology Seminar*, University of Washington, Fall.
20. *Pacific Northwest Probability Seminar*, Fall.
21. *Bellingham Algebraic Geometry Seminar*, Western Washington University, Fall.
22. *West Coast Optimization Meeting*, Fall.
23. *Alberta Number Theory Day*, BIRS.

- **Summer Schools**

1. *First Montreal Spring School in Graph Theory*, McGill University, May 2–29.
2. *Summer School in Risk Management and Risk Sharing*, University of British Columbia, June 7–July 9.
3. *Summer School on Operator Algebras and Non-commutative Geometry*, University of Victoria, June 14–25.
4. *Modeling and Computation for Social Networks*, Whistler, BC, June 20–27.
5. *PIMS Summer School in Probability 2010*, University of Washington, June 21–July 7.
6. *Inverse Problems and PDE Summer School*, University of Washington, June 28–July 16.
7. *A Minisemester on Evolution of Interfaces*, Hokkaido University, Sapporo, Japan, July 12–August 13.
8. *10th Canadian Summer School on Quantum Information*, University of British Columbia, July 17–31.
9. *Summer School on Computer Models and Geophysical Risk Analysis*, University of British Columbia, August 6–10.
10. *West Coast Algebraic Topology Graduate Summer School*, University of Oregon, August 8-15.

- **Collaborative Research Groups**

1. *CRG 14 - Differential Geometry and Analysis*, 2007–2010.
2. *CRG 15 – Environmetrics*, 2007–2010.
3. *CRG 18 - Bayesian Modeling and Computation for Networks*, 2008–2010.
4. *CRG 19 - Partial Differential Equations*, 2008–2011.

5. *CRG 20 - Operator Algebras and Non-commutative Geometry*, 2009–2011.
6. *CRG 21 - Number Theory*, 2010–2012.
7. *CRG 22 - Mathematics of Quantum Information*, 2010–2012.

- **Lecture & Seminar Series**

1. *IAM-PIMS-MITACS Distinguished Colloquium Series*, University of British Columbia.
2. *PIMS Postdoctoral Colloquium Series*, University of British Columbia.
3. *2010 CRM-Fields-PIMS Prize Lecture*, University of British Columbia.
4. *The AMI Seminar Series*, University of Alberta.
5. *PIMS Distinguished Lecture Series*, University of Regina.
6. *Alberta Topology Seminars*, University of Calgary.
7. *Niven Lecture Series*, University of British Columbia.
8. *PIMS Distinguished Chair Lecture Series*, University of British Columbia / Simon Fraser University.
9. *PIMS/CSC Distinguished Lecture Series*, Simon Fraser University.
10. *Seminars on Analysis and Partial Differential Equations*, University of Calgary.
11. *Interdisciplinary seminar series on theoretical and applied mechanics*, University of Alberta.
12. *UW-PIMS Colloquium*, University of Washington.
13. *Seminars and Colloquia at the University of Victoria*.
14. *PIMS Distinguished Seminar Series in Bayesian Methodologies*, University of Regina.
15. *West End Number Theory Seminar*, University of Calgary.
16. *Applied Mathematics Seminar*, University of Saskatchewan.
17. *Seminar on Mathematical Modeling in Public Health*, University of Alberta.
18. *UBC-SFU Number Theory Seminar*.
19. *Quantum Information Seminar Series*, University of Calgary.

- **International Graduate Training Centre in Mathematical Biology**

1. *Mathematics for Biological Networks*, University of Victoria, May 10–June 2.
2. *IGTC Summit and Workshop 2010*, Naramata, BC, October 1–3.

- **Industrial Activities**

1. Monte Carlo Methods for Quantitative Finance, University of Calgary, February 17–18.
2. Industrial Week during the Summer School in Risk Management and Risk Sharing, University of British Columbia, June 7–July 9.
3. 45th Actuarial Research Conference, Simon Fraser University, July 25–28.
4. IMA-PIMS-CIMAT Graduate Industrial Mathematics Modeling Camp, Guanajuato, Mexico, August 2–11.
5. PIMS/Shell Lunchbox Lecture Series, Calgary.

- **Other**

1. *PIMS/UBC Information Session on Grant Opportunities*, Spring.
2. *PIMS Postdoc Day*, University of British Columbia, Fall.

D. CRG Status Reports

Currently PIMS has 6 active CRGs; below we briefly summarize current and upcoming activities and list their PDFs. In 2010 PIMS will inaugurate two CRGs, on *Number Theory* and *The Mathematics of Quantum Information*.

CRG 14: Geometric Analysis (2007-2010)

- **Leaders:** Jingyi Chen (UBC), Ailana Fraser (UBC).
- **2009 Activities:**
  1. Short term visitors/speakers at University of Washington: (09–10) Weiyong He, Albert Chau, Elton Hsu, (08–09) Xiaochun Rong, Bo Guan, Tobias Lamm.
  2. Short term visitors/speakers at University of British Columbia in 2009: E. Hsu, W. Minicozzi, F. Schulze.
  3. *Pacific Northwest Geometry Seminar*, University of British Columbia, May 2–3.
- **2010 Activities (Planned):** *PRIMA Conference on Geometric Analysis*, University of British Columbia, July 20–30.
- **PDFs:**
  1. Weiyong He (UBC).
  2. Tobias Lamm (UBC).
- **Graduate Student:** Chao Pang.

CRG 15: Environmetrics (2007-2010)

- **Leaders:** Jim Zidek (UBC), Charmaine Dean (SFU), Sylvia Esterby (UBC-Okanagan), Peter Guttorp (UW).
- **2009 Activities:**
  1. Workshop - *Effects of climate change: coastal systems, policy implications, and the role of statistics, and Intense Course – Statistical software for climate research*, March 16 -20, Sliema, Malta.
  2. The CRG has piloted the hosting of video-conferenced courses. Two courses on different aspects of spatial statistics, one with focus on air quality and one on agriculture, have been offered using video-conferencing tools. Synergy, The Journal of UBC Science published an article about the courses in the January 1, 2009 issue (*science.ubc.ca/sites/science.ubc.ca/files/synergy/synergy-2009-1.pdf*).
  3. Weekly research discussions on multi-cloud models for organized tropical convection, University of Victoria, Spring.

- **2010 Activities (Planned):** This CRG is winding down; one PDF will remain active in 2010.
- **PDFs:** Yiping Dou (UBC).
- **Graduate Students:**
  1. Reza Hosseini (UBC), PhD Thesis: Statistical models for agroclimate risk analysis. Soyean Kim (SFU), MSc. Thesis: Imputation based on local likelihood density estimation for interval censored survival data with application to tree mortality in British Columbia.
  2. Victoria Wan (SFU), MSc. Thesis: Smoke plume estimation from satellite images for smoke exposure studies in health.
  3. Wendell Challenger (SFU), MSc Thesis: Design of Monitoring Programs.

CRG 16: Climate Modeling (2007-2010)

- **Leaders:** Boualem Khouider (UV), Adam Monahan (UV).
- **2009 Activities:**
  1. Workshop on *Multiscale Processes in the Tropics*, BIRS, April 27–May 1.
  2. Weekly research discussions on multi-cloud models for organized tropical convection, University of Victoria, Spring.
- **2010 Activities (Planned):** *PIMS Distinguished Chair*, Summer. Dr. George Kiladis (a world leader in observational and theoretical studies of tropical wave dynamics) will visit the University of Victoria, for two to three weeks to interact with scientists there and at the Canadian Centre for Climate Modelling and Analysis.
- **PDFs:**
  1. Michael Waite (UV).
  2. Ian Ross (UV).

CRG 17: Complex Geophysical Fluid Dynamics (2007-2009)

- **Leaders:** Neil Balmforth (UBC), Mark Jellinek (UBC).
- **2009 Activities:** This CRG ended in 2008, but publications arising from it continue to appear. One PDF remained active in 2009.
- **PDFs:** Guillaume Carazzo (UBC).

CRG 18: Bayesian Modeling and Computation for Networks (2008–2011)

- **Leader:** Kevin Murphy (UBC).
- **2009 Activities:**
  1. NIPS workshop on *Adaptive Sensing, Active Learning and Experimental Design: Theory, Methods and Applications*, Whistler, BC, December 11.
  2. Visitor at UW: Prof. Sylvia Richardson (Imperial College, London).

- **2010 Activities (Planned):**
  1. *Modeling and Computation for Social Networks*, Whistler, BC, June 20–27.
  2. Visitors: Francesca Dominici and Giovanni Parmigiani (Biostatistics, Harvard), April.
- **Students:**
  1. Matt Dunham, undergraduate student in Computer Science, UBC.
  2. Cody Severinsk, undergraduate student in Computer Science, UBC.
  3. Vivien Wong, MSc in statistics, SFU.
  4. Saman Muthukumurana, PhD in statistics, SFU.
  5. Kenneth Lo, PhD in statistics, UBC.

CRG 19: Partial Differential Equations (2008–2011)

- **Leader:** Nassif Ghoussoub (UBC).
- **2009 Activities:**
  1. 8th Pacific Northwest PDE Conference, University of British Columbia, January 17.
  2. Workshop on "Theory and Applications of Classical and Quantum Kinetic Theory," BIRS, June 21-26.
  3. Workshop on "Topics in Kinetic Theory," University of Victoria, June 29-July 3.
  4. Workshop on "Asymptotic analysis in the calculus of variations and PDEs", University of British Columbia, July 6-10.
  5. Workshop on "Multiscale Analysis of Self Organization in Biology", BIRS, July 12-17.
  6. Workshop on "Analysis of nonlinear PDEs and free boundary problems: Applications to homogenization", University of British Columbia, July 20-24.
  7. Workshop on New Connections Between Differential and Random Turn Games, PDE's and Image Processing, University of British Columbia, July 27-31.
  8. Workshop on Regularity problems in hydrodynamics, UBC, August 3-7.
  9. Analysis of nonlinear wave equations and applications in engineering, BIRS, August 10-14.
  10. Workshop on Nonlinear dispersive and geometric evolution problems: singularities and asymptotics, University of British Columbia, August 17-21.
  11. Mini-symposium in PDE, University of British Columbia, November 12-13.
- **2010 Activities (Planned):** Three new PDFs will be selected during this period.
- **PDFs:**
  1. Yves Van Gennip (SFU).
  2. Mohammad El Smaily (UBC).

CRG 20: Operator Algebras and Non-commutative Geometry (2009–2011)

- **Leaders:** D. Farenick (UR), M. Laca (UV), A. Lau (UA), I. Putnam (UV).
- **2009 Activities:**
  1. 37th Canadian Operator Symposium, University of Regina, May 26-30.
  2. KMS States and Non-Commutative Geometry, University of Victoria, June 29-July 10.
  3. 2009 Northwest Functional Analysis Seminar, Banff, Alberta, October 16-18.
- **2010 Activities (Planned):**
  1. Workshop on Non-commutative Dynamics and Quantum Probability, University of Regina, May 10-15.
  2. Summer School on Operator Algebras and Non-commutative Geometry, University of Victoria, June 14-25.
  3. Conference on Selected Topics in Non-commutative Geometry, University of Victoria, June 27-July 2.
  4. Distinguished Chairs; William Arveson, Joachim Cuntz.
- **PDFs:** Bogden Nica (UV).

CRG 21: Number Theory (2010–2012)

- **Leaders:** M. Greenwood (UC).
- **2010 Activities (Planned):**
  1. West End Number Theory Seminar.
  2. UBC-SFU Number Theory Seminar.
  3. Distinguished Chair: Christopher Skinner (Princeton).
  4. Five visiting researchers.
  5. Alberta Number Theory Days.

CRG 22: The Mathematics of Quantum Information (2010–2012)

- **Leaders:** Barry Sanders (UC), Robert Raussendorf (UBC), Pter Lisonek (SFU), Dave Bacon (UW).
- **2010 Activities (Planned):**
  1. *Workshop on quantum algorithms, computational models, and foundations of quantum mechanics*, University of British Columbia, July 23–25.
  2. *10th Canadian Summer School on Quantum Information*, University of British Columbia, July 17–31.
  3. *Quantum Information Seminar Series*.

E. Thematic Programs Report

PIMS ran two Thematic Programs in 2009.

1. Partial Differential Equations

The core of this program was a series of nine consecutive week-long workshops, hosted by UBC, UV, and 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 program's ambitious scope reflected 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 centered 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. Miller (MPI), T. Riviere (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 thorough 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. This Thematic Program supported 2 PDFs: Mohammad El Smaily (UBC) and Yves Van Gennip (SFU).

2. Challenges and Perspectives 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-MIT-ACS Summer School in Probability*. The summer school was made up of two four-week graduate courses were 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 four postdoctoral fellows present for the entire academic year 2008-09 (three of whom stayed or are staying for a second year): Sreekalyani Bhamidi, Pierluigi Falco, Benjamin Graham, Robert Masson and Xing-Hua Zheng. 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, 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 feedback was received from participants. Highlights of the meeting were several talks on trapping models for Brownian motions and random walks, including an excellent 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.

F. IGTC in Mathematical Biology Report

This IGTC is designed to develop distributed training by building, in particular, on graduate programs in mathematical biology at UC, UBC and UA. The IGTC counts 25 faculties from SFU, UA, UBC, UBC-O, UC, UL, UV and UW, along with tens of visitors every year.

The key component of the IGTC is its Fellowships, which are awarded to graduate students at Canadian PIMS member or affiliate universities. There were 12 Fellows in 2008-2009 and 11 in 2009-2010. In addition the IGTC enrolled 3 non-fellowship students in 2008-2009 and 2 in 2009-2010. IGTC students were located at UA, UBC, UBC-O and UC. The current 2009-2010 IGTC Fellowship students and their research projects (when known) are: Jun Allard (UBC); Jaime Ashander (UA), *Evolutionary and ecological consequences of human perturbations to host-parasite communities*; William Carlquist (UBC); Jonathan Martin (UA), *Mathematical models for forest fire spread*; Jennifer Morrison (UBC); Vishaal Rajani (UA), *Mathematical Analysis of Biomolecule Movement*; Kelly Paton (UBC); Erin Prosk (UBC); Romain Richard (UC), *Daphnia life-history in dynamic predator-prey environments*; Shaun Strohm (UBC-O), *Dispersal of Mountain Pine Beetle in Banff and Impacts of Management*; and Marie Varughese (UA), *Dynamics of infectious disease*.

During 2009, the IGTC hosted two events: the *Third Graduate Research Summit and Workshop* held at UBC during July 24-July 26 with 40 attendees, and the two-week long summer school on *Models in Ecology*, held at the Bamfield Marine Science Centre, BC, during July 27-August 13 with 22 attendees. The latter focused on the methods, models and tools of quantitative ecology and was organized and taught by Mark A. Lewis (UA) and Martin Krkosek (UW).

In 2010 the *Fourth Graduate Research Summit and Workshop* will be held at Naramata, BC during October 1-3, and the IGTC summer school on *Mathematics for Biological Networks* will take place at UV, May 10–June 2.

Further information about the IGTC is at *pims.math.ca/scientific/igtc/mathematical-biology*.

G. Evaluation of PIMS Activities

This year PIMS began collecting evaluations of all its scientific events of at least three days duration. Participants were asked to fill in an online survey rating various aspects of their events. The results were passed on to the event organizers and were also scrutinized at PIMS Central. Below are charts summarizing responses to questions of particular interest to PIMS; here "1" represents the worst score (very dissatisfied/low/poor) and "5" the best score (very satisfied/high/excellent):

Figure 2

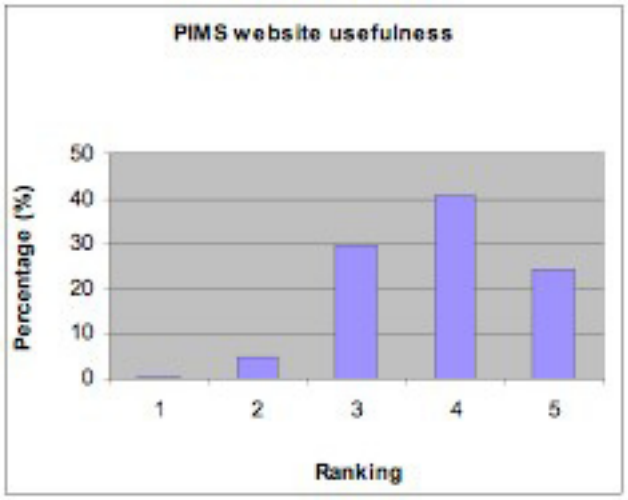


Figure 3

Figure 4

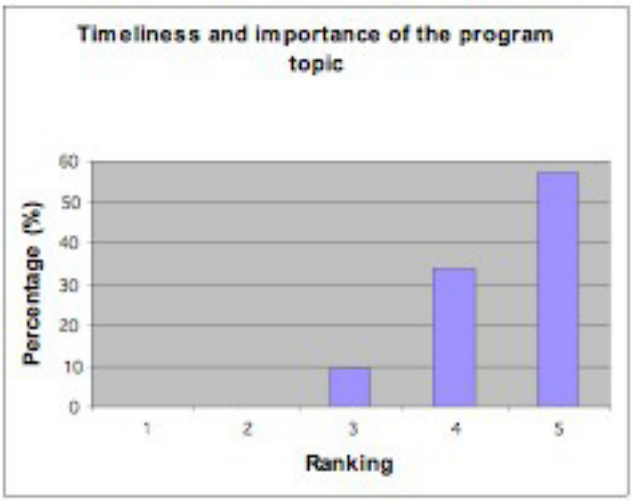


Figure 5

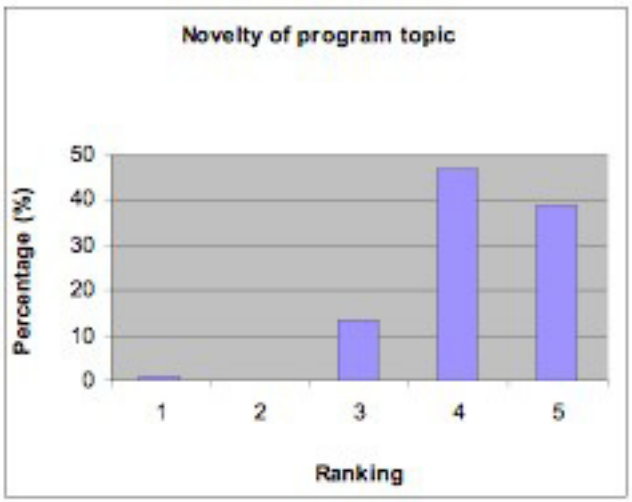


Figure 6

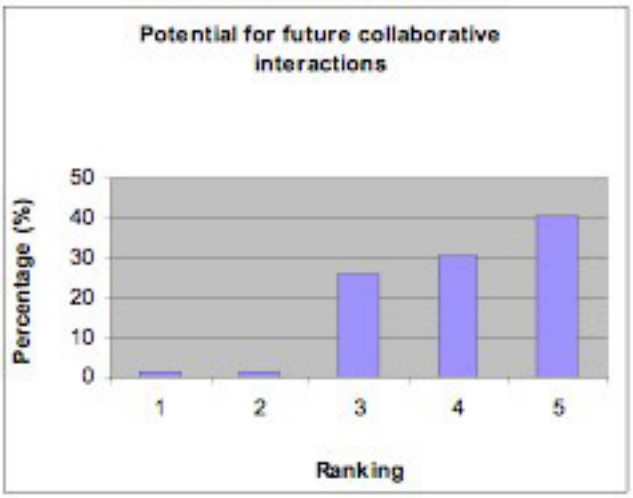


Figure 7

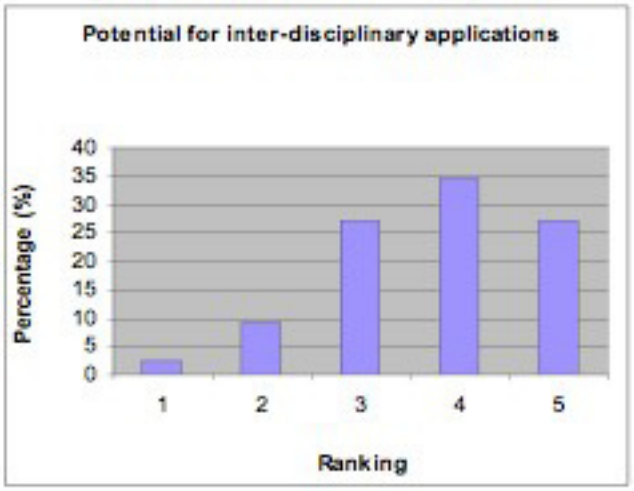


Figure 8

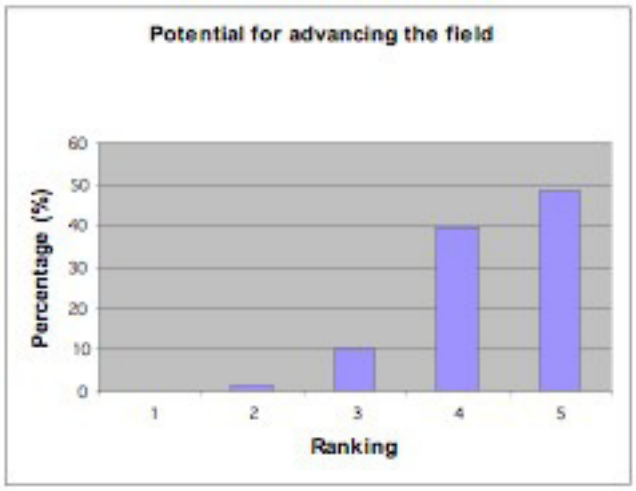


Figure 9

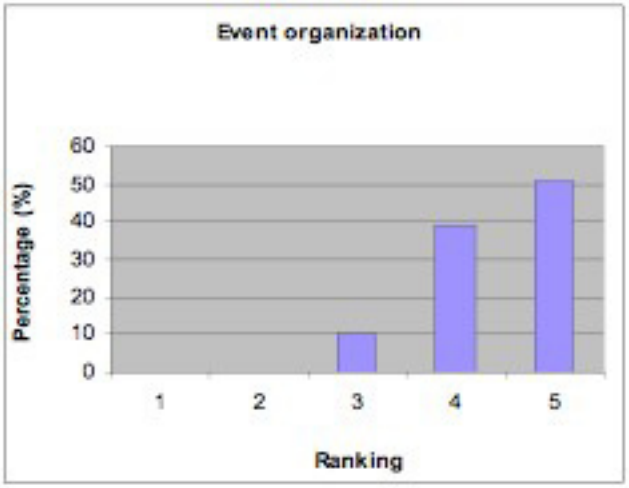


Figure 10

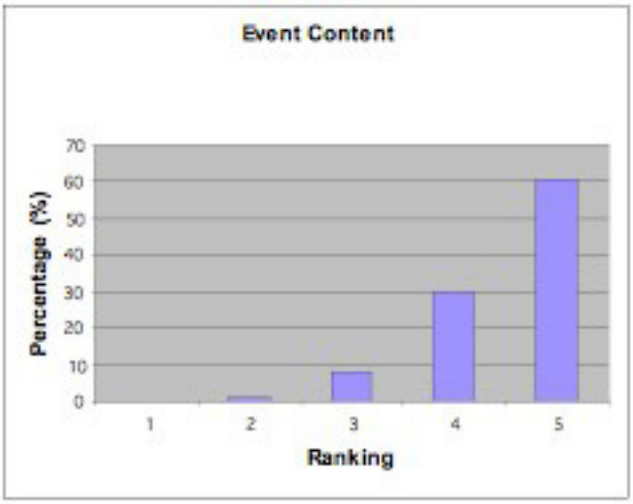
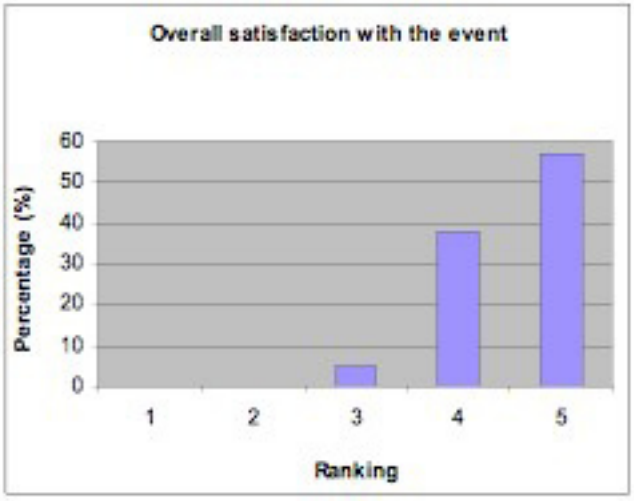


Figure 11



H. Demographics

Here we provide some demographics of participants in PIMS' scientific events and programs. For all conferences/workshops, summer schools, IGTC, industrial and "other" activities, we:

i. Summarize the total number of attendees and the number of attendee-days.
ii. Sort the attendees into academics, educators, industrial scientists, and others. We further sort academics into professors, postdoctoral fellows, graduate students, under graduate students and others.
iii. List the number of males/females.
iv. Classify the attendees as to whether they belong to Canadian institutions, other North American institutions, or institutions located elsewhere. As well, we break down the Canadian participants by province.

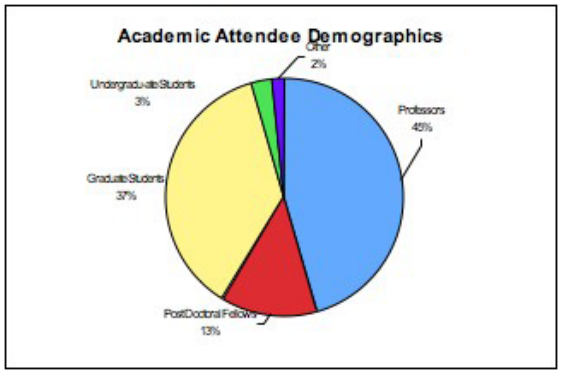
In what follows data from 2008 are placed in brackets.

During the 2009 [2008] reporting period, PIMS helped to support **58** [64] scientific activities of the types listed above. However, we have data on only 52 activities. Of these,

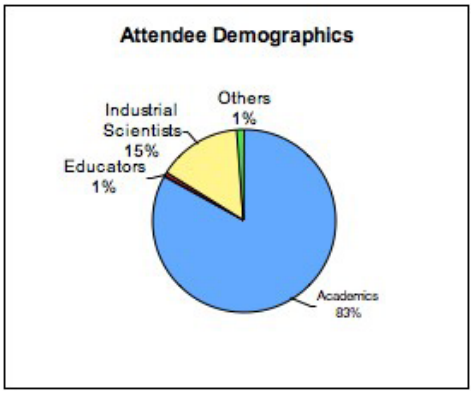
- The total number of attendees: **3,470** [3,775]
- Attendee-days spent at PIMS activities: **13,965** [19,265]
- Average attendees/activity: **67** [80]
- Average attendee-days/activity: **269** [410]
- Average activity duration: **4.2** [5.1] days

Of these attendees,

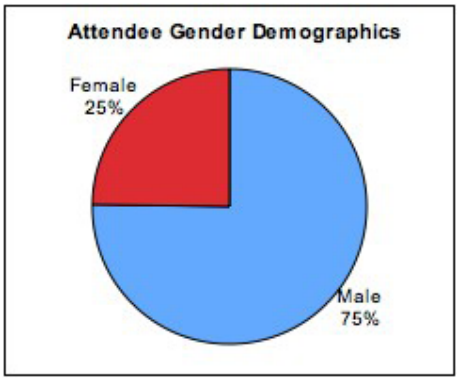
- 2,276 were identified as **academics** (83% [78%] of all identifiable attendees), and of these:
  - 45% [34%] were **professors**,
  - 13% [16%] were **PDFs**,
  - 37% [32%] were **graduate students**,
  - 3% [16%] were **undergraduate students**, and
  - 2% [1%] were **other academics**.



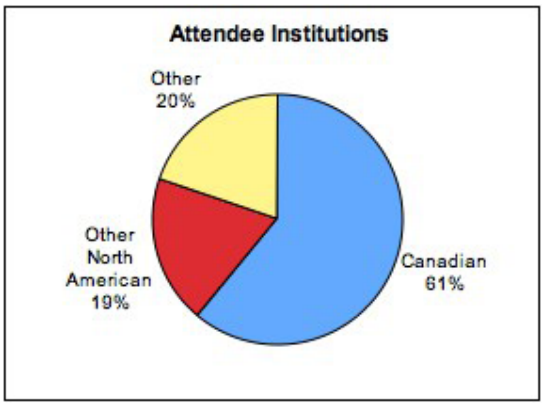
- 27 were identified as **educators** (1% [1%] of all identifiable attendees),
- 407 were identified as **industrial scientists** (15% [18%] of all identifiable attendees), and
- 22 were **others** (1% [3%] of all identifiable attendees).



Of those attendees who stated their gender,
- 75% [72%] were male, and
- 25% [28%] were female.



Also
- 1,798 identified themselves as being from **Canadian** institutions (61% [56%] of all identifiable attendees), of which
  - 38% [23%] were from British Columbia,
  - 21% [58%] were from Alberta,
  - 3% [3%] were from Saskatchewan,
  - 3% [3%] were from Manitoba,
  - 24% [9%] were from Ontario,
  - 7% [3%] were from Quebec,
  - < 4% [< 1%] were from elsewhere in Canada.
- 560 were from **other North American** institutions (19% [28%] of all identifiable attendees), and
- 578 from **elsewhere** (20% [16%] of all identifiable attendees).



We have also computed the geographical distribution of PIMS events and programs, including Lecture & Seminar Series, during 2009. Of 77 activities with well-defined geographic loci during that period,
- 67 were held in **Canada** (87%), of which:
  - 40 were held in British Columbia (60%),
  - 18 were held in Alberta (27%),
  - 4 were held in Saskatchewan (6%),
  - 3 were held in Quebec (4%),
  - 1 was held in Ontario (1%),
  - 1 was held in Newfoundland (1%).
- 6 were held in the **United States** (8%): 2 in Oregon and 4 in Washington.
- 4 were held overseas (5%): 1 in Australia, 1 in Japan and 2 in Malta.

Of course, some programs such as CRGs are spread over several provinces and states.

I. Selected Publications

Below we list selected publications from PIMS' CRG activities, PDFs and CNRS Researchers. Only publications appearing (or accepted for publication) in 2009 are listed.

1. Agyemang, Ibrahim & Freedman, H. I. A mathematical model of an agricultural industrial-ecospheric system with industrial competition. Commun. *Pure Appl. Anal.* 8 (2009), no. 5, 1689--1707.
2. Agyemang, Ibrahim & Freedman, H. I. An environmental model for the interactions of industry with two competing agricultural resources. *Math. Comput. Modelling* 49 (2009), no. 7-8, 1618--1643.
3. Ainsworth, L.M. & Dean, C.B. (2009). Zero-inflated Spatial models. Under revision for *Environmental and Ecological Statistics*.
4. Akbar, M. M. & E. Woolgar. Ricci Solitons and Einstein-Scalar Field Theory. *Class. Quant. Grav.* 8. 26:055015, 2009.
5. Akbar, M. M. Generalized Second Law of Thermodynamics in Extended Theories of Gravity. *Int. Journal of Theoretical Physics*. 48:2665-2671, 2009.
6. Ancey, N., N. Balmforth & I. Frigard (2009). Viscoplastic fluids: from theory to application. *Journal of Non-Newton. Fluid Mech.*, v. 158, 1-3.
7. Ansong, J. & B. Sutherland (2009). Internal gravity waves generated by convective plumes. *Journal of Fluid Mechanics*, in press.
8. Argerami, Martín; Farenick, Douglas; Massey, Pedro. The gap between local multiplier algebras of C^*-algebras. *Q. J. Math.* 60 (2009), no. 3, 273--281.
9. B. Allison, S. Berman, J. Faulkner. & A. Pianzola. Multiloop realization of extended affine Lie algebras and Lie tori. *Trans. Amer. Math. Soc.* 4807--4842 (2009).
10. Baghbanzadeh & S. Rezakhani, A. T. Temperature effects on quantum cloning of states and entanglement. *Phys. Lett.* A 373, 821 (2009).
11. Bahturin, Yu; Tvalavadze, M.; Tvalavadze, T. Group gradings on superinvolution simple superalgebras. *Linear Algebra Appl.* 431 (2009), no. 5-7, 1054--1069.
12. Bailey, Robert. Error-correcting codes from permutation groups, *Discrete Mathematics*, 2009.
13. Bailey, Robert. Hamiltonian decompositions of complete k-uniform hypergraphs, to appear in *Discrete Mathematics*, 2009.
14. Balmforth, N. & C. Cawthorn (2009). First Contact in a viscous fluid I: a descending wedge. *Journal of Fluid Mechanics*, in press.
15. Balmforth, N., C. Cawthorn & R. Craster (2009). First Contact in a viscous fluid II: a compressible fluid and an elastic solid. *Journal of Fluid Mechanics*, in press.
16. Balmforth, N. & T. Peacok. Tidal conversion by super-critical topography. *Journal of Physical Oceanography*, v. 39, 2009.
17. Bates, L., Cushman, R., Hamilton, M. & Sniatycki, J. Quantization of singular reduction. *Rev. Math. Phys.* 21 (2009), no. 3, 315--371.
18. Baumgartner, Udo; Laca, Marcelo; Ramagge, Jacqui; Willis, George. Hecke algebras from groups acting on trees and HNN extensions. *J. Algebra* 321 (2009), no.11, 3065--3088.
19. Bezdek, K. & A.E Litavak. Covering convex bodies by cylinders and lattice points by flats", *J. of Geometric Analysis*, 19 (2009). 233--243.
20. Bonner, Simon. Continuous, time-varying covariates in mark-recapture-recovery analyses: A comparison of methods. *Biometrics*, 2009.
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2. PIMS Postdoctoral Fellows & CNRS/PIMS Scientists

PIMS has created a large number of postdoctoral opportunities for young researchers in the mathematical sciences. The regular PIMS Postdoctoral Fellow (PDF) competition takes place each January. Postdoctoral candidates from institutions in France are eligible for CNRS/PIMS fellowships. In addition, there are several PIMS-supported PDFs that are associated with Collaborative Research Groups and/or Thematic Programs; these go through the same rigorous review process. Candidates must be nominated by a scientist or group of scientists affiliated with PIMS. The two year Fellowships are tenable at any of the member or affiliated universities.

In 2008 PIMS had 54 PDFs on its rolls, and 45 in 2009. Below we list all PDFs supported by PIMS in 2009 and their university affiliations:

Babak, Petro (UA)
Bailey, Robert (UR)
Bhamidi, Sreekalyani (UBC)
Bonner, Simon (UBC)
Carazzo, Guillaume (UBC)
Chang, Stewart (UBC)
Chapuy, Guillaume (SFU)
Cruttwell, Geoffrey (UC)
Dou, Yiping (UBC)
El Smaily, Mohammad (UBC)
Falco, Pierluiigi (UBC)
Fortescue, Benjamin (UC)
Fusy, Eric (UBC)
Gabizon, Ariel (SFU)
Graham, Benjamin (UBC)
Hafshejani, Arash (SFU)
He, Weiyong (UBC)
Kang, Su Jeong (UA)
Karabash, Illia (UC)
Kirsch, Stephane (UBC)
Kunduri, Hari (UA)
Lamm, Tobias (UBC)
Masson, Robert (UBC)
Naszodi, Marton (UA)
Nica, Bogdan UV)
Petrov, Victor (UA)
Rajendran, Prakash (UA)
Redmond, Brian (UC)
Ross, Ian (UV)
Roy, Aidan (UC)
Sauerwald, Thomas (SFU)
Schoenhuth, Alexander (SFU)
Seon, Thomas (UBC)
Sinha, Kaneenika (UA)
Stange, Katherine (SFU)
Suh, Chan-Ho (UV)
Tvalavadze, Marina (US)
Tvalavadze, Teymuraz (UA)
Van Gennip, Yves (SFU)
Waite, Mike (UV)
Yang, Dilian (UC)
Yoneda, Tsuyoshi (UV)
Yuncken, Robert (UV)
Zhang, Dali (UC)
Zheng, Xing-Hua (UBC)

PIMS' PDFS are closely mentored by sponsoring faculty at PIMS' host institutions. In the case of CRG and Thematic Program PDFS, they are inducted into appropriate research groups. PIMS Central also monitors PDF progress, and follows up on PDFs after their tenure has ended. All PDFs are given exit interviews which we use to assess and improve our programs. Our PDFs move on professionally to a range of positions and activities at top places, including: U. Paul Cézanne (Aix-Marseille, France), Champlain College (QC), UW, Hong Kong U. of Science and Technology (China), US, U. do Algarve (Faro, Portugal), U. Waterloo, U. de Chile (Santiago, Chile), U. Massachusetts (Boston), Brno U. of Technology (Czech Republic), U. Manitoba, U. Blaise Pascal de Clermont-Ferrand (France), U. Ottawa, McMaster U., Rice U., Laboratoire de Probabilité et Modèles Aléatoires (Paris, France), Columbia U., INRIA Bordeaux Sud Ouest (France), Princeton U., École normale Supérieure (Paris, France), U. California (Berkeley), Univerzita Karlova v Praze (Prague, Czech Republic), Laboratoire Écologie et Sciences Phytosanitaires (Renne, France), Victoria U. (Wellington, NZ), UA, U. Warsaw (Poland), LIX École Polytechnique, (Palaiseau, France), U. London (UK), U. N. Carolina (Chapel Hill), Joseph Fourier (Grenoble, France), Munich American Reassurance Company (WA), Institute for Advanced Study, UBC, Max Planck Institute for Mathematics (Bonn, Germany), U. Oregon and Moscow State U. (Russia).

At UBC, the PIMS Assistant Director is responsible for ensuring that the PIMS PDFS are looked after intellectually, professionally and socially. A PIMS Postdoctoral Colloquium Series runs monthly, in which PDFs hone speaking skills for professional presentations as well as job interviews. All PIMS/UBC PDFs are encouraged to participate and present talks. This series is also useful as a vehicle for PDFs to interact with other PDFs, learn about each others' research and share ideas. Central also holds one-day workshops twice a year on professional development topics such as Information Session on Grant Opportunities and Postdoc/Grad Student Job Forum. The Assistant Director also hosts various social activities so as to reduce postdoc isolation and promote formation of long-term friendships and contacts.

PIMS also hosts more senior researchers from France as part of its cooperative agreement with the CNRS. In 2009, the following scientists took part in this program:

Allali, Julien (SFU, U. Bordeaux)
de Roton , Anne (UBC, U. Nancy 1)
Ferraro, Pascal (UC, U. Bordeaux)
Ille, Pierre (UC, CNRS Luminy)
Imbert, Laurent (UC, U. Montpellier)
Kallel, Sadok (UBC, U. Lille)
Meersseman, Laurent (UBC, U. Bourgogne)
Munnier, Alexandre (UBC, U. Nancy 1)
Oyono-Oyono, Herve (UV, U. Pascal)
Payan, Yohan (UBC, U. Joseph Fourier)

In addition to PDFs and PIMS/CNRS scientists, PIMS sites host a large number of long- and short-term visitors: over 100 in 2009 alone.

3. Educational

A. K-12 Educational Activities:

PIMS is dedicated to increasing public awareness of the importance of mathematics in the world around us. We want young people to see that mathematics is a subject that opens doors to more than just careers in science. Many different and exciting fields in industry are eager to recruit people that are well prepared in this subject. From its inception, PIMS has supported a series of educational initiatives for the K-12 level, including:

- Organization of interesting, fun and challenging math events for children of all ages.
- Facilitation of access to information (newsletters, workshops, conferences, special publications, etc.) about math education matters to parents, teachers and university faculty.
- Coordination of workshops to create links of communication between parents, teachers, mathematicians and math educators.
- Publishing Pi in the Sky, a math magazine for high school students.
- Holding workshops to improve teachers' math and teaching skills.
- Hosting the annual Changing the Culture conferences for school teachers.

1. General

- **Math Mania:** This is a popular alternative math education event that has been presented in elementary and (more recently) middle schools of greater Victoria and the Lower Mainland since 1997. All age levels are welcome, although it is particularly suited to students in grades 4-7. *Math Mania* presents a variety of interactive demonstrations, puzzles, games and art. These activities are designed to demonstrate to students – and their parents – fun ways of learning both math and computer science concepts. On average over two hundred students, parents and teachers participate in *Math Mania* events. This year 11 *Math Manias* were held in Surrey, Chilliwack, Tsawwassen, Brentwood Bay, Vancouver, Victoria, and Surrey. Further details are available at *pims.math.ca/education/math-mania*.

- **SNAP Math Fairs:** PIMS sponsors these non-traditional **S**tudent-centered, **N**on-competitive, **A**ll-inclusive, and **P**roblem-based math fairs based in Alberta. The purpose of a SNAP math fair is to provide a meaningful problem-solving experience for all students. Two SNAP fairs were held in Banff in April and June. Visit *mathfair.com* for more information.

- **Changing the Culture:** This is a yearly one-day meeting organized and sponsored by PIMS, bringing together mathematicians, mathematics educators and school teachers from all levels to work together towards improving the teaching of mathematics. It is held at SFU Harbour Centre in downtown Vancouver every April, and includes lectures, roundtables and discussion on mathematical topics, the teaching of mathematics and its connections to society. This event attracts about 100 participants.

- **ELMACON:** The **El**ementary **Ma**thematics **Con**test is a yearly event held at UBC open to students in Grades 5 to 7 from Lower Mainland schools which gives them the chance to experience mathematics as an exciting sport. This PIMS-sponsored event attracts close to 300 participants, and was held this year on May 9.

- **UBC/PIMS Math Workshops:** These workshops in Lower Mainland schools aim to excite Grade 6-12 students about mathematics by exposing them to interesting and challenging problems and interesting math people. In the case of Grade 12 students, careers and university programs in the mathematical sciences are also discussed. The workshops are conducted by faculty and student volunteers from the UBC Mathematics Department, and are coordinated by the PIMS-BC Education Coordinator. Over 80 workshops are conducted each year, all over the Vancouver metropolitan area.

- **Teacher Workshops:** These workshops are designed to help elementary school teachers build their math skills for the classroom. This year 5 workshops were help in the Vancouver area.

- **Pi in the Sky:** The widely distributed (estimated circulation is 9,000) semi-annual high school level periodical produced by PIMS for students in Canada and the United States, aims to establish direct contact with teachers and students, to involve high school students in mathematical activities, as well as to promote careers in mathematical sciences. For current and back issues go to *pims.math.ca/resources/publications/pi-sky*.

- **PIMS Education Prize:** Every year PIMS awards an education prize to outstanding mathematical educators in Alberta, British Columbia or Washington State. A cash award is attached to the prize, which has considerable prestige, and receives widespread publicity in the mathematical community and beyond. See *pims.math.ca/pims-glance/prizes-awards* for details about the 2009 prizewinner.

- **Lesson Studies for Teachers:** Lesson Study is a form of professional development in which teachers jointly plan, implement, observe, analyze, and refine actual classroom lessons called “research lessons”, and then revise and report on the results so that other teachers can benefit. For the last two years PIMS has been offering series of workshops closely modelled on the highly successful Lesson Studies conducted by the Galileo Educational Network of Calgary.

• In addition, PIMS supports the **Math Circles Coaching Program,** the **Vancouver Free Math Mentorship Program** and the **No Homework Club**, along with other local initiatives.

2. Aboriginal/First Nations

Under the auspices of the First Nations Education Steering Committee (FNESC), PIMS has developed a partnership with First Nations schools in BC. Activities under this pilot program include:

• **Teacher training/math development sessions** during the summer, where mathematicians and educators provide lessons for teachers to help them assimilate teaching material for their mathematics courses. Sessions have been held in Kamloops, Lytton, Barriere, Port Alberni, Vernon and Merritt. Partner schools in the interior of British Columbia include: Sk'elep School of Excellence in Kamloops, Lelawagila Primary School at Kingcome Inlet, Stein Valley Nlakapamux School at Lytton, Neqweyqwelsten School at Barriere, Bonaparte School North of Lytton, First Nations Elementary and Secondary schools at Bella Bella, First Nations Elementary School in Port Alberni (Vancouver Island), Lower Nicola Band School in Merritt and the Xit'olacw Community School in Mount Currie.

• A **coordinated mentorship program** where undergraduate students from universities work with local teachers and students to provide support in mathematics.

• **Assistance in choosing and implementing mathematics curricula** at First Nations Schools, where the PIMS BC Education Coordinator serves as a permanent resource for teachers and administrators.

• **Providing in-depth assessment** of the mathematical skills for students at our partner schools, measuring the impact of their programs and suggesting adjustments along the way.

• PIMS has organized **math summer camps** at Kamloops, Lytton, Merritt and Mount Currie for the last 3 years. More than 150 children have attended these camps.

• **School partnerships:** During the last three years, PIMS has developed a partnership with the Britannia School in Vancouver, which has a large number of aboriginal students. For the last three summers PIMS organized a math summer camp for a group of these students: a transitional summer camp for students transitioning from seven to eight grade and a senior summer camp for aboriginal students attending Britannia high school. Together with the mathematics department at UBC we have been coordinating mentorship programs at Britannia Secondary. PIMS is also coordinating a scholarship program to support the neediest of their aboriginal students. We are currently developing similar partnerships with Templeton Secondary, Windermere Secondary, Point Grey Secondary and MacDonald Elementary Schools. This program is funded by the federal government (approximately $140K for 2009-10) as well as private donors.

• **Math Clubs:** In March 2007 PIMS together with UBC organized a math club at the Musqueam Reserve. In January 2008 we expanded this program which now includes a math mentorship program and a math club that meets at the Vancouver Aboriginal Friendship Center; this program is led by faculty and students at SFU.

• The **First Nations Math Education Workshop** co-sponsored by PIMS was held in Banff this November. The main goal was to find ways to move forward in promoting mathematical opportunities for aboriginals.

B. Post-Secondary Educational Activities

Colleges and universities wishing to enjoy an affiliation with PIMS (but not otherwise eligible for regular PIMS membership) may engage as PIMS Education Associates. Membership is for a period of three years and is renewable. An annual membership fee of $500 is paid by the college or university. Members are entitled to apply for PIMS funding to engage in appropriate education, outreach, and professional development activities in their region. Examples of approved activities are the support of a guest speaker on the Large Hadron Collider, support for a regional math competition and for the purchase of mathematical models and demonstration materials for the use in the classroom in both colleges and local secondary schools. To date 5 colleges in BC and 4 in Alberta have become PIMS Education Associates: Camosun College (BC), Vancouver Island University (BC), Okanagan College (BC), **University of the Fraser Valley (BC)**, **Langara College (BC)**, Red Deer College (AB), Concordia College (AB), Grant McEwan College (AB), and **Mount Royal College (AB)**. (The institutions in boldface joined PIMS this year). We hope to sign up several more Education Associates in 2010.

PIMS also held the Alberta Colleges Mathematics Conference at Red Deer College, AB during May 1–2. As well, PIMS and the CMS sponsored the Canadian Mathematics Education Forum in Vancouver, April 30 to May 3, 2009, at the SFU Harbour Centre campus.

MECHANISMS OF ACCESS TO PIMS

PIMS has developed several means of alerting current and potential users to its activities, including: the PIMS website, various publications, annual reports, conference proceedings, global advertizing, video streaming and video conferencing.

1. Website

The PIMS website (*pims.math.ca*), which is currently being re-organized and redesigned, divides the work at PIMS into three major categories: Scientific, Educational and Industrial. The website offers easy global access to information on all PIMS' activities, press releases and resources.

2. Popular Publications

- **PIMS Magazine** is produced twice yearly. In connecting the PIMS community, the magazine contains: announcements of upcoming scientific, industrial and educational events; reports on the recent activities at PIMS; accolades and breakthroughs within the PIMS community; and upcoming opportunities and how to apply. The latest issue can be found at *pims.math.ca/resources/publications/pims-magazine*.

- **Pi in the Sky** is primarily aimed at high-school students and teachers, with the main goal of providing a cultural landscape for mathematics. It has a natural extension to junior high school students and undergraduates, with articles that put curriculum topics in a different context. *Pi in the Sky* accepts materials on any subject related to mathematics and its applications, including: articles, problems, cartoons, statements, jokes, etc. Pi in the Sky is mailed to various institutes and private subscriptions throughout Canada and the world, (estimated circulation is 9,000) and can be downloaded through the new PIMS website: *pims.math.ca/resources/publications/pi-sky*.

3. Advertising

PIMS-funded events are advertised both electronically and in print. We advertise through websites and publications at institutions such as MITACS, the Institute of Mathematical Statistics, the Canadian Mathematical Society, SIAM and the American Mathematical Society, and by offering custom-designed posters that are distributed to over 200 of the top scientific institutions world-wide.

4. Annual Reports

PIMS produces an annual report that is sent to sponsors, administrators at PIMS-affiliated universities, representatives from the business, industry and resource sectors as well as the major professional societies. Past annual reports (1997-2008) can be viewed at *pims.math.ca/resources/publications/annual-report*.

5. Conference Proceedings and Reports

Conference proceedings, abstracts, lecture notes, websites and final event reports are all made available for download from the PIMS website in .pdf or .html format. (See *pims.math.ca*). Conference materials are attached to the corresponding event, which are listed chronologically and are searchable by keyword for ease of access.

6. Audio/Video Facilities

PIMS-funded event coordinators are offered a wide range of audio-visual services to facilitate the global nature of collaborative scientific work. Our current video-conferencing facilities are undergoing modernization as part of the WestGrid initiative that will allow us to increase their flexibility and offer full, high-definition service to our users. These improvements will allow us to tighten the integration between PIMS sites as well as fostering the development of distance learning courses and remote collaborations. We aim to build upon recent successful remote events such as an ongoing seminar series in Number Theory hosted jointly between UBC, SFU and UC, and a distance education course in Markov Decision Processes that is part of the NSERC CREATE program and includes remote students in Vancouver, Edmonton and Montreal. Two PIMS-sponsored statistics graduate courses utilized these facilities this summer, with live broadcasts between UBC, SFU and UW.

PIMS also maintains a growing catalog of over 200 multimedia recordings of our events that help us in engaging people in mathematical education and development (see *pims.math.ca/resources/multimedia*). We are currently investigating a number of different avenues for dissemination of these media including online video services and podcasting services such as Apple's iTunes U.

ACTIVITIES TO KEEP ABREAST OF SCIENTIFIC ADVANCES

The Scientific Review Panel (SRP) is responsible for the scientific leadership at PIMS. Through their continuing efforts, PIMS keeps abreast of activities in the mathematical community and seeks to develop programs in new areas. The process that the SRP follows can be briefly described as follows:

1. identify research topics,

2. discuss at length the value, impact and feasibility of running scientific activities in these areas at the annual SRP meeting and through email discussion,

3. serve as liaisons between experts in a particular area and the PIMS Director and Deputy Director thus providing crucial scientific expertise,

4. once an important theme has been identified, the SRP will work with potential organizers to develop a proposal that encompasses the required depth and breadth to ensure a high quality event of international caliber.

Aside from the role played by the SRP, the PIMS Directors regularly attend research conferences and meetings of professional societies (such as the American Mathematical Society, the Canadian Mathematical Society and CAIMS), and consult with leading experts to obtain/solicit information on recent advances in the mathematical sciences. This also involves establishing regular channels of communication with the PIMS community and encouraging researchers to use PIMS as a platform for development of their ideas. In addition, through a systematic scanning of web based literature (such as preprints on the arXiv) and announcements of scientific breakthroughs in bulletin boards and journals, PIMS maintains a pro-active involvement in learning about and enhancing the impact of new developments.

PIMS MRS NSERC Activity Report January 1 to December 31 2009

	Use of the resource (i.e. PIMS) Paid from all revenue sources January 1 to December 31 2009	Planned use of MRS funds January 1 to March 31 2010	Planned use of MRS funds April 1 2010 - March 31 2011
Resource Expenditures			
1) Salaries & Benefits			
a) Students (includes IGTC, CRG & other students)	202,701	28,900.00	193,461.00
b) Postdoctoral Fellows	552,966	67,000.00	405,150.00
c) Technical/Professional Assistants (inc. Education)	83,233	0.00	0.00
d) Administrative Staff (includes Directors)	546,135	0.00	0.00
e) Scientific Support Personnel	157,569	35,930.00	172,089.00
2) Equipment or Facility			
a) Purchase or Rental	39,629	0.00	0.00
b) Operation and Maintenance Costs	72,155	0.00	0.00
3) Materials & Supplies			
a) Furniture	550	0.00	0.00
b) Meals/Refreshments	10,920	0.00	0.00
c) Office Supplies	32,435	0.00	0.00
4) Travel - by PIMS Staff			
a) PIMS Meetings (SRP, PDF, Board, Admin, Exec)	41,088	0.00	0.00
b) Grad Student and PDF Travel Support	13,025	0.00	0.00
c) Director Scientific Collaboration/Consultation	32,405	0.00	0.00
5) Dissemination Costs			
a) Publication Costs	1,938	0.00	0.00
b) Other activities	7,525	0.00	0.00
6) Other - Scientific Activities			
a) CRGs	323,555	0.00	100,000.00
b) IGTC	31,709	0.00	41,300.00
c) Conferences/Symposia	232,451	0.00	31,000.00
d) Summer Schools	101,569	0.00	60,000.00
e) Workshops/Seminars/Colloquia (inc. IPSW)	124,746	4,000.00	52,000.00
f) Distinguished Visitors/Chairs/Speakers	33,673	3,000.00	25,000.00
g) Education Initiatives	246,833	0.00	0.00
h) NICDS	22,812	0.00	0.00
i) Support for BIRS	89,926	0.00	0.00
j) CNRS/UNAM/PRIMA Visitors	42,486	0.00	20,000.00
k) Thematic Programs	67,337	0.00	0.00
l) Other Support	56,724	45,000.00	0.00
TOTAL EXPENDITURES	**3,168,094**	**183,830.00**	**1,100,000.00**

Resource Revenues ***(collected during the period January 1 to December 31 2009)***

a)	User Fees (Registration Fees collected)	163,400
b)	Contributions from Partner Universities	
	UBC	293,751
	Simon Fraser University	80,000
	University of Alberta	77,700
	University of Calgary	67,710
	University of Victoria	66,000
	University of Saskatchewan	50,000
	University of Regina	35,000
	University of Washington	13,215
	University of Lethbridge	5,550
	Portland State University	4,567
c)	Contributions from MITACS	
	PDE Thematic Summer	55,000
	Math Finance Summer School	27,943
	IPSW-GIMMC	27,333
	Probability Summer School	22,500
	CMS-SMM Meeting	5,000
	AMGSC 2009	1,000
d)	Private Donations	36,266
e)	Contributions from Industry	
f)	Other Contributions	
	British Columbia Govt. - Ministry of Advanced Education	127,805
	UAS - Federal Interlocutor for Metis & Non-Status Indians	112,095
	CRM re Summer School in Probability	35,000
	BC NCE Infrastructure Grant	32,164
	Reimbursement of travel expenses	26,877
	U. of Regina Math Dept re post-doc salary	20,000
	AMSI re Similarity Conference	8,000
	Other miscellaneous	6,364
	Education Associates	6,000
	Fields Institute re CMS-SMM Meeting	5,000
	CRM re CMS-SMM Meetin	5,000
	Fields Institute re CMEF 2009	4,000
	U. of Alberta Math Dept re Algebra Summer School	3,000
	UBC Math Dept re CMS-SMM Meeting	2,500
	SIAM & OUP re Society for Math Bio Meeting	1,825
	UBC Math Dept re Brydes-Feldman Symposium	1,500
	UBC Math Dept re educational materials	500
	UBC Math Dept	496
g)	AAET Grant	180,008
h)	NSERC Grant	1,100,000
i)	Carried Forward from December 31 2008	957,439
TOTAL REVENUES (January 1 to December 31 2009)		**3,667,508**

Appendix: Glossary of Acronyms

PIMS	Pacific Institute for the Mathematical Sciences
AMS	American Mathematical Society
AARMS	Atlantic Association of Research in the Mathematical Sciences
BIRS	Banff International Research Station
CAIMS	Canadian Applied and Industrial Mathematics Society
CRM	Centre de Recherches Mathématiques
CNRS	Centre National de la Recherche Scientifique
CMS	Canadian Mathematical Society
CRG	Collaborative Research Groups
GIMMC	Graduate Industrial Mathematics Modeling Camps
ICIAM	International Council for Industrial and Applied Mathematics
IMA	Institute for Mathematics and its Applications
IPSW	Industrial Problem Solving Workshop
IGTC	International Graduate Training Centre in Mathematical Biology
MSRI	Mathematical Sciences Research Institute
MITACS	Mathematics of Information Technology and Complex Systems
PRIMA	Pacific Rim Mathematical Association
PDF	Postdoctoral Fellows
PSU	Portland State University
SAMSI	Statistical and Applied Mathematical Sciences Institute
SFU	Simon Fraser University
SMB	Society for Mathematical Biology
SSC	Statistical Society of Canada
UA	University of Alberta
UBC	University of British Columbia
UBC-O	University of British Columbia–Okanagan
UC	University of Calgary
UL	University of Lethbridge
UR	University of Regina
US	University of Saskatchewan
UV	University of Victoria
UW	University of Washington