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- The Natural Sciences and Engineering Research Council of Canada
- The British Columbia Information, Science and Technology Agency
- The Alberta Science and Research Authority
- Simon Fraser University, The University of Alberta, The University of British Columbia, The University of Calgary, The University of Victoria.

PIMS Sponsored Education Event Wins National Award

The Canadian Teachers Federation has awarded a 1998 Roy C. Hill National Teaching Award to *Mathematics Unplugged*, an annual student mathematics conference sponsored by PIMS and held at Westwood Elementary School in Coquitlam, British Columbia. On March 17, the award will be presented to Pamela Hagen of Westwood Elementary, organizer of the conference for the past two years. See *Award*, page 12.

Alberta Science and Research Authority Awards \$800K to PIMS

On December 21, the Alberta Science and Research Authority (ASRA) announced it is awarding \$800K to PIMS programs. This reaffirms the support that the Government of Alberta has shown for PIMS and for the Mathematical Sciences in Western Canada. The support of ASRA for PIMS is consistent with their new drive to support the development of information-based technologies in Alberta.

UBC and SFU Provide Research Facilities for PIMS and MITACS

Through the support of Barry McBride (VP Academic and Provost, UBC), the PIMS Central Office has been provided with a 4,800 sq. ft. office facility on the UBC campus. This will allow us to accommodate up to 30 PIMS scientists and visitors. We are looking forward to occupying our new offices on June 1. In addition, PIMS will continue to utilize the scientific computing lab and reading room that have been provided courtesy of Frieda Granot (Dean of Graduate Studies, UBC).

At SFU, we have also recently acquired expanded facilities. Through the support of David Gagan (VP Academic and Provost, SFU), SFU has provided the PIMS SFU site office with 2,500 sq. ft. of office space. This will allow up to 15 visiting scientists to be accommodated.

MITACS Board Approves 21 Projects

The MITACS (Mathematics of Information Technology and Complex Systems) Network Agreement became official on February 22. The MITACS network represents a collaboration involving 174 researchers from 22 universities, 3 institutes, 34 companies, plus other organizations. For more information on MITACS, please visit the mitacs web site at www.mitacs.math.ca. See *MITACS News*, page 3.

Director's Notes

Nassif Ghousoub, FRSC

Soon PIMS will begin its first year of full funding. We are excited about the many projects that we have planned for this year.

Starting in June will be the first of several workshops that comprise our Thematic Summer on Mathematical Biology. This thematic programme consists of five workshops on mathematical aspects in Genomics, Physiology, Epidemiology, Ecology and Cellular Biology. We are pleased to see that a considerable number of graduate students and postdoctoral fellows are taking advantage of the thematic nature of these workshops by registering to attend two or more of these workshops. Indeed, many participants will be attending all five of the workshops.

For some of our activities this summer, we will try an experimental format that places the focus on having fewer formal lectures and more opportunities for active collaborative work between the participants. This model will be followed by the *Mini-programme in Geometric Functional Analysis* (UBC, June 27 – July 18), the *Workshop on Smoothing Applications* (UBC, June 23–25), the *Workshop on Invariants of Three Manifolds* (UC, July 16–22), and the *Workshop on Particles, Fields, and strings* (UBC, August 2–20).

This year, the level of interest in PIMS Scientific Postdoctoral Fellowships was high, with 54 nominations received. We plan to award up to 20 fellowships and the PIMS PDF Review Committee is currently engaged in the challenging task of ranking the candidates.

Setting up MITACS has been a gruelling exercise on many levels. However, we are finally ready to roll. The approximately 80 project scientists in British Columbia and Alberta are eager to get started.

We are grateful to Barry McBride (VP Academic and Provost, UBC) and David Gagan (VP Academic and Provost, SFU) for their assistance in obtaining expanded research facilities at UBC and SFU. Without these facilities, it would have been difficult for us to carry out the many activities that we have planned for the upcoming year.

Call for Registration

PIMS 3rd Industrial Problem Solving Workshop

May 31 – June 4, 1999

PIMS will host the third annual Industrial Problem Solving Workshop on the campus of the University of Victoria from May 31 to June 4. The workshop will follow the previously implemented format: On the first day six industrial problems will be presented by the industrial scientists. Participants will then divide into teams to spend the next four days and nights working intensively on the problems. At the end of the week presentations will be

made by the teams. Each team will write a paper detailing their findings; these papers will be bound and widely distributed by PIMS.

This event is an excellent opportunity for companies to access academic resources and to take advantage of the expertise of PIMS mathematical scientists. It will also provide a worthwhile experience for university faculty, postdocs, and graduate students who are interested in new challenges. Almost all the participants of our previous workshops find the experience rewarding and the time well spent. For graduate students, PIMS will organize a training one week prior to the workshop on the campus of University of Alberta.

Limited financial support for travel and local expenses is available from PIMS.

Call for Applications

PIMS 2nd Graduate Industrial Mathematics Modelling Camp May 24–28, 1999

The second PIMS Graduate Industrial Mathematics Modelling Camp will be held on the campus of the University of Alberta, May 24–28, 1999.

The goal of the Mathematical Modelling Workshop is to provide experience in the use of mathematical modeling as a problem solving tool for graduate students in mathematics, applied mathematics, statistics and computer science. This year, we have invited all the mentors from local industry or government services. They will pose problems directly relevant to their organizations.

Limited financial support for travel and local expenses are available from PIMS. More information, including an on-line application form, can be obtained at PIMS website (<http://www.pims.math.ca>).

The problems to be considered are:

1. *Geo-Statistical Modelling of Geological Media*, Stefan Bachu, Alberta Geological Survey
2. *Error Measurer for Uncertainties in Drill-bore Position*, Ian Gilles, Sperry-Sun
3. *Modelling of a Novel Scheme for Telecommunications Network Synchronization*, Wayne Grover, Telecommunications Research Laboratories (TRLabs)
4. *Modelling the Deformation and Fracturing of Oil-Sands under Pressure*, Mike Lipsett, Syncrude
5. *Modelling Missing and Perturbed Half-Tone Dot Images (Pint Quality)*, Gordon Leery, Pulp and Paper Research Centre
6. *Modelling of Ship-to-Plane and Plane-to-Ship Tracking Based on Radar Data*, Elisa Shabazian, Lockheed Martin Canada

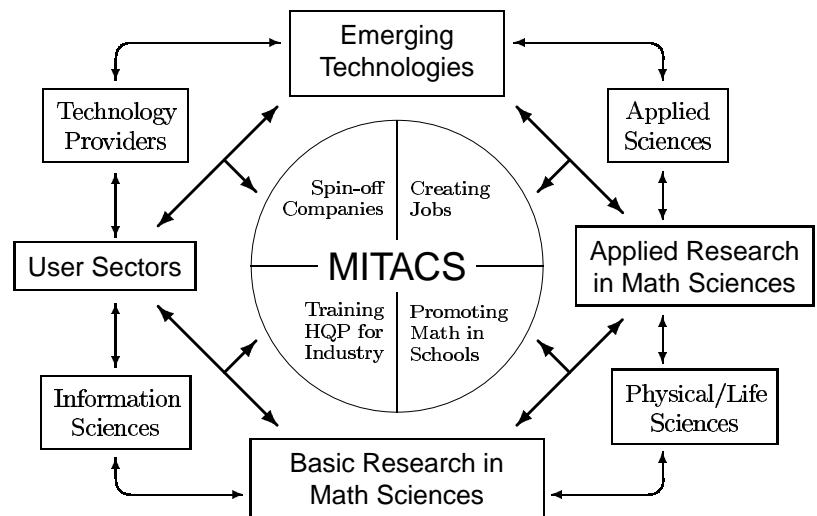
More information, including an on-line registration form, is available at www.math.uvic.ca/new_events/ips3.html.

MITACS Board Approves Projects

The MITACS NCE consists of 21 projects organized into 5 themes: Mathematics of the Trading and Finance Sector, Mathematics of The BioMedical Sector, Mathematics of the Information Technology Sector, Mathematics of the Commercial Industrial Sector, and Mathematics of the Manufacturing Sector. Of the 21 MITACS projects, 9 are affiliated with PIMS.

MITACS presents numerous opportunities for young mathematical scientists interested in working on industrial problems. Please see the PIMS and MITACS web pages for a list of such opportunities.

MITACS Mathematics-Industry Networking Model



PIMS Affiliated MITACS Projects

1. Symbolic Analysis

Project members: P. Borwein (Project leader, SFU), J. Borwein, M. Monagan, Loki Jorgenson (SFU), K. Geddes (Waterloo), D. Boyd (UBC), R. Corless, D. Jeffrey, J. Stafford, S. Watt (UWO), C. Laflamme (UA), K. Taylor (Saskatchewan), F. Bergeron (UQAM), S. Devitt (Maple Inc.)

Industrial partners: Maple Inc., Matlab Inc., SUN Canada, Neologos, IBM Canada, Math Resources

2. Large Scale Probabilistic Mathematical Models for Complex Industrial Systems

Project members: M. Puterman (Project Leader, UBC), D. Atkins, C. Boutilier, H. Chen, D. Lawson, T. McCormick, M. Queyranne (UBC), J. Bookbinder (Waterloo), M. Gendreau (Montreal), J. McGill (Queen's)

Industrial partners: BC Telephone, Canadian Airlines, Avcorp Industries, Workers Compensation Board of BC, BC Gas

3. Prediction for Interacting Stochastic Systems

Project members: M. Kouritzin (Project Leader, UA), J. Bowman, K. Fleischmann, E. Gombay, N. Prasad, B. Schmuland, S. Shen, Y. Shu Wong (UA), E. Perkins, P. Greenwood (UBC), B. Kapron (UVic), D. Dawson (Fields), B. Remillard (UQTR), S. Feng (McMaster), A. Heunis (Waterloo), A. Jouan, E. Shahbazian, B. Leiminger, R. Mahler, C. Poling (Lockheed-Martin)

Industrial partners: Lockheed-Martin

4. Modeling, Trading and Risk in the Market

Project members: U. Haussmann (Project Leader, UBC), M. Barlow, N. Ghoussoub, C. Gui, J. Liu, A. Peirce, E. Perkins, J. Walsh (UBC), A. Lari-Lavassani (UC project leader), L. Bates, G. Sick (UC), D. Bruce (BC Hydro), S. Hatch (TransAlta), M. Margolis, M. Buchko (Powerex), D. Glassco, L. Luo, D. Ng, O. Walsh (Financial CAD)

Industrial partners: Powerex, BC Hydro, FinancialCAD, TransAlta

5. Mathematical methods for modeling, verification and testing in information technology

Project members: B. Kapron (Project leader, UVic), M. Cheng (UVic), J. Delgrande (SFU), M. Kouritzin (UA), P. Panangaden (McGill), B. Older (NORTEL)

Industrial partners: NORTEL

6. Mathematical Modeling and Scientific Computation

Project members: B. Wetton (Project leader, UBC), A. Peirce, B. Seymour, M. Ward (UBC), R. Choksi, M. Kropinski, K. Promislow, B. Russell (SFU), H. Huang (PIMS Industrial facilitator), R. Westbrook (UC)

Industrial partners: Powertech Lab, BC Hydro, Ballard Power Systems

7. Mathematics of Resource Allocation and Scheduling

Project members: P. Hell (Project leader, SFU), B. Alspach, L. Goddyn, A. Gupta, L. Hafer, R. Krishnamurti (SFU), W. Cunningham (Waterloo), W. Pulleyblank (IBM), M. Queyranne (UBC), J. M. Bourjolly (Concordia)

Industrial partners: IBM Canada, IBM T.J. Watson, Finning Inc., Amber Computer Inc.

8. Biomedical Models of Cellular and Physiological Systems in Disease

Project members: L. Keshet (Project leader, UBC), Y. Li, R. Miura J. Piret, D. Schwarz, C. Shaw (UBC), G. Vries (Alberta), D. Finegood (SFU)

Industrial partners: Precision Biochemicals, Covalent Associates, Incomputro Neurosciences, Therexcell, Bayer and SmithKline Beecham, StemCell Technologies

9. Facility Location Problems

Project members: B. Bhattacharya (Project Leader, SFU), T. Shermer (SFU), J. M. Keil (Saskatchewan), D. Kirkpatrick, J. Snoeyink (UBC), G. Toussaint (McGill), P. Bose (Carleton)

Industrial partners: Digital Dispatch Systems, Metafact Tech.

Fields-PIMS Thematic Year 1999–2000

Graph Theory and Combinatorial Optimization

From August 1999 to August 2000, the **Pacific Institute for the Mathematical Sciences** and the **Fields Institute** will be sponsoring a joint programme in graph theory and combinatorial optimization. Preceding this thematic programme, PIMS is also sponsoring a pre-thematic year workshop on Computational Graph Theory and Combinatorics at The University of Victoria on May 6–8, 1999. The lead-off event for the joint thematic year is the Workshop on Algorithms and Data Structures (WADS), to be held at SFU Harbour Centre on August 11–14, 1999. Following WADS, the Canadian Conference on Computational Geometry (CCCG) will take place at UBC on August 15–18. The thematic programme continues with six workshops to be held at the **Fields Institute** from September 1999 to May 2000. During the Summer of 2000, the thematic programme will return to PIMS, with eight workshops planned for June and August. Further information and registration is available on the PIMS webpage under www.pims.math.ca/sections/activities.

Lead-off Events, Summer 1999

<p>Workshop on Computational Graph Theory and Combinatorics May 6–8, 1999 University of Victoria</p> <p>Invited Speakers: B. McKay (Australian National Univ.), Steve Skiena (SUNY Stony Brook), Herbert S. Wilf (Univ. of Pennsylvania)</p> <p>Organizers: Wendy Myrvold and Frank Ruskey (UVic)</p> <p>The programme of this workshop will consist of invited lectures and contributed half hour talks on a variety of topics in computational graph theory or computational combinatorics.</p>	<p>Workshop on Algorithms and Data Structures August 11–14, 1999 Harbour Centre, SFU</p> <p>Invited Speakers: C. Leiserson (MIT), M. Snir (IBM), N. Thalmann (Geneva), J. Vitter (Duke), U. Vazirani (UC Berkeley)</p> <p>Organizers: Arvind Gupta and Binay Bhattacharya (SFU)</p> <p>WADS is a forum for original research in design and analysis of algorithms & data structures. It features papers on the theory and application of algorithms & data structures to all areas, including combinatorics, computational geometry, databases, graphics, parallel/distributed computing, and cryptography.</p>	<p>11th Canadian Conference on Computational Geometry August 15–18, 1999 University of British Columbia</p> <p>Invited Speakers: John Canny (UC Berkeley), Susanne Fortier (Queen's, to be confirmed), Victor Klee (Univ. of Washington)</p> <p>Organizers: Jack Snoeyink and David Kirkpatrick (UBC)</p> <p>This conference focuses on the mathematics of discrete geometry from a computational point of view. CCCG traditionally attracts a large number of students because of its workshop atmosphere and because conference costs are kept low by using accommodation in dorms and student volunteers.</p>
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Full Programme for 1999–2000

Fields Institute

Sept. 26 – Oct. 1, 1999

Approximation Algorithms for Hard Problems in Combinatorial Optimization

Nov. 1–6, 1999

Polyhedral and Semidefinite Programming Methods in Combinatorial Optimization

Dec. 6–11, 1999

Matroids, Matching and Extensions

Jan. 17–22, 2000

Graph Minors and Topological Graph Theory

Feb. 14–18, 2000

Probabilistic Graph Theory

May 18–13, 2000

Structured Families of Graphs

PIMS

May 6–8, 1999

Workshop on Computational Graph Theory and Combinatorics

Aug. 11–14, 1999

Workshop on Algorithms and Data Structures

Aug. 15–18, 1999

Canadian Conference on Computational Geometry

Summer 2000 Events

Interconnection Networks, N. Pippenger, UBC

Dynamic Graph Problems, V. King, UVic

Computational Geometry and Geographic Information Systems, Jack Snoeyink, UBC

Partial k-Trees, Arvind Gupta, SFU

Graph Colouring, Pavol Hell, SFU

Graph Decompositions, Brian Alspach, SFU

Flows, Colourings and Orientations, L. Goddyn, SFU

PIMS Mini-programme in Geometric Functional Analysis

June 27 – July 18, 1999

PIMS, University of British Columbia

Geometric Functional Analysis is concerned with geometric and linear properties of finite- and infinite-dimensional convex bodies. The general framework and deep geometric, probabilistic and combinatorial methods developed here are used in many areas outside the field, including Analysis, Geometry and many others.

Over recent years, Geometric Functional Analysis has noted several significant accomplishments. There have been two Fields Medals (J. Bourgain in 1994 and T. Gowers in 1998), the Plenary Address at the European Congress of Mathematics by V. Milman (1996), and two Plenary Addresses at the International Congress of Mathematicians by G. Pisier and M. Talagrand (1998). Also, four invited lectures at the last two Congresses (Gowers, Odell-Schlumprecht, Milman, Tomczak-Jaegermann) demonstrated the spectrum of achievements from geometric purely infinite dimensional phenomena to high dimensional phenomena.

Organized by Nicole Tomczak-Jaegermann (Univ. of Alberta) and Vitali Milman (Tel Aviv), this mini-programme will bring together top researchers in the field to exchange new ideas and present their recent results. Young researchers, postdocs and advanced Ph.D. students are encouraged to participate. An emphasis will be placed on encouraging interactions between young researchers and senior mathematicians attending the meeting.

Invited Participants Include

Dan Amir, Tel Aviv University
George Androulakis, Texas A & M University
Spiros Argyros, University of Athens
Wojciech Banaszczyk, University of Lodz
Franck Barthe, Université de Marne-la-Vallée
Sergey G. Bobkov, Syktyvkar University
Jean Bourgain, IAS
Apostolos A. Giannopoulos, University of Crete
Efim D. Gluskin, Tel Aviv University
Yehoram Gordon, Technion
W. Timothy Gowers, Cambridge University
Mikhael Gromov, IHES
Olivier Guédon, Paris VI
Petr Hajek, Texas A & M University
William B. Johnson, Texas A & M University
Nigel Kalton, University of Missouri
Hermann Koenig, Universität Kiel
Alex Koldobsky, University of Texas at San Antonio
Rafal Latała, Georgia Institute of Technology
Joram Lindenstrauss, Hebrew University
Alexander Litvak, Univ of Alberta
Piotr Mankiewicz, Polish Academy of Sciences
Mathieu Meyer, Université de Marne-la-Vallée
Edward Odell, University of Texas at Austin
Krzysztof Oleszkiewicz, Warsaw University
Alain Pajor, Université de Marne-la-Vallée
Aleksander Pełczyński, Polish Academy of Sciences
Gilles Pisier, Université Paris VI

Shlomo Reisner, Haifa University
Haskell P. Rosenthal, University of Texas at Austin
Mark Rudelson, University of Missouri
Gideon Schechtman, Weizmann Institute of Sciences
Carsten Schuett, Universität Kiel
Thomas Schlumprecht, Texas A & M University
Stanislaw Szarek, Université Paris VI
Michel Talagrand, The Ohio State University
Tony Tsolomitis, University of Crete
Elisabeth Werner, Case Western Reserve University

In addition, a number of graduate students and post-doctoral fellows have also been invited to participate. For further information and registration, please visit www.pims.math.ca/sections/activities/gfa99.html.

Report on Second PIMS Graduate Weekend

Coordinated by Gordon Swaters (Department of Math. Sciences, University of Alberta), the 1999 PIMS Graduate Weekend was held at the campuses of the University of Calgary and the University of Alberta on January 19–24, 1999. Students from across Canada were flown into Calgary on the 19th, where they attended a number of information sessions and met with University of Calgary faculty members on the following day. They had the opportunity to listen to four different sessions describing various research opportunities in the mathematical and statistical sciences. On the 21st, they were bused to Edmonton to visit the University of Alberta, where they attended another 12 sessions describing research opportunities in Algebra, Geometry & Topology, Classical & Functional Analysis, ODEs & PDEs, Fluid Dynamics, Computational Sciences, Statistics and Mathematical Biology, Finance, and Physics. In addition to the University of Alberta and University of Calgary speakers, there were presentations by representatives from Simon Fraser University and the University of British Columbia.

Social activities included a welcoming reception held at their hotel on the evening of the students' arrival in Edmonton. A luncheon was also provided the following day for all of the attendees, as well as the current graduate students in the Department of Math. Sciences, University of Alberta. The attendees very much enjoyed the chance to speak on an informal basis with a group of current graduate students. The attendees also were treated to a formal banquet at the University of Alberta Faculty Club, which was attended by Dean R. Peter, Faculty of Science, University of Alberta.

The 1999 Graduate Weekend was a success, with a number of students expressing genuinely interest in doing graduate studies at the PIMS Universities.

PIMS Thematic Programme, Summer 1999

Mathematical Biology

The upcoming Thematic Programme in Mathematical Biology consists of five workshops to be held at the University of British Columbia from June to August, 1999. Each workshop, which will be approximately two weeks long, will be organized around lecture series given by eminent researchers. The organising committee of the thematic programme consists of the organisers for each of the individual workshops. Robert M. Miura (University of British Columbia) is chairman of the joint organising committee. For additional information and registration, please visit www.pims.math.ca/sections/activities/bio.html.

Mathematical Genomics, May 31 – June 11

Organisers: David Sankoff (Université de Montréal) and Michael Waterman (Univ. of Southern California)

This workshop will bring together mathematical researchers from a variety of disciplines, such as molecular biology, evolutionary biology, discrete mathematics, and statistics, to examine mathematical problems of current interest within genomics. This is an exciting time in genomics with the current success at generating huge amounts of basic data. The analysis of this data poses many mathematical problems which will be addressed during the workshop.

Principal Speakers

Nadia El-Mabrouk, Université de Montréal
Joe Felsenstein, University of Washington
Terry Gaasterland, The Rockefeller University
Philip P. Green, University of Washington
Tom Hagedorn, The College of New Jersey
Steven Henikoff, F. Hutchinson Cancer Research Ctr.

Susan Holmes, Stanford University
Leroy Hood, University of Washington
Richard M. Karp, University of Washington
John Kececioglu, University of Georgia
Gary D. Stormo, University of Colorado at Boulder
Elisabeth Tillier, University of Toronto

Mathematical Physiology, June 14–24

Organisers: Yue-Xian Li (University of British Columbia), Robert M. Miura (University of British Columbia) and Gerda de Vries (University of Alberta)

This workshop is divided into three main topics: neurophysiology, cardiology and endocrinology. Mathematical modelling, mathematical analysis and computational methods are used extensively in each of these fields. The lectures will present a picture of the past, the present and the future of mathematical research in physiology.

Principal Speakers

Richard Bertram, Penn. State University, Erie
Bard Ermentrout, University of Pittsburgh
Diane Finegood, Simon Fraser University
Leon Glass, McGill University
James P. Keener, University of Utah
Joel Keizer, University of California at Davis

Yue-Xian Li, University of British Columbia
Robert M. Miura, University of British Columbia
Mark Pernarowski, Montana State University
Arthur Sherman, NIDDK/MRB
John Rinzel, Courant Institute of Math. Sciences
Gerda de Vries, University of Alberta

Mathematical Epidemiology, July 19–30

Organisers: Pauline van den Driessche (University of Victoria) and Fred Brauer (University of Wisconsin and University of British Columbia)

Mathematical epidemiology is concerned with modeling the spread of infectious disease in a population. The focus will be on general models for disease transmission and on models for specific diseases, including rapidly increasing diseases (HIV/AIDS, Lyme disease), re-emerging diseases (tuberculosis, Dengue fever), vector diseases (malaria, Chagas' disease), and the classical “childhood” diseases (measles, rubella, pertussis).

Principal Speakers

Linda Allen, Texas Tech. University
Sally Blower, Univ. of California at San Francisco
Carlos Castillo-Chavez, Cornell University

Herbert Hethcote, University of Iowa
Karl Hadeler, Universität Tübingen
Denis Mollison, Heriot-Watt University

Mathematical Ecology, August 2–13

Organiser: Marc Mangel (University of California at Santa Cruz)

Ecology is the study of the distribution and abundance of organisms. This workshop will focus on mathematical analysis applied to three main areas: individual behaviour, single population dynamics, multi-species population dynamics and community ecology.

Principal Speakers

Fred Adler, University of Utah
Colin Clark, University of British Columbia
Michael Doebeli, University of British Columbia
Greg Dwyer, University of Chicago
Steve Ellner, North Carolina State University

Shea Gardner, Imperial College at Silwood Park
Don Ludwig, University of British Columbia
Bernard Luttbeg, Yale University
Marc Mangel, Univ. of California at Santa Cruz
Jonathan Newman, University of Oxford

Mathematical Cell Biology, August 16–27

Organiser: Leah Keshet (University of British Columbia)

The lectures in this workshop will aim at understanding the behaviour of processes at the level of the cell using mathematical, computational, as well as experimental research. Topics will include receptor kinetics and intracellular signal transduction pathways, and cytoskeletal dynamics. These important and fascinating processes together determine the response of cells to signals, the motility and shape of the cell, and the process of cell division (cytokinesis).

Principal Speakers

Dean Bottino, University of Utah
Micah Dembo, Boston University
Victoria Foe, University of Washington
Byron Goldstein, Los Alamos National Laboratory

Alex Mogilner, Univ. of California at Davis
Gary Odell, University of Washington
Lee Segel, Weizmann Institute
Carla Wofsy, University of New Mexico

Householder Symposium XIV

June 14–18, 1999

Chateau Whistler, Whistler, B.C., Canada

PIMS is pleased to be one of the sponsors of the 14th Householder Symposium on Numerical Linear Algebra. The local organizing committee is chaired by Jim Varah (UBC). Other sponsors of this year's Householder Symposium are The Math Works, Inc., The University of British Columbia, The University of Waterloo and The Boeing Company.

This meeting is the latest in a series, previously called the Gatlinburg Symposia. The name honors Alston S. Householder, one of the pioneers in numerical linear algebra and organizer of the first four meetings. The format of the meeting is informal, with each attendee given the opportunity to present a talk. For more information see roadmap.ubc.ca/hholder.

First Canadian Conference on Nonlinear Solid Mechanics

June 16–20, 1999

University of Victoria

Intended to attract engineers, applied mathematicians, physicists, chemists, software experts, and industrial practitioners, this conference provides an international forum for communicating recent and projected advances in various areas of Nonlinear Solid Mechanics by assembling researchers working on common themes from complementary perspectives.

Invited Speakers

A. J. M. Spencer, University of Nottingham, UK
R. W. Ogden, University of Glasgow, Scotland
T. Belytschko, Northwestern University, USA
M. Hayes, University College Dublin, Ireland
M. S. Gadala, University of British Columbia

Organizing Committee

E. M. Croitoro, University of Victoria (Chair)
B. Tabarrok, University of Victoria
J. B. Haddow, University of Victoria
D. J. Leeming, University of Victoria
M. S. Gadala, University of British Columbia
G. A. C. Graham, Simon Fraser University
M. Epstein, University of Calgary
P. Schiavone, University of Alberta
T. Bryant Moodie, University of Alberta
Y. C. Chen, University of Houston
D. J. Steigmann, University of California, Berkeley

Visit www.CanCNSM.uvic.ca/main.html for further information.

PIMS Workshop on Smoothing Applications

June 23–25, 1999

University of British Columbia

The emphasis of the workshop is on the applications of smoothing methods to data. Several sessions will be centred around discussion of specific datasets, which will be

available beforehand on the workshop web site. The participants are expected to take a look at the data sets before the workshop. In addition, there will be other sessions consisting of more traditional-style presentations.

Invited Participants to Date

Nancy Heckman, UBC (organizer)
Kiros Berhane, University of Southern California
Charmaine Dean, Simon Fraser University
Irene Gijbels, Catholic University of Louvain
Hans Muller, University of California, Davis
Jim Ramsay, McGill University
John Rice, University of California, Berkeley
For more information see www.stat.ubc.ca/smoothing.

PIMS Workshop on Invariants of Three Manifolds

July 16–22, 1999

Nakoda Lodge, Morley, Alberta

Organized by John Bryden and Peter Zvengrowski from the Department of Mathematics and Statistics at the University of Calgary, this workshop is devoted to the invariants of three manifolds and topological quantum field theory. There will be invited lectures in the mornings on the state of research problems in the field, followed by discussion groups and informal seminars in the afternoon. For more information, please visit the workshop webpage under the *Scientific Activities* section of the PIMS webpage.

Invited Speakers

D. Auckly, Kansas State University
L. Crane, Kansas State University
F. Deloup, Université Paul Sabatier
C. Hayat-Legendre, Université Paul Sabatier
R. Kirby, University of California at Berkeley
R. Lawrence, University of Michigan
T. Le, SUNY at Buffalo
L. Rozansky, Yale University
A. Tralle, Max Planck Institut für Mathematik, Bonn
V. Turaev, Strasbourg
O. Viro, Uppsala Universitet
H. Zieschang, Ruhr Universität Bochum

International Symposium on Symbolic and Algebraic Computation

July 28–31, 1999

Harbour Centre, SFU

The International Symposium on Symbolic and Algebraic Computation (ISSAC) is a yearly international symposium that provides an opportunity to learn of new developments and to present original research results in symbolic mathematical computation. Topics covered at the meeting include algorithmic mathematics, computer science, and applications to engineering, economics and finance, physical and biological sciences, computer science, logic, mathematics, statistics, and use in education.

Organizing Committee Chairs

Keith Geddes, University of Waterloo (General Chair)
Bruno Salvy, INRIA Rocquencourt (Programme Chair)
Michael Monagan, SFU (Local Arrangements)
For further information, see www.cecm.sfu.ca/ISSAC99.

PIMS Summer School in Fluid Dynamics

August 7–20, 1999

University of Alberta

Organized by Bruce R. Sutherland and T. Bryant Moodie (Department of Mathematical Sciences, University of Alberta) this summer school offers an enriched learning environment in which the theoretical, experimental and computational aspects of fluid dynamics are synthesized. Participants will attend a comprehensive series of lectures, and will be given hands-on experience performing and analyzing experiments in the Environmental and Industrial Fluid Dynamics Laboratory. In addition, they will run numerical simulations using research-level codes. Topics will include fluid dynamics fundamentals, industrial and environmental flows, geophysical fluid dynamics, turbulence modelling and computational fluid dynamics.

Invited Speakers

G. Lawrence, University of British Columbia
P. Morrison, University of Texas at Austin
W. R. Peltier, University of Toronto

Core Lecturers

A. B. G. Bush, Earth & Atmos. Sciences, UA
J. C. Bowman, Math Sciences, UA
P. D. Mineev, Math Sciences, UA
T. B. Moodie, Math Sciences, UA
B. R. Sutherland, Math Sciences, UA
G. E. Swaters, Math Sciences, UA

See taylor.math.ualberta.ca/~bruce/events/fdss for further information.

10th International Workshop and Conference in Stochastic Geometry, Stereology and Image Analysis

August 24–28, 1999

University of Calgary

This meeting is aimed at active research workers in the fields of Stereology, Stochastic Geometry and Image Analysis. This includes Statisticians, Mathematicians, Pathologists, Material Scientists and Computational Experts. Graduate students are encouraged to attend and participate in the workshop. The workshop will make use of the Stereology Resource Centre at the University of Calgary, which was formed in 1996 primarily to meet the practical needs of biomedical researchers who need to make unbiased estimates of biological structure.

Organizers

Ernest Enns, Math. & Stat., University of Calgary
Peter Ehlers, Math. & Stat., University of Calgary
John Matyas, Anatomy, University of Calgary

The PIMS Scientific Postdoctoral Fellowship Awards for 1999–2000 will be announced by **March 15**.

International Workshop on Analysis of Vibrating Systems

September 26–28, 1999

Cranmore, Alberta

This intensive 3-day workshop will focus on the discussion of recent advances in the analysis of vibrations and identification of developing problem areas in the field. Topics to be considered include control, stability, sound and vibration, inverse problems, perturbation theory, nonlinear systems, Hamiltonian systems, gyroscopic systems and the role of operator theory.

The workshop will be held at The Greenwood Inn in Canmore, Alberta. Canmore is a resort town in the picturesque Rocky Mountains at the eastern boundary of Banff National Park. The town is 104 km west of Calgary, Alberta.

Invited Speakers

V. M. Adamjam, Odessa State University
S.J. Chern, National Tsing-Hua University, Taiwan
Graham Gladwell, University of Waterloo
Israel Gohberg, University of Tel Aviv
Peter Hagedorn, University of Darmstadt
Naomi Leonard, Princeton University
Alexander Lifschitz, Bankers Trust, New York
on leave from University of Illinois
Joyce McLaughlin, Rensselaer Poly. Inst.
Sri Namachchivaya, University of Illinois
Jim Woodhouse, Cambridge University

Programme Committee

Graham Gladwell, University of Waterloo
Keith Glover, Cambridge University
Peter Lancaster, University of Calgary (chair)
Heinz Langer, Tech. University of Vienna
Jerrold Marsden, Caltech
Jonathan Wickert, Carnegie Mellon

See www.math.ucalgary.ca/pims/vibrations for further information and registration.

PIMS Electronic Publications

PIMS publishes preprints, newsletters and conference reports electronically on its web server. The publications are available as postscript files, and in some cases, in pdf format.

PIMS Postdoctoral Fellows are strongly encouraged to submit their preprints electronic for publication on the PIMS preprint page. Submissions are also accepted from any mathematical scientists involved in PIMS activities. Submissions should be sent in latex or tex format to the PIMS Scientific Coordinator, Sandy Rutherford (email: sandy@math.ubc.ca).

The PIMS Electronic Publications webpage is at www.pims.math.ca/publications.



The 27th Canadian Operator Theory and Operator Algebras Symposium

May 20–24, 1999

University of Prince Edward Island

In conjunction with the **Fields Institute**, the **Centre de Recherches Mathématiques** and the **Atlantic Association for Research in the Mathematical Sciences**, **PIMS** is once again sponsoring the Canadian Operator Theory and Operator Algebras Symposium (COSY). Last year's symposium, held at the University of Alberta was a big success, and we look forward to another successful symposium. The organizer of COSY '99 is Gordon MacDonald of the University of Prince Edward Island.

Invited Speakers

Ken Davidson, University of Waterloo
George Elliott, University of Toronto
Liming Ge, University of New Hampshire
Don Hadwin, University of New Hampshire
David Handelman, University of Ottawa
David Larson, Texas A & M (featured speaker)
Steve Power, University of Lancaster
Ian Putnam, University of Victoria
Heydar Radjavi, Dalhousie University
Mikael Rordam, University of Copenhagen (tentative)
Visit www.math-cs.upei.ca/people/gmacdon/cosy.

International Conference and Workshop on Valuation Theory

July 26 – August 11, 1999

University of Saskatchewan

Dedicated to Paulo Ribenboim, this conference is intended to cover recent developments in valuation theory and its applications. On July 31 there will be a special session in honor of Paulo Ribenboim.

The main topics of the workshop will be local uniformization and resolution of singularities, model theory of valued fields in positive characteristic and its connections with resolution of singularities, the theory of valued function fields, approximate roots and related subjects, \mathfrak{o} -minimal expansions of the reals and Hardy fields. In addition, the workshop will offer an opportunity to discuss other recent developments and open problems which are connected to the scientific program of the conference. This conference is sponsored by the **Fields Institute**, the **Centre de Recherches Mathématiques** and **PIMS**.

Organizers

Andrew Carson, University of Saskatchewan
Franz-Viktor Kuhlmann, University of Saskatchewan
Salma Kuhlmann, University of Saskatchewan
Murray Marshall, University of Saskatchewan
Deirdre Haskell, College of the Holy Cross
Hans Schoutens, Wesleyan University

Invited Speakers Include

Shreeram Abhyankar, Purdue	James Madden, Baton Rouge
Carlos Andradas, Madrid	Jan Minac, Western Ontario
Ron Brown, Hawaii	F. van Oystayen, Antwerpen
Alexandru Buium, Urbana	Olivier Piltant, Paris
Gilles Christol, Paris	Florian Pop, Bonn
Vincent Cossart, Versailles	Patrick Popescu-Pampu, Paris
Michel Coste, Rennes	Victoria Powers, Emory
Tom Craven, Hawaii	Ana Reguera, Valladolid
Dale Cutkosky, Missouri	Paulo Ribenboim, Kingston
Nikolai Dubrovin, Vladimir	Peter Roquette, Heidelberg
Yuri Ershov, Novosibirsk	Mohamed Saidi, Bonn
Jose Engler, Campinas	Thomas Scanlon, Berkeley
Joachim Graeter, Potsdam	Claus Scheiderer, Regensburg/Duisburg
Urs Hartl, Ulm	Erwin Schoerner, Munich
Roland Huber, Wuppertal	Niels Schwartz, Passau
Sudesh Khanduja, Chandigarh	John Shackell, Canterbury
Hagen Knaf, Heidelberg	Patrick Speissegger, Toronto
J. Koenigsmann, Konstanz	Michel Vaquie, Paris
Leung Ka Hin, Singapore	Adrian Wadsworth, San Diego
Quing Liu, Bordeaux	
Francois Loeser, Paris	

Visit www.pims.math.ca/sections/activities/icwvt.html.

Frontiers in Mathematical Physics Summer Workshop on Particles, Fields and Strings

August 2–20, 1999

University of British Columbia

The **Centre de Recherches Mathématiques**, the **Pacific Institute for the Mathematical Sciences** and the **Asia Pacific Center for Theoretical Physics** are sponsoring *Particles, Fields, and Strings '99*. This Workshop is devoted to modern developments in mathematical physics, gauge and string theories. Topics to be featured in the plenary lectures include non-perturbative string and superstring theory, Anti-de-Sitter space and Conformal field theory, large-N QCD, confining strings, MQCD and duality, and M(atr)ix theory. There will be a limited number of lectures per day to allow participants to engage in informal seminars and discussions. Access to computer and library facilities will be provided to participants.

Plenary Lecturers

R. Dijkgraaf, Amsterdam
David Gross, Santa Barbara
Jeffrey Harvey, Chicago
Igor Klebanov, Princeton
Juan Maldacena, Harvard
J. Polchinski, Santa Barbara
A. Polyakov, Princeton
H. Verlinde, Princeton

Organizing Committee

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Gordon Semenov, UBC
K. S. Viswanathan, SFU
Ariel Zhitnitsky, UBC

Visit kepler.physics.ubc.ca/~pfs99.

AARMS Combinatorics Workshop at the CMS Summer Meeting

May 24–28, 1999

Memorial University

Along with the **Fields Institute** and the **Centre de Recherches Mathématiques**, **PIMS** is supporting a Combinatorics Workshop at the upcoming CMS Summer Meeting. This workshop, which is organized by the **Atlantic Association for Research in the Mathematical Sciences**, focus on problems in combinatorial designs and applications. It will involve a series of lectures given by some of the invited speakers at the session on Combinatorics and its Applications at the CMS Summer Meeting. The organizers of the workshop are **J. Brown** (Dalhousie), **R. Nowakowski** (Dalhousie), **A. Punnen** (UNB) and **N. Shalby** (Memorial). For more information on the CMS Summer Meeting, see www.math.mun.ca/~cms99.

Seminaire de Mathématiques Supérieures

Integrable Systems:

From Classical to Quantum

July 26 – August 6, 1999

Université de Montréal

This purpose of this seminar is review recent developments in Integrable Systems, particularly in the quantum domain. The principal lecturers will give mini-courses of 4 or 5 lectures that will be accessible to graduate students and young researchers newly entering the domain. This seminar is supported by the **Fields Institute**, **Centre de Recherches Mathématiques** and **PIMS**. The Canadian organizers are **John Harnad** (Concordia), **Luc Vinet** (Director, CRM) and **Pavel Winternitz** (U. de Montréal).

Principal Speakers

Denis Bernard, Saclay
Boris Dubrovin, SISSA, Trieste
John Harnad, Concordia University and CRM
Alexander Its, Indiana University
Vladimir Korepin, SUNY at Stony Brook
Andre Leclair, Cornell University
Tetsuji Miwa, RIMS, Kyoto
Alexios Polychronakos, University of Ioannina, Greece
Nicolai Reshetikhin, University of California, Berkeley
Simon Ruijsenaars, Amsterdam
Evgueni Sklyanin, St. Petersburg and University of Leeds
Craig A. Tracy, University of California, Davis
Pavel Winternitz, Université de Montréal

First 3 × 3 Canada-China Math Congress

August 23–28 1999

Tsing-Hua University, Beijing

This congress is the first event of the 3 × 3 Canada-China Mathematics Initiative, which is a collaboration of three

universities in China (Beijing, Tsing Hua and Nankai) and four universities in Canada (UBC, UT, McGill, U. de Montréal). The aim of this conference is to initiate collaborative relationships between mathematicians in Canada and mathematicians in China. It is expected that over 100 Canadian mathematicians will attend the congress.

Canadian Plenary Speakers

Jim Arthur, Univ. of Toronto
H. Darmon, McGill Univ.
Don Dawson, Fields Institute
Bill Pulleyblank, IBM
Nicole Tomczak-Yaegermann, Univ. of Alberta

Canadian Session Organizers

Number Theory: Kumar Murty, U. of Toronto
Partial Differential Equations: Nassif Ghoussoub, UBC
Differential Geometry: Maung Min-oo, McMaster
Representation Theory: Jim Carrell, UBC
Probability: John Walsh, UBC
Signal Processing/Wavelet: Jean-Marc Lina, CRM
Computational / Numerical Analysis: B. Wetton, UBC
Combinatorial Optimisation: A. Gupta, SFU
Topology: Steve Boyer, UQAM
Operator Theory/Functional Analysis: George Elliott, Toronto
Dynamical Systems: Jacques Belair, CRM
Visit www.pims.math.ca/sections/activities/ccmc99.html.

Special Session on Mathematical Physics at the CMS Winter Meeting

December 11–13, 1999

Université de Montréal

PIMS is pleased to be one of the sponsors of the Special Session on Mathematical Physics at the 1999 CMS Winter Meeting. This session, which is organized by **George Bluman** (University of British Columbia), **Michel Grundland** (UQTR), and **Gordon Slade** (McMaster University), will feature talks on:

- I. Probability methods and applications
- II. Group theory methods and application

Visit www.dms.umontreal.ca/Montreal-99.

Call for Proposals for Scientific Activities

PIMS invites applications for funding of workshops, conferences and similar scientific activities to commence after **April 1, 2000**. The deadline for submission of applications for review by the Scientific Review Panel is **April 15, 1999**. The guidelines for submitting proposals are available on the PIMS web site under the *Opportunities* section. Preferably, applications are submitted electronically in text, tex or latex format. Enquiries regarding this competition should be directed to the PIMS Scientific Coordinator, **Sandy Rutherford** (email: sandy@math.ubc.ca).

Report on Changing the Culture '99

The Second Annual Changing the Culture Conference, organized and sponsored by the **Pacific Institute for the Mathematical Sciences**, was held at SFU Harbour Centre on February 19–20. Again, it brought together mathematics researchers, educators and school teachers from all levels to work towards narrowing the gap between those who enjoy mathematics and those who think they don't.

The programme opened with a plenary talk by Leah Keshet (UBC), *The Study of Living Things: So, What's Math Got To Do With It??*, illuminating the abundant applications of mathematical models in biology. The first day closed with a public lecture by Doris Schattschneider (Moravian College, Pennsylvania), *Ingenious mathematical amateurs: M.C. Escher (artist) and Marjorie Rice (homemaker)*, describing how two talented and persevering amateurs made substantial contributions to the field.

The pivotal event on Friday was a 1 and 3/4 hour panel discussion on the question: *To what extent is an appreciation of mathematics possible without mathematical training?* The three very different positions taken by the panelists Kanwal Neel (BCAMT), Mike Fellows (UVic), and Jeremy Quastel (U of T) elicited a lively exchange with the audience — including the moderator, Klaus Hoechsmann.

In the morning, three discussion groups had been formed to ponder the questions:

1. *Can biology be a major context for math classes?*
2. *How do visualization and logic interact in mathematics?*
3. *Is applied math easier than pure math?*

The discussions were led by the organizers of the conference: Malgorzata Dubiel (SFU), Pamela Hagen (Westwood Elementary), and Klaus Hoechsmann (UBC), with the assistance of Bob Camfield, Djun Kim, and Nataša Sirotić, respectively. After the panel discussion, they met again and extended their deliberations to the additional common question: *Can people be taught to like mathematics?*

Saturday's opening talk was given by Adrian Lewis (University of Waterloo), *Would Pythagoras have liked Mozart?*, showing, among other things, that one of Mozart's last quartets begins with a musical square root of two. It was followed by a panel, moderated by Malgorzata Dubiel, which examined the question: *Mathematics and the Arts: where do they meet?* Owen Underhill (SFU) spoke about music — in particular, his opera *Star Catalogues* — Doris Schattschneider explained her mathematics course for Fine Arts Majors, and Ron Coleborn (BCAMT) enlivened his plea for a thinned out curriculum by his considerable acting talent.

Additional support for the conference, provided by the CMS and by SFU, is gratefully acknowledged.

Award

Continued from page 1.

The 3rd *Mathematics Unplugged* Conference for students from kindergarten to grade five will take place at Westwood Elementary School, Coquitlam on April 30. The keynote speaker will be Kathy Heinrich (Mathematics & Statistics, SFU) and the presenters will include Malgorzata Dubiel (Mathematics & Statistics, SFU), Ron Coleborn (President of the BCAMT), as well as parents, school staff and district staff.

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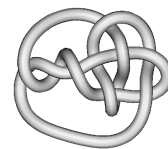
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This newsletter is available on the world wide web at www.pims.math.ca/publications.

Can you identify this knot?



Follow the link on the PIMS web page to the KnotPlot Site for some help.