



# Pacific Institute

for the Mathematical Sciences

email:pims@pims.math.ca  
http://www.pims.math.ca

## Newsletter

February 1998  
Vol.2 Issue 1

## PIMS, Fields and the CRM invited to develop NCE in the mathematical sciences

Canada's three mathematical sciences institutes have cleared the first hurdle in their application to the prestigious National Centres of Excellence program. Their letter of intent was one of only eleven selected, among 72 submitted nationally, to be invited to submit a full NCE proposal, which is due May 1, 1998.

"Mathematics of Information Technology and Complex Systems" (MITACS) is a joint initiative led by the Pacific Institute for the mathematical sciences (PIMS), the Fields Institute in Toronto and the CRM in Montreal. This proposed network is an initiative of the three major maths research institutes which collectively link together research groups at universities across the coun-

try and a growing number of partners from the sectors of information technology, financial services and medical sciences. From the foundations of these centers, this Network will build a broader, independent network that will capitalize on existing resources to pursue a unified research program of vital importance and application to Canadian industry.

Challenges of mathematical modeling and the management of complex and large-scale systems arise across the scientific, industrial, financial and medical sectors. Finding new tools to meet these challenges is intrinsically collaborative work requiring a mix of mathematical, statistical and computational methodologies. The major concentration areas for MITACS will be: Inference from High Dimensional Data, Biomedical Modelling and Biostatistics, Risk Management, Modelling and Management of Computer and Communications Networks, Techniques for Resource Optimization, Mathematical Algorithms and Technology based Mathematical Tools and Cryptography.

### PIMS Graduate Week-end

In a new initiative, the Pacific Institute for the mathematical sciences will be running the PIMS GRADUATE WEEKEND in Vancouver on the campuses of UBC and SFU, Feb.19-21. The goal is to give promising Canadian undergraduates a chance to learn more about the mathematical sciences graduate programs at the five PIMS universities in Alberta and B.C. (See page 4)

### PIMS and CICSAR launch the Industrial Working Seminar Series

As a part of PIMS and CICSAR (Centre for Integrated Computer Systems Research) industrial activities, the Industrial Working Seminar Series is designed to establish links with the local industry on a continuous basis. Once a month, an industry representative will be invited to present a mathematical problem that is relevant to his/her company to an appropriately chosen team of  
(continued Page 3)

**Dr. Hugh Morris, FRSC: New chair  
of PIMS Board of Directors (Page 2)**

### PIMS to celebrate James Mirrlees' Nobel Prize in economics

The recent Nobel laureate will be a keynote speaker at the 4th international meeting of the Society for Social Choice and Welfare (July 3-6) which is one of the main events in PIMS upcoming Thematic Summer on mathematical economics and finance. This conference which is organised by J. Weymark (UBC) will be used to celebrate Mirrlees' recent Nobel prize and the 25th anniversary of the Gibbard-Satterthwaite Theorem.

### PIMS Distinguished Lecturer:

#### Nevannlina Prize winner Avi Widgerson

On Monday April 6, Dr. Widgerson (Hebrew University of Jerusalem) will be giving a lecture entitled: "A Computational View of Randomness". This talk will be teleconferenced to all PIMS sites (including UNBC and U. Lethbridge) at 3:30 p.m. (BC), in an interactive mode, at each University's Media Centre.

# Director's Notes:

*Nassif Ghoussoub*

It took 3 years of hard effort from many people to open up the opportunities for the mathematical scientists in this country, especially for those of us in the West. Now that we have gained access to the NSERC envelope for the math. institutes as well as to the NCE program, we should know in the next few months whether we were really ready for these challenges.

- We were of course pleased to know that our Letter of Intent to the Network of Centres of Excellence program was one of the 11 successful letters out of 72. The letter of intent was submitted by the Directors of the three Institutes; CRM, Fields Institute and PIMS, for the NCE "Mathematics of Information Technology and Complex Systems" (MITACS). We have been invited to submit a full proposal by May 1, 1998. It is anticipated that 3 to 5 of these proposals will be funded. The proposed network is structured around the three mathematical sciences research institutes (The Fields Institute, CRM and PIMS) and the networks of universities affiliated with them. The invitation to present a full proposal creates an exceptional opportunity for the mathematical sciences community to develop a large scale systematic program for research, HQP training and the development of partnerships with key business, industrial and health care sectors across the country. Our most immediate goal is to get the word out so that we can involve as many as possible of Canada's best mathematical scientists. Towards this we will be holding on February 12 at 11:00 am (Pacific time) a teleconferenced information session about it to all PIMS universities to explain the MITACS initiative and to discuss what we all need to do next.

- PIMS is also currently preparing its proposal to NSERC for the 1999-2003 funding cycle. We are urging all PIMS-affiliated mathematical scientists to contribute to the development of the PIMS vision and plan for the next five years. We ask that you consider proposing a project (e.g. workshop, conference, thematic period, etc.,...). New ideas are sought: scientific projects, industrial collaborations as well as educational initiatives. Think big! We need imaginative, viable, high-quality proposals for future planning of PIMS-based activity. Such ideas are welcome any time, but we are asking you especially to put forward proposals well before the end of February '98, so they might be incorporated in the PIMS application for NSERC support, due April 1, 1998. If you have an idea which needs fleshing out, please contact your local PIMS Site Director who can help develop your proposal.

- We have received 38 applications for the PIMS Postdoctoral Fellowships for the academic year 1998-99. Applicants have all been sponsored by regular faculty members at one of the PIMS member universities. PIMS will provide \$10,000 for each of the top 20 of these applicants. The remainder of the fellow's support, from teaching, research grants, industrial sources, etc. is arranged by the sponsor. The selection will be done by the Scientific Review Panel chaired by Dr. David Boyd.

- Finally, we are extremely pleased with the selection of Dr. Hugh Morris for the chairmanship of PIMS Board of Directors. We feel fortunate as we are looking forward to work with someone who has already given so much for Canada's research and development effort.

## **Dr. Hugh Morris, FRSC: New chair of PIMS Board**

At its meeting on December 14, 1998 at the Empress Hotel in Victoria, PIMS Board of Directors elected Dr. Hugh Morris, as its new chair. He replaces Dr. Barry McBride who was recently appointed VP-academic and Provost at UBC. Dr. Hugh Morris holds a Ph.D in Mining Geology from the University of Witwatersrand, Johannesburg, South Africa and has 44 years of experience in the mineral industry. He is a fellow of the Royal Society of Canada and is Chair of the Society's Canadian Global Change Program.

From 1962 to 1979 he held a series of positions with Cominco Ltd. in its Exploration and Mining Departments in several Canadian locations, eventually becoming Director, Exploration for its worldwide activities. In 1979 Dr. Morris became associated with the E & B-Geomex Group of affiliated companies in Calgary, initially as President and Chief Operating Officer of Geomex Minerals Ltd., and in 1981, as President and Chief Executive Officer of E & B Canada Resources Ltd. Following the merger of the E & B-Geomex Group and Imperial Metals Corporation of Vancouver in May 1983, he was appointed Chairman and Chief Executive Officer of Imperial Metals and of three public companies within the Imperial Metals Group. He resigned from these positions in February 1993 to pursue other interests. Currently, he is a mineral industry consultant and board member of six Canadian public companies.

Dr. Morris has demonstrated special interest in national and international scientific and professional associations. He is a member of NSERC's Council, a member of the Standing Finance committee of ICSU, and Chairman of the Board of Directors of the Lithoprobe Project. He is past-president of the Geoscience Council of Canada, a past-president of the Geological Association of Canada, and was also Treasurer of the Canadian Geological Foundation from 1987 to 1996. He is a member of the Geological Society of London, the Institute of Mining and Metallurgy, U.K., the Canadian Institute of Mining and Metallurgy, a member of the Association of Professional Engineers of British Columbia and a number of other scientific and professional associations.

## Upcoming

### PIMS scientific events

- The 1998 Canadian Operator Theory and Operator Algebras Symposium, U. Alberta, Edmonton, May 21-May 25, 1998. Contact: tlau@math.ualberta.ca (A. Lau)
- Industrial Mathematical Modeling Workshop for Graduate Students, Simon Fraser University, May 25-29 1998. Contact: kpromisl@cs.sfu.ca (K. Promislow)
- Workshop on Network and Computer Security, Banff, Alberta, May 27-29, 1998. Contact: cleve@cpsc.ucalgary.ca (R. Cleve)
- Annual meeting of CAMS and Canadian Symposium on Fluid Dynamics, SFU Harbour center, May 28-31, 1998. Contact: gac@cs.sfu.ca (C. Graham)
- Second PIMS Industrial Problem Solving Workshop, June 1-5, 1998. Contact: calistra@math.ucalgary.ca (D. Calistrate)
- Computation, Statistics and Visualization in Petroleum Industry, Calgary, June 8-10, 1998. Contact: shen@cake.math.ualberta.ca (S. Shen)
- Pacific Rim Geometry Conference, UBC, Vancouver, June 28 - July 2, 1998. Contact: daustin@math.ubc.ca (D. Austin)
- Fifth International Workshop on Mathematical Aspects of Fluid and Plasma Dynamics, Wailea, Maui, Hawaii, June 28-July 3rd, 1998. Contact: rillner@math.uvic.ca (R. Illner)
- Canadian Undergraduate Mathematics Conference, UBC, July 9-12, 1998. Contact: kozdron@unixg.ubc.ca (M. Kozdron)
- Workshop on Micromechanical Models of Fracture Processes, UBC, July 1998. Contact: peirce@math.ubc.ca (A. Peirce)
- Western Canada Linear Algebra Meeting (W-CLAM), University of Victoria, July 30-31, 1998. Contact: pvdd@math.uvic.ca (P. van den Driessche)
- Workshop on Coding Theory, Cryptography, and Computer Security, Lethbridge, Alberta, August 3-7, 1998. Contact: hadi@cs.uleth.ca (H. Kharagani)

## PIMS and CICSР launch the Industrial Working Seminar Series

(from Page 1)

mathematical scientists and engineers. A follow-up session will be arranged for further discussion which will provide a basis for continuous collaboration. To insure success, the industrial facilitator (**Huaxiong Huang**) will identify suitable problems, will contact the appropriate research groups associated to PIMS and CICSР and will keep both industrialists and academics in constant contact. The first seminar will be given on February 12 by **Murray Margolis**, Manager of **Powerex** and will deal with the complex problems of developing "Optimal Trading Strategies for electrical power".

## CHANGING THE CULTURE:

### Towards a closer Mathematics Community Feb. 20-21, 1998, SFU at Harbour Centre

The conference will continue the work initiated by the 1995 BC Miniforum on Education in Mathematics, bringing together mathematicians, mathematics educators and school teachers from all levels to work together towards changing the culture of school mathematics, to allow students to experience what DOING mathematics means.

Plenary talks will be given by **Peter Taylor (Queen's University)** and **Bruce Schawyer (Memorial University)**. There will be two panel discussions on "What is happening in the math class" and "Doing mathematics with students" as well as three discussion groups on themes like "What sort of mathematics do we want to see in the school setting?" and "Doing mathematics with Children".

Participants include **Becky Mathews** (BC Ministry of Education, Skills and Training), **Tom O'Shea** (Education, Simon Fraser University), **David Ryeburn** (Mathematics, Simon Fraser University), **Malcolm Sneddon** (Ministry of Education, Skills and Training), **Pamela Hagen** (Westwood Elementary School), **Nathalie Sinclair** (Simon Fraser, Island Pacific School) and **George Bluman** (University of British Columbia).

# PIMS forum on industrial mathematics, SFU-UC

May 25-June 5, 1998

Following on the heels of its highly successful Industrial Problem Solving Workshop, PIMS has recently announced an annual Forum on Industrial Mathematics to take place May 25-June 05, 1998. The forum will feature a series of events designed to bring together academic scientists, graduate students, and industrial researchers in the mathematical sciences to investigate industrial mathematics. One of the main goals of the forum is to train graduate students in the various aspects of high-level industrial mathematical research and this theme is clearly evident in the selection of events.

In its inaugural year, the forum will feature three marquee events. Kicking off the forum will be a one week **Graduate Industrial Modeling Workshop** at SFU from May 25-29, 1998. Between 25 and 30 graduate students from the PIMS universities will come together to learn techniques for solving industrial mathematics problems. The participants will work in small groups learning the most recent modeling techniques from experts in the field. The students will come away with a foundation for understanding and contributing to the next two events. Immediately following the modeling workshop will be the **Annual meeting of the Canadian Applied Math Society (CAMS)** in downtown Vancouver (May 28-31). The graduate student attendees from the workshop will have a chance to hear research talks by some of the best applied mathematicians from across Canada. They will see how many of the techniques they just learned have been applied to make major breakthroughs in applied mathematics.

The following week (June 1-5), PIMS will sponsor the **Second Industrial Problem Solving Workshop** at the University of Calgary. Once again PIMS will solicit industrial problems from industry in BC and Alberta with teams of graduate students and scientists working together to model these problems and ultimately yield partial or full solutions. It is anticipated that many of the participants at the CAMS meeting will take the unique opportunity of attending the workshop. PIMS will cover the travel expenses of the graduate students attending the three events. The students will now have a chance to try out their newly acquired skills and make a significant contribution to the solutions of these new problems.

## PIMS Graduate Week-end:

**UBC-SFU Feb. 19-21** *(continued from Page 1)*

Students that meet our graduate criteria will be invited from all over Canada to be PIMS guests for a couple of days in Vancouver. It is an opportunity for them to interact with faculty and graduate students and to meet their peers from across Canada.

## BC Government Press release about PIMS

Following the PIMS funding decision of the BC government, Dan Miller, minister responsible for the B. C. Information, Science and Technology Agency, said the funding will provide application of high-level mathematical methods in the development of B.C.'s industries. "British Columbia's economy is diversifying at a rapid rate, and technology-based industries are taking their place in the market and playing a prominent role in job creation," said Miller. "The application of mathematics to daily challenges found in many sectors is leading to increased productivity...The potential of the Pacific Institute for the Mathematical Sciences has been recognized as a valuable resource".

### PIMS Contact List

Director: N. Ghoussoub  
Admin. Asst: Shannon Phillips  
Phone: 604-822-9328  
Fax : 604-822-0883  
e-mail: director@pims.math.ca

SFU-site Director: A. Gupta (Comp. Sci.)  
Admin. Asst: Thomas Uphill  
Phone: 604-291-3349  
Fax : 604-291-3045  
e-mail: arvind@cs.sfu.ca

UVic-site Director: Ian Putnam (Maths & Stats)  
Admin. Asst: Kelly Choo  
Phone: 250-472-4271  
Fax : 250-721-8962  
e-mail: chook@math.uvic.ca

UBC-site Director: D. Rolfsen (Maths)  
Admin. Asst: Emma MacEntee  
Phone: 604-822-3922  
Fax : 604-822-0883  
e-mail: rolfsen@math.ubc.ca

UA-site Director: A. Rhemtullah (Math. sciences)  
Admin. Asst: Patti MacDonald  
Phone: 403-492-3396  
Fax : 403-492-6826  
e-mail: patti@vega.math.ualberta.ca

UC-site Director: C. Laflamme (Maths & Stats.)  
Admin. Asst: Joanne Longworth  
Phone: 403-220-5203  
Fax : 403-282-5150  
e-mail: jlongwor@acs.ucalgary.ca