



Pacific Institute *Newsletter*

for the Mathematical Sciences

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NSERC Supports PImS Outreach Activities

PImS received \$400,000 of funding for the next two years from NSERC's Research Partnerships Program under the University--Industry collaborative activities component. This will allow us to continue carrying on the important scientific activities compatible with a vision of outreach to other disciplines and sectors. The funds will be used to further the mission of PImS as an organization that promotes the integration of the mathematical sciences between the research, industrial and educational communities.

PImS Organises Oxford Study Program

July 1-August 31, 1997

PImS will be holding an Oxford study program in the summer of 1997 to develop a study group model in Canada based on the highly successful Oxford model for bringing mathematical scientists and industrial problems together in a creative and productive forum. This initiative is part of the PImS industrial strategy to establish ongoing contacts and collaborations between PImS academic and industrial members.

The coordinator of the study program, Dr. Gordon Semenov (Physics, UBC) has invited Dr Tim Myers of Cranfield University in the UK and Dr Barbara van der Fliert of the University of Leiden, both members of the Oxford Study Group, to come to BC and Alberta to act as consultants in putting together the PImS study group. Drs Cranfield and van der Fliert will be collaborating with Drs Doug Beder and Dan

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PImS to gain access to NSERC's envelope for Maths Institutes

Of great importance was the decision of NSERC to follow the recommendation of the Canadian Math Review Panel and allow PImS access to the Mathematics Institute envelope for its core funding. This allows PImS to receive the same consideration for grants as the Fields Institute in Toronto and the CRM in Montreal and should greatly strengthen the mathematical sciences community as a national presence in Canada. The three institutes are to submit their applications before April 98 for the 1999-2003 funding cycle.

Fields and PImS launch a National Research Network

In collaboration with the Centre for Integrated Computer System Research (CICSR) and Communications and Information Technology Ontario (CITO*), the Fields institute and PImS are in the process of developing the **National Network for Mathematical Sciences in Industry: Finance, Technology, Health and Environment**. On June 1st, the director of the Fields institute, Dr. Don Dawson submitted a letter of intent to NSERC's research network program outlining the project. The main research topics that the network will develop are: Financial Mathematics, Communication and Information Technology, Signal Processing, Health and Environmental Science and Technology based Mathematical Sciences.

(*) CITO will begin operations January 1, 1998 from a merger of the two present Ontario Centres of Excellence ITRC and TRIO.

Director's Notes

Nassif Ghoussoub, FRSC

I am pleased to report that the Pacific Institute for the mathematical sciences (PIms) has reached a successful end to its inaugural year. As part of Canada's third institute for the mathematical sciences, PIms' scientists have worked tirelessly to build a unique institute within Canadian mathematics and to secure funding to insure its continued existence. The outlook is indeed positive: it is now clear that PIms is here to stay as an integral part of the Canadian scientific and international mathematical community.

Our vision for PIms is to coordinate the activities of mathematical scientists at the five founding universities in western Canada---the Universities of Alberta, British Columbia, Calgary, Victoria and Simon Fraser University---and to link them more closely with mathematical scientists in the rest of Canada and the world.

PIms has an ambitious mandate to further the mathematical sciences by supporting basic research, developing closer working relationships with colleagues in other academic disciplines and in industry, and forging deeper connections with educators. At the end of our first year, most of our planned intellectual activities are underway and many exciting new projects are in development. While these efforts are briefly described in this newsletter, we offer here the following summary.

1. More than 50 scientific workshops, conferences and summer schools have either been organised or are in the planning stages. Topics range from bio-mathematics to group theory and high performance computing.
2. Our educational panel has been particularly dynamic organising, among other things, "Evenings in Mathematics" with schools and summer workshops for high school math teachers.
3. Our industrial programs are underway with four PIms industrial facilitators already in place BC and Alberta. They are organising the Industrial Oxford study program coming this summer and have also connected our scientists with various scientific projects in the private and public sectors.
4. Six PIms Industrial PDFs have been awarded with matching funds coming from various industrial projects.

5. Twelve Interdisciplinary PDFs have been awarded to young scientists going to work in each of the 5 founding universities.
6. Several Technology-based math projects will be awarded soon, to young scientists working on topics ranging from *interactive mathematics* to *electronic publishing*.
7. Three upcoming thematic summers have been planned in collaboration with the Fields Institute. The themes are *Probability and Applications* in 1997, *Mathematical Economics and Finance* in 1998, *Mathematical Biology* in 1999.

In addition, we are working closely with the Fields Institute to coordinate the activities of mathematical scientists at a national level. We view this as a first step towards the development of a single, truly national mathematical institute which would unite all Canadian mathematical scientists and provide overall direction on a national scale.

While there have been setbacks along the way, PIms now has the funds available to support these worthwhile projects. NSERC has provided \$400,000 from the University-Industry Collaborative Activities component of their Research Partnerships Program. In addition, NSERC has recognized the national importance of PIms by allowing PIms equal access, along with the two older Canadian mathematics institutes, to the NSERC math institutes envelope. In western Canada, the founding universities in Alberta and British Columbia have renewed their funding commitments for PIms. Furthermore, both the Alberta Science Research Agency and the British Columbia Ministry for Employment and Investment have expressed interest in supporting our initiatives and discussions with them are currently underway.

That PIms is already able to support such a wide array of scientific, industrial, educational and technology-based mathematical activities is testimony to the strength of our vision and the dedication of dozens of distinguished scientists. Through their volunteer efforts, we are developing the Canadian scientific infrastructure and creating exciting opportunities for the following generations of mathematical scientists. In the coming year, we look forward to enjoying further the benefits of their work.

Vancouver, May 25, 1997

PIms appoints 6 Industrial Postdoctoral Fellows

Central to the PIms industrial strategy is the establishment of industrial contacts and industrial research projects. Jointly supervised by PIms scientists working in concert with their industrial counterpart, PDFs will split their time between the university and the company, carrying intellectual ideas between these two domains. PIms has already identified six postdoctoral fellows as key players in the following projects.

1. IRIS 3 Core Thrust Project, UBC
2. Noise Reduction of digitally compressed video signals, UBC
3. Numerical Simulation of Flow in Porous Media, U. Alberta
4. Acoustic Oil-well Soundings, U. Calgary
5. Medical Imaging, SFU
6. Algorithmic Optimization, SFU

PIms awards 12 Postdoctoral Fellowships in the Mathematical Sciences

The selection of PIms postdoctoral fellows in the mathematical sciences were made by the "local" subset of PIms' Scientific Review Panel consisting of D. Boyd, UBC (Chair), N. Pippenger (UBC), A. Lachlan (SFU), B. Moody (Alberta), G. Slade (McMaster).

The following young scientists were awarded PIms Postdoctoral Fellowships for the academic year 97/98:

Zalman I. Balanov (Alberta), Devraj Basu (Victoria), Tirthankar Bhattacharyya (Calgary), Stephen Kwok-Kwong Choi (SFU, UBC), Sadok Kallel (UBC), David A. Krebes (UBC), Yves Lucet (Alberta, SFU, Victoria), Oleg N. Smirnov (Alberta), John Michael Stockie (SFU), Holger Teismann (Victoria), Meijun Zhu (UBC), Kazuhisa Makino (SFU).

PIms sponsors sessions at CMS meetings

PIms will contribute to the scientific activities of the Canadian Mathematical Society by sponsoring and organizing super-sessions at both the Winter and Summer meetings of the CMS. For this year, PIms is supporting :

-- a Workshop in Group Theory and Topology at the CMS Summer meeting in Winnipeg on June 10-11, 1997. Dale Rolfsen is the main organizer while the list of speakers include S. Boyer (UQAM), G. Cliff (Alberta), M. Davis (Ohio State U), M. Dunwoody (Southampton), R. Fenn (Sussex), S. Gersten (Utah), C. K. Gupta (Manitoba), N. Gupta (Manitoba), J. Howie (Heriot-Watt), S. Matveev (Chelyabinsk), A. Nicas (McMaster U), L. Paris (Bourgogne), I.B.S. Passi (Panjab), D. Sjerve (UBC) and P. Zvengrowski (UC).

-- a Workshop on Partial Differential Equations during the CMS Winter meeting in Victoria, BC . on Dec. 14-17, 1997. The organisers are N. Ghoussoub and C. Gui and the list of speakers include A. Chang (UCLA), P. Yang (USC), L. Evans (Berkeley), F.H. Lin (Chicago), N. Alikakos (Tennessee), H. Tehrani (Las Vegas), J. Xin (Arizona), J. Feldman (UBC), R. Froese (UBC), I. Sigal (Toronto), C. Sulem (Toronto), M. Zhu (UBC), G. Fang (UBC), J. Chen (UBC-MIT), S. Alama (McMaster), W. Allegretto (Alberta), K. Promislow (SFU), R. Illner (Victoria), P. Bates (BYU) and X. Chen (Pittsburg).

(Oxford Group at PIms, continued)

Calistrate (Calgary) in visiting local industry in BC and Alberta in July and August.. A multi-day workshop (August 25 - 29) will then be organised with participants from industry and universities under the guidance of the director of the Oxford group, Dr. John Ockendon. Those wishing to participate in this study group can get further information by e-mail at pims@pims.math.ca or beder@physics.ubc.ca.

Education: a PImS Priority

Mathematical Scientists at all of PImS member institutions have a deep commitment to mathematics education. Part of the PImS mandate is to support activities which forge closer links between these scientists and the public school system. We also want to support projects which continue the tradition of bringing mathematical sciences *alive* for students.

On January 23, PImS hosted an evening on **Alternative Math Education** at McKenzie Elementary School in Victoria. Organizer: David Leeming

On May 9, PImS organised jointly with the Alberta Ministry of Education a **Math Leaders Symposium** in Calgary, Alberta. Organizer: Claude Laflamme

On May 30, PImS initiated **Mathematics Unplugged**, a student mathematics conference at Westwood Elementary School, Port Coquitlam, B.C. Organizer: Pamela Hagen

Watch for the upcoming **Conference on Changing the Culture** to be held at SFU on November 7 - 8, 1997 featuring talks by Peter Taylor (Queen's University) and Bruce Schawyer (Memorial University). Participants will include those from the mathematics community, mathematics teachers and people from industry. Two main themes for discussion groups will be "*What sort of mathematics do we want to see in the school setting?*" and "*Doing mathematics with Children.*" PImS expects that ideas for future PImS programs will emerge from these discussions.

PImS and HPC-net support Technology-based mathsci.

In collaboration with the High Performance Computing Network (HPC-net), PImS will be sponsoring through **The Polymath Group** at CECM, **The Living Math Group** at UBC and several qualified scientists in Alberta, the development of new tools for teaching, learning, promoting and doing mathematics with computers.

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Fields and PImS organise joint thematic years

The Fields institute and PImS are planning to develop and organize jointly their thematic years. Most of the winter thematic activities will happen at the Fields institute while the summer activities will be at any of the five sites of the Pacific Institute. The first joint thematic year will be in 1998/1999 where the topic will be **Probability theory and Mathematical Biology**. The 1999/2000 year is at the development stage and will focus on **Computational Combinatorics**.

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