Submissions

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Reports from the Society

President’s Report ....................... 2
Board of Directors ..................... 5
Minutes from 2011 AGM ............... 9
Committee Members ................. 12
Membership Committee Update ..... 13
Report on ICIAM 2011 ............... 14

Society Updates

CAIMS•SCMAI Awards ............. 17–18
2012 Election – Call for Nominations ......................... 19
CAIMS•SCMAI 2012 – Call for Proposals .................. 20
2011 Nerenberg Lecture ............. 21

General News and Upcoming Conferences

Fields Institute ......................... 23
CRM .................................... 24
PIMS .................................. 25
Waterloo Summer School ........... 27

Position Announcements

........................................ 28

Back Cover
CAIMS•SCMAI 2012 Announcement
President’s Report
by Jianhong Wu, CAIMS·SCMAI President

Let me start by inviting CAIMS·SCMAI members to the 2012 CAIMS·SCMAI annual meeting, which will be held at the Fields Institute, Toronto, June 24-28. The Scientific Committee, co-chaired by Professors Abba Gumel (Manitoba), Huaxiong Huang (York) and Nilima Nigam (Simon Fraser), has put together an exciting program focusing on themes which not only reflect the current research interests of CAIMS·SCMAI members and the wider global applied and industrial mathematics community, but also to highlight the research expertise and interests of mathematical scientists within the local universities, government labs and industry. Details of the 2012 annual meeting can be found at <http://www.caims.ca/caims2012.html>. I am also very pleased to announce that the 2013 annual meeting will take place in beautiful Québec City, hosted by University of Laval.

Annual meetings have been major events for CAIMS·SCMAI members to exchange ideas, to discuss new advances, and to open new frontiers. The 2011 annual meeting was held in conjunction with ICAIM2011, and this Congress was co-organized by CAIMS·SCMAI, MITACS and SIAM. Professor Kenneth Jackson (Toronto) provided a report, included in this Newsletter, that documents the great success of ICIAM2011. In addition to this spectacular Congress held in Vancouver, a number of Embedded and Satellite events were held across the country. I attended quite a few in Toronto, in Vancouver, and in Edmonton. I was impressed by the diversity and quality of these events, but I was also told that I missed many more!

Ken was the vice chair of the Congress. Other CAIMS·SCMAI representatives in the Congress organization include Professor Paul Muir (St. Mary’s University)/Finance Committee and Professor Bob Russell (Simon Fraser)/Steering Committee, and many CAIMS·SCMAI members contributed very much in different capacities to the great success of CAIMS2011 and its satellite events which demonstrated the highest scientific and professional standard of the Canadian industrial and applied mathematics community. Professor Arvind Gupta, the Scientific Director of MITACS, and his team deserve a special note of thanks for their perfection in organizing this Congress.

During the Congress, and in a joint CAIMS, Mprime, and SIAM prize luncheon, a few outstanding Canadian scientists were honored: Michael Ward (University of British Columbia) was awarded the CAIMS·SCMAI Research Prize, Adam Oberman (Simon Fraser University) received the CAIMS/PIMS Early Career Award, and Ian Frigaard won the CAIMS-Mprime Industrial Mathematics Prize. The prize lectures by these winners, along with the plenary talk by Mark Lewis (the 2009 winner of the CAIMS·SCMAI Research Prize) were well at-
tended and received. I would like to take this opportunity to congratulate the prize winners again for their achievements, representing the Canadian excellence in industrial and applied mathematics.

While celebrating the achievements of our society, we should notice that the environment for conducting teaching and research in industrial and applied mathematics in Canada is changing. MITACS, after its fantastic success in undertaking team-based mathematical research, partnering academics with receptors, was re-organized into two separate organizations (MITACS and Mprime) and the mathematical sciences Network of Centres of Excellence assumed the name Mprime Network. CAIMS•SCMAI is looking forward to continuing the fine tradition of fruitful collaboration with the mathematical sciences NCE centre, and I am pleased that Mprime pledged its continuing support for the CAIMS-Mprime Industrial Mathematics Prize. NCE funds to Mprime will terminate in 2012. These funds, a major investment to mathematical sciences by our federal government, has generated so much gain for the Canadian economy due to the huge success of this MCE centre in linking the mathematical community to its receptors that there is every reason to expect that a portion of this gain will be reinvested to further the Canadian leadership in building a sustainable national capacity of mathematical sciences with focus on bridging the gap between theory and application and on linking public policy to industrial implementation. It requires collective wisdom and effort of the mathematical community to communicate the value of this reinvestment to our governments and the general public, and to ensure that large team-based mathematics led interdisciplinary research be well funded.

In response to the request for input to the Long Range Plan (LRP) for Mathematical and Statistical Sciences, Ian Frigaard (President-elect of CAIMS•SCMAI) collected a number of points of general interest/concern to the applied and industrial math community in Canada as represented by CAIMS•SCMAI. The CAIMS•SCMAI input noticed the wide spectrum of views as to what could/should be done about the Institutes, ranging from maintaining the current structure & ensuring fairness of benefit amongst mathematical disciplines right through to establishment of an “Applied Math Institute”. The input expressed our favoring the cohesiveness of the mathematical community as a whole and offered to work constructively with both the institutes and NSERC to ensure the robustness and dynamism of the Canadian research environment.

There have been intensive discussions about the change of the NSERC Discovery Grant (DG) Program and the Evaluation Groups(EG) relevant to applied and industrial mathematics. Many concerns arise largely due to the unique interdisciplinary nature of CAIMS•SCMAI members, and the increasingly important role of mathematics in leading interdisciplinary research and training. A large proportion of our members do not receive funding from the math EG: some of these people do very well in other EGs, but others are discriminated against for
being “too mathematical”. There are also some concerns about preserving the integrity and robustness of the applied math community in the face of developing disciplines.

As a volunteer run organization, CAIMS•SCMAI depends very much on the unselfish service of our members for its growth and well-being. Critically important are the works of various committees and the participation of our representatives in many national and international groups. I would like to thank all CAIMS•SCMAI committee members and representatives for their service. I would like express our appreciation for the past president Professor Jacques Bélair (Montréal), the retiring Executive Committee members Professors Abba Gumel (Manitoba) and Bob Russell (SFU), the retiring Board members Professors Sharene Bungay (Memorial University of Newfoundland), Lucy Campbell (Carleton) and Rob Corless (Western Ontario) for their service and leadership, and I am looking forward to working with them in other capacities. Sharene, for example, is now serving CAIMS•SCMAI as the Secretary. I would also like to welcome the new board members Professors Matt Davison (Western Ontario), Nilima Nigam (SFU) and Hongmei Zhu (York), and the chairs and members of various CAIMS•SCMAI committees.

Did I congratulate Professor Bob Russell for the 2011 Arthur Beaumont Distinguished Service Award? It was a difficult task for the Prize Selection Committee and the Executive Committee to finalize the citation, because Bob served CAIMS•SCMAI in so many roles and we could hardly distinguish what constitutes the most essential. We decided eventually that Bob deserves the award for “his outstanding contributions and service to Applied Mathematics in Canada and for the tireless, strong passion, commitment, vision and exemplary leadership he has provided for CAIMS since its inception”. Congratulations Bob, imagine what CAIMS•SCMAI would be with many members like you!
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Minutes of the CAIMS•SCMAI Annual General Meeting
Monday, July 18, 2011, 12-1:30 PM
Vancouver Convention Centre

The new President (Jianhong Wu) called the meeting to order at 12:05 PM. Approximately 40 members of the society were present. Jianhong welcomed everyone to the Annual General Meeting.

1. Approval of Agenda: It was moved by Dhavide Aruliah and seconded by Nicholas Kevlahan that the agenda be approved as written. Carried

2. Approval of Minutes of AGM of July 19, 2010: It was moved by John Stockie and seconded by Fred Brauer that the Minutes of the General Meeting of July 19, 2010 be approved. Carried

3. Matters Arising out of Minutes: There were no matters arising out of the Minutes.

4. President’s Report: Jianhong presented his President’s report, as summarized below: Jianhong noted that ICIAM 2011 provides a good opportunity for CAIMS members to meet with each other. He acknowledged the presence and notable contributions of some former CAIMS Presidents including Wayne Enright, Roderick Wong, Sam Shen, Ken Jackson and Bob Russell.

Jianhong expressed his profound appreciation to Lucy Campbell, Rob Corless and Abba Gumel, whose tenure on the Board expired at this AGM, for their service to CAIMS.

He thanked the organizers of CAIMS 2010 (Sharene Bungay and Serpil Kobabiyik) for the successful hosting of CAIMS 2010 in St. John’s, Newfoundland last year. He also thanked Arvind Gupta and the entire MITACS administrative team for the great effort in putting together ICIAM 2011 (with CAIMS 2011 as a major component).

He acknowledged the contributions of the various CAIMS Prize Committees for selecting this year’s award winners, named below:

- Arthur Beaumont Distinguished Service Award: Bob Russell (SFU)
- CAIMS-PIMS Early Career Award in Applied Mathematics: Adam Oberman (SFU)
- CAIMS-Mprime Industrial Mathematics Prize: Ian Frigaard (UBC)
- Research Prize: Michael Ward (UBC)

He noted that the CAIMS-MITACS Prize is now renamed as CAIMS-Mprime Prize, due to the recent reorganization at MITACS NCE. He also stated that due to some unavoidable reasons the 2010 Cecil Graham Doctoral Dissertation Award could not be given at this AGM. However, he reiterated that all efforts are underway to fix the problem, and that the award will be given separately at next year’s annual meeting. Jianhong welcomed the following new
Board members: Matt Davison (UWO); Nilima Nigam (SFU) and Hongmei Zhu (York).

He emphasized the importance of service of the various CAIMS committees, and he plans to work with the President-elect to update the composition of the committees and the committee structure. He urged members to be more active and engaged. This, he emphasized, is critical to the success of CAIMS.

5. Treasurer’s Report: Dhavide Aruliah presented his report regarding the Financial Statement and Membership Statistics. The bank balance as of 30 April 2011 was $64,795.12. Our total asset was $117,726.40. Total revenue for 2010 was $22,875.89 and the total expenses for 2010 were $17,736.87.

The Financial Statement was examined by L’naya Hindman (Planning and Budget Officer, Faculty of Science, University of Ontario Institute of Technology).

6. Membership Committee Report: Dhavide Aruliah presented the Membership Committee report (on behalf of Lucy Campbell), highlighting the following issues: The online membership application and renewal facility continues to be a success; Regular membership numbers for this year are considerably lower than last year’s. The number of Institutional Members is also relatively low (although more renewals have been received lately). This is attributed to the fact that some members and Institutions have not renewed their membership as at the time of the AGM. Regular reminders would be sent to members and the Institutions (via the Liaison Committee and other sources) to renew their membership.

7. Secretary’s Report: Abba Gumel presented his report, as summarized below:

Abba outlined his main areas of responsibility as Secretary over the last year, including maintaining the web site, producing 9 electronic newsletters since last year’s meeting, and producing the printed Annual Newsletter (these newsletters are all on the CAIMS website).

Abba acknowledged the support CAIMS has been receiving from the Department of Applied Mathematics at the University of Waterloo in providing the platform for our website and membership database. Also, James Treacy has continued to do the typesetting for our Annual Newsletter.

Elections were held in April/May 2011 for President-elect (vacated by Professor Jianhong Wu), Secretary (vacated by Professor Abba Gumel) and three Member-at-Large positions (vacated by Professors Sharene Bungay, Lucy Campbell and Rob Corless) on the Board of Directors of CAIMS•SCMAI. The Secretary position was filled by acclamation, there being only one candidate (Professor Sharene Bungay, Memorial University of Newfoundland) for the position. Professor Bungay will serve as Secretary until the 2013 CAIMS•SCMAI Annual Meeting.
The following were elected:

- President-elect: Professor Ian Frigaard (2011-2013)

8. Update on NSERC’s Long Range Plan

Nancy Reid (University of Toronto) presented an update on NSERC’s Long Range Plan. She reported that consultations (with Mathematics and Statistics Departments) have been carried out and numerous constructive recommendations received. Some of the main concerns expressed are:

- Aspects of evaluation (HQP counts for 1/3 of total points; separate this from assessment of quality; HQP assessment needs to consider size of the department and existence of graduate program; Merit evaluation seems to be unstable).
- The trend to fewer, larger, grants (Mathematics needs broad base of support; undergraduate research at small places important to the pipeline; Research capacity built at small places in danger of disappearing; Possibly larger negative impacts on women in mathematics).
- Envelope model might lead to further shrinking of Discovery Grants.
- Interdisciplinary work is at risk of falling through the cracks.
- Institutes not having enough impact in Statistics.
- Current evaluation system (based on the 2011 Discovery Grants) seems to be “broken”.

There was some constructive discussion on a number of aspects of the presentation relevant to CAIMS members.

9. Future CAIMS Meetings:

Jianhong reported that Wilfrid Laurier University is unable to host the 2012 CAIMS meeting, as tentatively scheduled last year. He and the President-elect are exploring other suitable places to host the meeting.

10. Other Business: Michael Li (Managing Editor, CAMQ) reported that discussions are underway for Springer to take over the publication of CAMQ. These discussions are quite promising.

The meeting was adjourned at 1:25 PM.
Committee Membership

1. Cecil Graham Doctoral Dissertation Award Committee: Yau Shu Wong (Chair, Alberta), Sebastian Ferrando (Ryerson), Gilbert Laporte (Montréal), James Watmough (UNB)

2. Arthur Beaumont Distinguished Service Award Committee: Sue Ann Campbell (Chair, Waterloo), Paul Muir (St. Mary’s), Bryant Moodie (Alberta)

3. CAIMS Research Prize Committee: Anthony Pierce (Chair, UBC), Uri Ascher (UBC), Jacques Belair (UdeM), Bob Russell (SFU), John Chadham (UPittsburgh)

4. CAIMS/PIMS Early Career Award in Applied Mathematics: Mark Lewis (Alberta), Michael Ward (UBC), Mike Shelley (Courant), Wayne Enright (Toronto)

5. CAIMS-Mprime Industrial Mathematics Prize: Fahima Nekka (Chair, U. Montréal), Hermann Eberl (Guelph), David Bremner (UNB), Yong Wang (RBC)

6. Nominating Committee: Ian Frigaard (Chair, UBC), Dhavide Aruliah (UOIT), Jianhong Wu (York), Jacques Belair (UdeM)

7. Membership Committee: Matt Davison (Chair, Western), Dhavide Aruliah (UOIT), Lucy Campbell (Carleton)

8. Human Rights Committee: Ken Jackson (Chair, Toronto), Gail Wolkowicz (McMaster), Sue Ann Campbell (Waterloo)

9. CAIMS 2012 Organizing Committee: Abba Gumel (Manitoba), Huaxiong Huang (York), Nilima Nigam (SFU)

10. CAIMS 2012 Scientific Program Committee: Ian Frigaard (UBC), Pietro-Luciano Buono (UOIT), Matt Davison (UWO), Michael Haslam (York), Richard Karsten (Acadia), Adam Metzler (UWO), Bartosz Protas (McMaster), Mary Pugh (Toronto), Siv Sivaloganathan (Waterloo), Ray Spiteri (Saskatchewan), Pauline van den Driessche (UVic), Buks van Rensburg (York), Michael Ward (UBC), Huaiping Zhu (York)
Membership Committee Report
by Lucy Campbell

Over the past year the main activities of the Chair of the Membership Committee involved coordinating and communicating with the Liaison Committee to send membership renewal reminders to the member institutions and to compile and update the database of associated institutional members.

Membership renewals and new applications continue to be accepted through the online registration system which can be accessed via a link on the CAIMS•SCMAI main page <www.caims.ca>. Membership forms in PDF format are also available on the CAIMS•SCMAI website.

CAIMS•SCMAI regular members enjoy free electronic access to the Canadian Applied Mathematics Quarterly, as well as the benefits of reciprocity agreements with the corresponding societies in the US, Germany, and France, namely SIAM, GAMM and SMAI. Institutional members can subscribe to the Canadian Applied Mathematics Quarterly at a discounted rate and all graduate students, postdocs, visitors and new faculty members at these institutions are eligible for free associated membership.

Lucy Campbell (Carleton) ended her term as the Chair of the Membership Committee and Matt Davison (Western) took over in October. Lucy agreed to remain a member of the committee and will also continue to be the Liaison Committee representative for Carleton.

As always, the Membership Committee is open to inquiries, new suggestions and ideas on how to improve the offerings of CAIMS•SCMAI to its members. The committee can be contacted by sending e-mail to the Chair, Matt Davison <mdavison@uwo.ca>.
Report on ICIAM 2011

by Ken Jackson

ICIAM 2011 was a great success, with over 2760 delegates from 74 different countries. There were 27 invited speakers, whose talks spanned a broad range of topics in applied and industrial mathematics, from a “Mathematical Theory of Climate Sensitivity” to “The Next Generation Scientific Programming & Mathematical Modelling Languages”. Most of the invited talks also had an associated “Thematic Minisymposium”, where the topic was explored further. In addition, there were over 500 contributed minisymposia and many contributed talks. The organizing committee made a special effort to include a strong industrial mathematics component in the program, which included a series of Industrial Minisymposia. The outreach activities featured a special screening of “Achieving the Unachievable” by celebrated documentary film-maker, Jean Bergeron, and a very entertaining public lecture entitled “Math In & Out of the Zoo” by Prof. Chris Budd of the University of Bath. ICIAM 2011 was also complemented by 17 Satellite Meetings, most the week before or the week after the Congress, many in the Vancouver area.

We were saddened by the passing of Prof. Jerry Marsden, who lost his battle with cancer on 21 September 2010. As Co-Chair of the Scientific Program Committee for ICIAM 2011 and a member of the Steering Committee, Prof. Marsden’s influence and imprint was strongly felt in the structure and scientific content of the Congress. His enthusiasm and knowledge was deeply missed by his colleagues at ICIAM 2011. To honour Prof. Marsden and the contributions he made to ICIAM 2011 and the scientific community, a series of special activities were held at the Congress to recognize his work, including a Memorial Lecture by Alan Weinstein, University of California, Berkeley, followed by a reception and a series on minisymposia inspired by Jerry’s research.

You may wish to visit the Congress website <http://www.iciam2011.com/> to access

- the Invited Speaker presentations
- the Congress photos
- ICIAM 2011 in the News
- ICIAM 2011 TV!

Finally, I would like to thank all the people who helped to organize the Congress, most of whom are listed on the webpage <http://www.iciam2011.com/images/stories/ICIAM2011/committees.pdf>. They ensured that the Congress highlighted the most recent advances in applied and industrial mathematics.
Reports from the Society

Pictures from ICIAM

CAIMS Award Winners

Jorge Moré, Nassif Ghousoub, Jacques Bélair, and Nick Trefethen

Arvind Gupta

Julian Frigaard - Future Mathematician?
Reports from the Society

Mark Lewis, CAIMS • SCMAI
plenary lecturer at ICIAM

Jianhong Wu and Ian Frigaard

Jacques Bélair, Michael Ward
and Jianhong Wu

Jianhong Wu, Alejandro Adem,
Adam Oberman and Jacques Bélair

Jianhong Wu, Bob Russell
and Jacques Bélair
**2011 CAIMS•SCMAI Research Prize**
by Michael Mackey

The CAIMS•SCMAI Research Prize Committee faced a difficult decision this year, but finally awarded the prize to Prof. Michael Ward of the University of British Columbia. He was cited for “significant successful combination of singular perturbation techniques and numerical methods to analyze boundary-value problems arising in a wide range of applied fields”. The award consists of a prize of $1,000 and a commemorative plaque that is presented at the CAIMS•SCMAI Meeting. Prof. Ward also presented his Prize Lecture entitled “An Analysis of The Stability and Dynamics of Localized Spot and Stripe Patterns for the Gray-Scott Model” at the ICIAM meeting in Vancouver on 21 July, 2011.

**2011 CAIMS•SCMAI Arthur Beaumont Distinguished Service Award**
by Jianhong Wu

The Arthur Beaumont Distinguished Service Award is presented to Professor Robert D. Russell of Simon Fraser University, in recognition of his outstanding contributions and service to Applied Mathematics in Canada and for the tireless, strong passion, commitment, vision and exemplary leadership he has provided for CAIMS•SCMAI since its inception.

**2011 CAIMS-Mprime Industrial Mathematics Prize**
by Michael Lynch

The 2011 CAIMS-Mprime Industrial Mathematics Prize has been awarded to Professor Ian A. Frigaard, University of British Columbia for distinguished contributions to the theory of dynamics of non-Newtonian fluids as well as industrial applications using mathematical modelling for oil well construction. The committee was impressed with his well balanced CV between fundamental and applied research. He is an excellent example for the new generations of Canadian applied mathematicians and scientists. The award consists of a cash prize of $1,000 and a commemorative plaque that was presented at ICIAM in Vancouver in July. Professor Frigaard delivered a plenary lecture at the meeting as part of the award ceremony.
2010 CAIMS·SCMAI Cecil Graham Doctoral Dissertation Award
by Jianhong Wu

11 nominations were received, the nomination processing and selection involved Professor JF Williams and three Panel members: Professors Mary Pugh, Miguel F. Anjos and Pauline van den Driessche. The President of CAIMS also assisted in the coordination of the selection process.

The Panel was extremely impressed by the high quality of the nominations, and it was a very difficult task to make a final decision. The discussions were guided by the instruction “Judging will be on the basis of the level of originality in the ideas and techniques, the possible applications and their treatment, and the potential impact on science and engineering.”

The Panel decided that Elsa Hansen (supervised by Troy Day) at the Department of Mathematics and Statistics, Queen’s University; and David Titley-Peloquin (co-supervised by X.-W. Chang & Chris Paige) at the Department of Computer Science, McGill University will share the 2011 Cecil Graham Doctoral Dissertation Award.

The theses titles are “Applications of Optimal Control Theory to Infectious Disease Modeling” (Elsa Hansen) and “Backward Perturbation Analysis of Least Squares Problems” (David Titley-Peloquin). Both winners will be invited to present their work in the 2012 Annual meeting.

2011 CAIMS/PIMS Early Career Award in Applied Mathematics
by Bud Homsy

For outstanding research contributions in the analysis and numerical solution of nonlinear PDEs, the CAIMS/PIMS Early Career Award in Applied Mathematics has been awarded to Prof. Adam Oberman of Simon Fraser University.

Short Bio: Adam Oberman is an exceptional researcher who ranks among the top young applied mathematicians in the world today. Oberman brings his abilities as a mathematical analyst and computational scientist to bear on some of the most difficult and timely problems in nonlinear PDEs. He has made fundamental contributions to an impressively diverse set of problems in this field, including numerical methods for nonlinear PDEs, numerical solvers for the Monge-Ampere equation, and numerical homogenization. His work is having a profound influence on a number of problems in mathematical analysis and numerical computing.

Prof. Oberman obtained his PhD from the University of Chicago in 2001. He
was an R. H. Bing Instructor of Mathematics at the University of Texas at Austin from 2001 to 2004. He was twice Second Prize Winner for the Leslie Fox Prize in Numerical Analysis (2002 and 2005) and recently won the 8th SIAM Monroe H. Martin Prize for 2011. He is currently Associate Professor of Mathematics at Simon Fraser University.

The award consists of a cash prize of $1,000 and a commemorative plaque that was presented at the CAIMS Annual Meeting in Vancouver in July 2011. Prof. Oberman delivered an invited lecture at the meeting as part of the award ceremony.

CAIMS•SCMAI 2012 Election: Call for Nominations

by Sharene Bungay

CAIMS•SCMAI will be holding an election next winter (March 2012) for:

One Member-at-Large on the Board of Directors
to fill the position to be vacated by Nicholas Kevlahan.

All members of CAIMS•SCMAI are invited to suggest names of candidates for this office. Nominations should reach the CAIMS Secretary, Sharene Bungay <sharene@mun.ca> by January 20, 2012.
CAIMS·SCMAI 2012: Call for Proposals

We are pleased to inform you that the 2012 CAIMS·SCMAI Annual Meeting is scheduled for June 24–28, 2012 at the Fields Institute in Toronto. The themes of the meeting, which will be held in conjunction with the biennial Canadian Symposium of Fluid Dynamics (CSFD), are:

1. Applied Analysis (including Dynamical Systems).
   Organizers: Pietro-Luciano Buono (UoIT) and Michael Ward (UBC)
   Organizers: Ray Spiteri (Saskatchewan) and Buks van Rensburg (York)
   Organizers: Siv Sivaloganathan (Waterloo) and Pauline van den Driessche (UVic)
   Organizers: Matt Davison and Adam Metzler (UWO)
5. Fluid Dynamics.
   Organizers: Ian Frigaard (UBC), Richard Karsten (Acadia) and Bartosz Protas (McMaster)

The Organizers of the meeting are Abba Gumel (Manitoba), Huaxiong Huang (York) and Nilima Nigam (SFU), together with the Scientific Committee involving:

- Pietro-Luciano Buono (UoIT)
- Ian Frigaard (UBC)
- Richard Karsten (Acadia)
- Bartosz Protas (McMaster)
- Buks van Rensburg (York)
- Ray Spiteri (Saskatchewan)
- Michael Ward (UBC)
- Matt Davison (UWO)
- Michael Haslem (York)
- Adam Metzler (UWO)
- Mary Pugh (Toronto)
- Siv Sivaloganathan (Waterloo)
- Pauline van den Driessche (UVic)
- Huaiping Zhu (York)

Members are invited to submit proposals for minisymposia and contributed talks. Details are available on the conference website: <http://www.fields.utoronto.ca/programs/scientific/11-12/CAIMS_SCMAI/>. We look forward to seeing you in Toronto next June.
The Weird New Fourth Phase of Water ... and You.

Prof. Gerald H. Pollack Gives the 2011 Nerenberg Lecture

by Christopher Essex

Water is ubiquitous, and so too it seems are extraordinary scientific claims about it. From the fear that the world’s water might polymerize (polywater) to the weird claims of “water memory,” basic water research has had a colourful history.

But these strange historical claims distract from just how weird and amazing water actually is. Consider the stunning experiment where a bridge of liquid water is suspended in space between two beakers at different potentials. While school children learn that water has three phases, the 2011 Nerenberg Lecturer, Dr. Gerald Pollack, believes he has uncovered what appears to be a fourth phase for water. From his fascinating experimental results, this phase occurs next to water-loving (hydrophilic) surfaces. It is surprisingly extensive, projecting out from the surface by up to millions of molecular layers.

This fourth phase is charged, while the water just beyond is oppositely charged, making a natural battery that is observed to do small amounts of work. The battery seems to be charged by light. Thus, water can receive and process electromagnetic energy drawn from the environment—much like plants. This weird property has implications for fields from weather and green energy to biological issues such as the origin of life, transport, and osmosis. It also helps explain other better-known anomalous properties of water.

Gerald Pollack is professor of Bioengineering at the University of Washington. His interests have ranged broadly, from biological motion and cell biology to the interaction of biological surfaces with aqueous solutions. His 1990 book, Muscles and Molecules: Uncovering the Principles of Biological Motion, won an

Professor Pollack linking the structure of eddies to the Structure of the anomalous layer in water that they originate from.
“Excellence Award” from the Society for Technical Communication; his more recent book, Cells, Gels and the Engines of Life, won that Society’s “Distinguished Award.” He has an honorary doctorate from Ural State University in Ekaterinburg, Russia, is an Honorary Professor of the Russian Academy of Sciences. Pollack is a Founding Fellow of the American Institute of Medical and Biological Engineering and a Fellow of both the American Heart Association and the Biomedical Engineering Society. He is also Founding Editor-in-Chief of the journal, WATER, and has recently received an NIH Transformative Science Award.

Organized by Western’s Department of Applied Mathematics, the Nerenberg Lecture is named after the late professor Paddy Nerenberg and is intended to honour his appreciation for the democracy of ideas.
Activities at the Fields Institute

Thematic programs:

- 2011 Fall: Discrete Geometry and Applications
- 2012 Winter/Spring: Galois Representations
- 2012 Winter/Spring/Summer: Inverse Problems and Imaging
- 2012 Fall: Forcing and its Applications
- (Ongoing): Operator Algebra

Focus programs:

- 2012 May 14–June 12: Mathematical Modeling of Neurological Disease from Cellular Perspectives
- 2012 July: Geometry, Mechanics and Dynamics, the Legacy of Jerry Marsden
- 2012 August–September: Whitney Problems
- 2013 July: Noncommutative Distributions in Free Probability Theory

More information at <www.fields.utoronto.ca/programs/scientific/>

Some specific future activities which may be of interest to members of the CAIMS (held at the Fields Institute unless otherwise stated):

February 22–24, 2012: Workshop on Surfactant Driven Thin Film Flows
March 8–9, 2012: Workshop on Coordinated activity in physiology: measures, concepts and controversies Supported by the Centre for Mathematical Medicine at Fields
April 11–13, 2012 (proposed): Workshop on Recent Progress in Quantum Algorithms to be held at the University of Waterloo and the Perimeter Institute
May 3, 2012 – 6:00 p.m.: Keyfitz Lectures in Mathematics and the Social Sciences by Stephen Fienberg at Carnegie Mellon University

There are also regular seminars, such as

- Actuarial Science & Financial Mathematics Group Meetings
- Centre for Mathematical Medicine Seminar Series
- Colloquium/Seminar in Applied Mathematics
- Infectious Disease Epidemiology Afficionados
News from the Math Institutes

- Physics/Fields Colloquium
- Toronto Quantum Information Seminar
- PRMIA Risk Management Seminars
- Fields Industrial Optimization Seminar
- Seminar Series on Quantitative Finance

Links to these seminars can be found at <www.fields.utoronto.ca/programs/scientific>.

Deadlines and information for proposals and financial assistance can be found at <www.fields.utoronto.ca/proposals/>.

For more information on all activities at the Institute, please see <www.fields.utoronto.ca/programs/scientific/>.

To be informed directly of upcoming Scientific Activities, please subscribe to our emailing list at <www.fields.utoronto.ca/maillist/>.

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News from the Centre de recherches mathématiques

by Chantal David

After directing the CRM 2004 to 2008, Francois Lalonde (CRC in Symplectic Topology at Université de Montréal) just returned for a four-year new mandate from June 2011 to June 2015. The CRM is presently hosting the thematic semester on Quantum Information, with a group of organisers which are among the leaders in the field. This will be followed by a thematic program on Geometric Analysis and Spectral Geometry in the Spring 2012, and then by the thematic year on Moduli Spaces, Extremality and Global Invariants. Then the theme year Mathematics of Planet Earth 2013 will take over, organised by Christiane Rousseau of Université de Montréal and an impressive group of mathematicians, economists, environmentalists, etc. This project involved the thirteen North American Institutes.

The CRM is now the host of a new Unite mixte internationale (UMI). L’UMI-CRM is the twenty-fifth UMI of the CNRS (Centre National de la Recherche Scientifique), including all fields and all countries, and the seventh in mathematics. The inauguration ceremony took place at the CRM on October 4, 2011, and the convention was signed by Joseph Hubert, Vice Rector Research at Université de Montréal, and Alain Fuchs, president of the CNRS.

The CRM solicits proposals for future research programmes. Proposers are invited to complete the form available at <http://www.crm.umontreal.ca/en/act/form/propositions_an.shtml> and send it electronically. Alternatively, one may instead print this page, fill out the form and send it, either by post or by fax, to the Director of the CRM <director@CRM.UMontreal.CA>. The proposals requesting financial support
from Mprime must be made in accordance with the Mprime deadlines, i.e, January 15th, April 30th and September 10 of each year.

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**News from Pacific Institute for the Mathematical Sciences**

by Karen Manders

**Our community**

In July 2011, PIMS welcomed two new site directors. Nils Bruin and Peter Hoff will bring new energy and expertise to our sites at Simon Fraser University and the University of Washington. The PIMS International Graduate Training Centre (IGTC) also underwent a change in leadership with Dan Coombs (UBC) taking over from Mark Lewis (U of Alberta) who had held the directorship since the Centre’s inception in 2007. PIMS also welcomed the University of Northern British Columbia as an affiliated member.

**Mathtube.org**

In October, PIMS launched a new multimedia resource, www.mathtube.org which gives users easy access to mathematical seminar and lecture materials including videos, notes and slides. This new resource is unique because it allows users to view slides and video at the same time, but also independently from one another. mathtube.org was created to meet the increasing demand of requests we were receiving to see footage of past PIMS lectures. mathtube.org gives global exposure to PIMS events and offers those who attended our lectures the chance to go back and review a particular talk; or those who didn’t, a chance to see what they’ve missed. This new resource also gives added value to conference organizers and participants, as well as a great forum to see world-class speakers from all areas of mathematics and applied mathematics. These materials are an important resource and include contributions from some of the world’s most distinguished contemporary mathematicians. mathtube.org includes lectures from a very wide range of areas of the mathematical sciences and videos from education conferences such as ‘Changing the Culture’ which explores topics in mathematics education.

**Scientific events**

Across all 8 PIMS sites, 2011 has been a busy year with the most activity taking place in the summer. The largest of which was the Applied Mathematic Perspectives thematic program which was a satellite event to the ICIAM 2011 conference in Vancouver; this event attracted over 250 participants from all around the world. Seven workshops targeted diverse areas of applied mathematics including imaging, fluid mechanics, delay differential equations, numerical solutions of differential equations, Ricci flows and reproducible research.

Our Collaborative Research Groups have also been very active. PIMS currently
has three active groups, L-Functions and Number Theory, the Mathematics of Quantum Information, and Applied and Computational Harmonic Analysis.

The CRG in Number Theory and L-functions had four major events in Spring-Summer 2011. Analytic Aspects of L-functions, one of the CRG’s flagship events, featured lecture series by three number theory celebrities: Brian Conrey (AIM), Ram Murty (Queens), and Kanaan Soundararajan (Stanford). In their lectures, these experts succeeded in blending exposition at the graduate student level with emphasis on contemporary themes and state-of-the-art results in the field. These lecture series were complemented by invited talks by many researchers with international reputations.

The PIMS CRG for the Mathematics of Quantum Information, established in 2010, comprises quantum information groups at the Universities of British Columbia, Calgary, Washington and Simon Fraser University. The group is quite active with team members visiting each other, plus attracting top visitors. The CRG works at the forefront of mathematical quantum information with several significant results. These advances include non-randomized construction of highly entangled subspaces, a proof that the Affleck-Kennedy-Lieb-Tanaki states in condensed matter physics are a universal resource for quantum computation by local measurement and a closed formula for relative entropy of entanglement in all dimensions.

The CRG on Applied and Computational Harmonic Analysis held two events in 2011: an international conference and a summer school. The International Conference on Applied Harmonic Analysis and Multiscale Computing welcomed 112 participants from 12 countries with over 60 presentations. The summer school following featured tutorial lectures given by: Steve Smale, Ding-Xuan Zhou, Zuowei Shen, and Bin Han. The CRG has also hosted many distinguished visitors from all around the world.

Industrial activities
The PIMS/Shell lectures in Calgary continue to be successful, attracting industry professionals to hear talks on topics such as optimal investment for an insurance company, mathematics and paleontology, and medical imaging and applied math. There is an upcoming Industrial Short Course on Monte Carlo Methods for Quantitative Finance, in February in Vancouver. This is a course for risk managers, quantitative analysts and others who want to learn how to make use of Monte Carlo and related techniques.

Education and outreach
PIMS education coordinators have also been busy with several Math Manias, Math Fairs and camps taking place in schools and universities across Western Canada. This summer saw PIMS UBC form a partnership with the UBC First Nations House of Learning to host the ‘Emerging Aboriginal Scholars Summer Camp’, a five week long camp for Aboriginal students with academic, cultural and work
experience components. A short video about this camp was produced and is available on mathtube.org. The University of Alberta also hosted the successful Alberta Summer Mathematics Institute.
See <www.pims.math.ca> for more details.

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**Two weeks at WATERLOO**

**A Summer School for Undergraduate Women in Math**

**August 12–25, 2012**

This summer school will provide an opportunity for up to sixteen outstanding female undergraduate mathematics students, from across Canada, to study mathematics in an intense two week immersion. The aim is to encourage and inspire these gifted women to continue on to graduate work in mathematics. The program will provide both enrichment of the undergraduate curriculum and a research component, in a collaborative environment.

The students will take two mini courses, taught by Prof. Matilde Lalin (University of Montreal) and Prof. Gail Wolkowicz (McMaster University). Four female guest speakers will talk about their work in mathematically-related fields and visits will be made to businesses and institutions which employ mathematicians.

The women will be housed at the University of Waterloo. The students’ accommodation, meals and travel costs within Canada will be covered, subject to availability of funds.

The summer school is open to female undergraduate students studying mathematics or a related discipline at a Canadian university, with at least one year of studies remaining in their program. Canadians and permanent residents of Canada studying outside Canada are also eligible. Please encourage talented students from your institution to apply. Applications for this very selective program are due January 31, 2012. More information and an on-line application form can be found on the website, <http://women.math.uwaterloo.ca/Summer_School>

We are grateful to CAIMS for agreeing to be one of the sponsors of this event.
The Department of Mathematics and Statistics at McGill University invites applications for a tenure-track position in applied mathematics. While appointments are expected to be made at the Assistant Professor level, more senior applicants would be considered.

The appointment is expected to be in the broad area of differential equations and scientific computing. Applicants should have expertise in both analytical and computational aspects, and an active interest in problems driven by applications. Candidates must have a doctoral degree at the date of appointment and a strong background in mathematics. They are expected to have demonstrated the capacity for independent research of excellent quality. Selection criteria include research accomplishments, as well as potential contributions to the Department’s educational programs at the graduate and undergraduate levels.

Applications should be made through MathJobs.Org (Position ID: McGill-APNUM) and must include a curriculum vitae, a list of publications, a research outline, a teaching statement which includes an account of teaching experience, and at least four references (with one addressing the teaching record). Candidates are also encouraged to provide web links for up to three selected reprints or preprints, or to upload them to MathJobs.Org.

Candidates must ensure that letters of reference are submitted (preferably through mathjobs.org, though in exceptional circumstances they may be mailed to Professor R. Choksi, Applied Mathematics Search Committee, Dept. of Mathematics and Statistics, McGill University, 805 Sherbrooke St. W. Montreal, QC H3A 2K6, Canada).

To ensure full consideration, complete applications including letters of reference should be received by January 6th 2012, but later applications may be considered.

McGill University is committed to equity in employment and diversity. It welcomes applications from indigenous peoples, visible minorities, ethnic minorities, persons with disabilities, women, persons of minority sexual orientations and gender identities and others who may contribute to further diversification. All qualified applicants are encouraged to apply; however, in accordance with Canadian immigration requirements, priority will be given to Canadian citizens and permanent residents of Canada.