



Newsletter

Summer 2007

Towards Independent Funding



Since it was founded in 1996, AARMS has gone through a rapid and continuous evolution. From its early days as a clearing house for the coordination of approaches to the Mathematical Institutes for support for regional events we have arrived at the point today where we have our own stable

budget, funded by the Institutes and the Universities, and a membership which includes nearly every university with a graduate program in mathematics in Atlantic Canada. Such rapid growth is evidence of the fact that AARMS is both needed and valued in our region; and it leads us to take the next step in creating a regional organization that can meet the needs of our community and represent our achievements on the national and international stage.

On the first of May AARMS submitted a Letter of Intent to NSERC to apply for funding under the Major Resource Support (MRS) program. The vision that we have laid out is for an organization which reflects our strengths in the mathematical sciences and which provides support for our activities proportionate to what the rest of Canada receives through the Institutes. We propose a larger budget, giving us the ability to increase our support in the areas in which we are currently active and to move into new activities in both educational and industrial outreach. We also propose a role for provincial governments, private sector partners, and a larger role for the major universities. The feedback we have received so far from our meetings with these stakeholders has been positive.

A full proposal will be due in the autumn and we should hear the results in the spring of 2008. There may not be much to report between now and then, but if there is any news you will find it on the website (www.aarms.math.ca) and here in our newsletter (www.aarms.math.ca/news).

Jonathan Borwein

The First Year at the AAC



The Atlantic Algebra Centre (AAC) began its work on September 1, co-sponsored by AARMS and Memorial University of Newfoundland (MUN).

On Sept 25 - Oct 6, Professor A. Regev of Weizmann Institute of Science (Israel) delivered at MUN a mini-course entitled "Representation of the Symmetric Group and Related Topics of Analysis and Combinatorics". Our second mini-course "Coadjoint Action of Algebraic Groups and Modular Representation Theory" by Professor A. Premet of University of Manchester will be delivered on May 20-27, 2007. In addition to our traditional Algebra Seminar, a new series of AAC Colloquium Talks was launched last Fall. These talks were delivered by A. Regev (Israel), V. Kharchenko (Mexico), M. Beattie (Mount Allison) and R. Smirnov (Dalhousie).

AAC also partially supported the postdoctoral research of Dr. M. Tvalavadze and provided a top-up to the graduate support of PhD students J. McGraw and X. Yang. In March we held an undergraduate Algebra Competition for the students of Atlantic Provinces.

Currently we are organizing the International Workshop "Groups, Rings, Lie and Hopf Algebras II" at the Bonne Bay Marine Station of MUN in Gros Morne National Park, August 13-17, 2007. We will have around 30-40 participants from several countries, including Belgium, Canada, Spain, UK and USA. Our prominent invited speakers will deliver lectures on the most recent results in the entitled areas.

Our special thanks to the Department of Mathematics and Statistics and the Faculty of Science of MUN who additionally provided us with the room and modern equipment.

Please visit our website for more information (www.math.mun.ca/~aac).

Yuri Bahturin

News

A Course on the Web Graph

A Preview of the first book in our new series

The internet affects many aspects of our lives, such as how we store and retrieve information, conduct business, and communicate. For example, information is no longer only stored in printed form, but is represented on-line via a complex set of interconnected web pages. The *web graph* has vertices representing web pages, with edges corresponding to the links between pages. The web graph is a real-world network which has undergone intensive study in the last decade by theoreticians and experimentalists alike. Current research on the web graph focuses on designing and analyzing models for its evolution, and on search algorithms that exploit the link structure in the web.

The study of the web graph, or *internet mathematics* as it is now often called, is an active field of study. The forthcoming book "A course on the web graph" will supply a solid mathematical introduction to internet mathematics, and will encourage interest in an emerging and fascinating area of graph theory and theoretical computer science.

The book resulted from lecture notes for an AARMS Summer School graduate course *Massive Networks and Internet Mathematics* taught in July 2006 at Dalhousie University in Halifax. A version of the course was taught once before at Wilfrid Laurier University in Waterloo. As such, the book will be appropriate for graduate students or keen undergraduate students in mathematics, computer science, or physics. The text will also be useful to professional mathematicians or computer scientists interested in learning more about the web graph and graph theory in general. The book should appear later this year.

Anthony Bonato

The Atlantic Shared Curriculum Initiative (ASCI)

ASCI is a pilot program of graduate-level courses in mathematics involving all three founding universities (Dalhousie, Memorial and UNB) that we hope to run in autumn 2008. The courses will be delivered via Access Grid Technology with students distributed amongst the three locations. The project is a testing ground for a concept of course delivery that could bring substantial savings on the delivery of standard courses where there are small numbers of students at each site. By collaborating on the standard courses, we hope to enable the universities to offer more local courses in their own areas of specialization.

But there is more at work in the ASCI project than just finding common ground and gaining

efficiency. We are also taking a step forward in developing our expertise in collaborative technology. The D-Drive lab at Dalhousie University, directed by Jonathan Borwein, is a world leader in this area, and having this expertise at the heart of AARMS enables AARMS to play a unique role on the international stage.

Over the summer NSERC USRAs at Dalhousie, MUN and UNB will organize and operate a distributed summer seminar series to test and refine the use of systems and technologies for the project. The summer series is sponsored in part by NSERC Atlantic.

Bienvenue à l'Université de Moncton

The latest addition to the AARMS Community is l'Université de Moncton. We welcome both the academic and linguistic richness that they will bring to AARMS.

Report on the East Coast Combinatorial Conference

There is a vibrant combinatorial community in Atlantic Canada. The annual East Coast Combinatorial Conference provides an opportunity for researchers and students to meet to exchange ideas and to discuss topics of mutual interest. Recent conferences have been hosted by UNB Fredericton in 2005 and by UPEI in 2006. This year the conference was held April 18 and 19 at Mount Allison University in Sackville, NB. The participants all appreciated the opportunity to network and to see what others in the region are doing and it would not be surprising if there are some new collaborations as a result of this meeting.

The conference had a total of 30 participants: 19 faculty members, 1 post-doctoral fellow, 7 graduate students and 3 undergraduate students. Participants came from both mathematics and computer science departments from 9 Atlantic universities: Memorial, Dalhousie, St. Mary's, Cape Breton, St. Francis Xavier, UPEI, UNBF, UNBSJ and Mount Allison.

The plenary speaker was Michael Plummer of Vanderbilt University. The other invited speakers were Neil Calkin, Clemson University (thanks to the AARMS Distinguished Lecturer Program), Pat Morin, Carleton University and David Pike, Memorial University. Their talks covered a wide spectrum of combinatorial topics. In addition, there were 12 contributed talks, 4 by graduate students.

Catharine Baker

People

Neil Calkin: AARMS Distinguished Lecturer



Neil Calkin, our first AARMS Distinguished Lecturer of 2007, spent the winter term on sabbatical from Clemson University, visiting Jon Borwein's D-Drive lab in the Faculty of Computer Science at Dalhousie University. Despite breaking his right arm early in the visit, he managed to give an unusually large number of talks: three at Dalhousie, and single talks at each of Acadia University, Mount St Vincent University, St Francis Xavier University and St Mary's University. He was also an invited speaker at the East Coast Combinatorics Conference at Mount Allison University, and contributed to a session at the D-Drive workshop on Mathematical Knowledge Management. Abstracts from these talks can be found on the AARMS website.

His talks ranged from problems relating linear algebra and combinatorics, the behaviour of sequences defined as weighted averages of earlier terms, a novel (and computationally effective) proof of the countability of the rationals, and a report on his experiences introducing undergraduates to research.

He also co-taught a course in experimental mathematics with Jon Borwein, based on their forthcoming book (with Bailey, Girgensohn, Luke and Moll) *Experimental Mathematics in Action*.

Dr. Calkin, who was educated at Cambridge University and received his Ph.D. from the University of Waterloo in 1988, taught at Carnegie Mellon University and the Georgia Institute of Technology, before taking his current position at Clemson University. His interests especially include (but are not limited to) algebraic, analytic and probabilistic methods in combinatorics and number theory: as a co-founder of the Electronic Journal of Combinatorics he has maintained an interest in issues related to electronic communication in mathematics. He is currently in his sixth year of running a National Science Foundation supported Research Experience for Undergraduates.

Dr. Calkin, whose father was born and raised in New Brunswick, enjoyed tremendously the hospitality of the Maritimes, and looks forward to visiting the region again in the future. Those of us who have had the opportunity to spend some time with Neil hope he comes back soon.

Maureen Tingley and the NB Common Math Exam

At UNBF, Maureen Tingley has been leading a project to develop a common grade 12 New Brunswick assessment exam in mathematics. The goals of the project are simple: to provide a forum where teachers can participate in preparation of an exam (and grading scheme) which they consider appropriate to use as the final exam in Math 120/122; to provide feedback to students about their readiness for post-secondary mathematics and to provide feedback to teachers.

In February of this year, a two-day workshop was held at UNBF to prepare exams. 16 teachers attended, and prepared papers which were then edited and type-set at UNBF. Teachers had opportunities to peruse the final drafts at two events: the Maritime marking session for CEMC (Waterloo) competitions on April 27; and at the Subject Council Day in Miramichi on May 4. As in 2006, the papers have received an enthusiastic response.

The exams will be written in schools in June, and will be marked by teachers using a common grading scheme. Students who score at least 70% qualify for exemption from mathematics placement tests at UNB (both campuses), Mount Allison, and Saint Mary's University.

Rebecca Hammond - AARMS PDF



Our Postdoctoral Fellowship Competition this year was highly competitive, with nine candidates from four universities. With such a healthy level of interest we decided to stretch our budget to award two PDFs if the Scientific Review Panel could indicate two clear front runners. In the end, however,

there was one clear and eligible winner, Rebecca Hammond, who will take up her Fellowship at Acadia.

Rebecca obtained her Bachelor's degree from Smith College in 1989. She completed a Master's in Mathematics at McGill University in 1993 and a Ph.D. in Applied Mathematics at the University of Washington in 2003. Her research interests are in mathematical models of biological and environmental phenomena. Rebecca Hammond is currently working with and will be supervised by Richard Karsten and Holger Teismann at Acadia. We would like to welcome Rebecca to the AARMS community and hope she has a productive time at Acadia.

Recent and Upcoming Events

Black Holes VI

Organizer: Jack Gegenberg

Location: White Point Beach Resort, Nova Scotia

Date: May 12-16, 2007 More Information: Jack Gegenberg (geg@unb.ca)

12th Canadian Conference on General Relativity and Relativistic Astrophysics

Organizer: Jack Gegenberg

Location: University of New Brunswick, Fredericton, New Brunswick

Date: May 17-20, 2007 More Information: Jack Gegenberg (geg@unb.ca)

Session at the Statistical Society of Canada (SSC) Annual Meeting

Organizer: Brajendra Sutradhar

Location: Memorial University of Newfoundland, St. John's, Newfoundland

Date: June 10-13, 2007 More Information: Brajendra Sutradhar (bsutradh@math.mun.ca)

Workshop on Noncommutative Geometry

Organizer: Dan Kucerovsky

Location: University of New Brunswick, Fredericton, New Brunswick

Date: June 11-15, 2007 More Information: Dan Kucerovsky (dan@erdos.math.unb.ca)

AARMS/ACENET Summer Workshops and Conference in High Performance Computing

Organizers: Hugh Chipman, Richard Karsten

Location: Acadia University, Wolfville, Nova Scotia

Date: July 9-14, 2007 More Information: Hugh Chipman (hugh.chipman@acadiau.ca)

International Workshop on Groups, Rings, Lie and Hopf Algebras II

Organizer: Yuri Bahturin

Location: Bonne Bay Marine Research Station, Memorial University, Newfoundland

Date: August 13-17, 2007 More Information: Yuri Bahturin (yuri@math.mun.ca)

Key Dates

May 12-16, 2007	Black Holes VI
May 17-20, 2007	General Relativity Conference
June 10-13, 2007	SSC Annual Meeting
June 11-15, 2007	Non Commutative Geometry Workshop
June 30, 2007	Deadline for reports on renewing PDFs

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"One man excels in eloquence, another in **AARMS**." - Virgil