



Atlantic Association for
Research in the
Mathematical Sciences

Annual Report

2006

Preface

2006 was a year of consolidation and growth for AARMS as the directorship moved from Memorial to Dalhousie after several years of able stewardship by Hermann Brunner. Membership grew from four to eight universities with the addition of Saint Mary's, Mount Allison, UPEI, and Saint FX and we anticipate further growth in 2007. As described below we were able to support, in part or whole, a gamut of high quality research activities, a much appreciated summer school, a modest PDF programme, and various other outreach initiatives. These are described briefly below and more details can be found on the revamped website at www.aarms.math.ca and in the regular newsletters which are also stored on the website.

Another exciting new initiative was the launch of an AARMS monograph series, based on the summer school, to be published by the American Mathematical Society. It already has four titles at various stages of preparation. Further, AARMS has signed exchange agreements with several other Institutes and has embraced the use of technology as appropriate: the executive has started to hold video meetings over the AccessGrid. We are also launching an Atlantic Shared Curriculum Initiative about which you may expect to hear more in upcoming newsletters.

In a nutshell, AARMS is presently able to provide significant support to the Mathematical Sciences throughout Atlantic Canada and is constrained only by its limited budget of roughly \$200,000 per annum. To redress this, the Board has approved preparation of an application to NSERC and to regional sources which if successful would provide an annual budget in excess of \$500,000. At that level we would be able to fund a more realistic PDF programme, to modestly expand the summer school, and would be able to proactively support the best research in the region rather than functioning as we must now as a sympathetic responsive agency with very limited funds. We will also be able to undertake significant industrial and educational outreach activities of the kind that can really make a difference in Atlantic Canada.

Finally, I should like to acknowledge the energy and work of many people but especially of Richard Wood as Deputy Director and David Langstroth as AARMS administrator.

Jonathan Borwein
AARMS Director
February 15, 2007



Income and Expenditure Account 2006

<u>Income</u> ¹	\$	\$	
Carried forward from 2005			5,869
Mathematical Institutes			70,000
Universities			119,500
For Summer School			<u>7,922</u>
Total Income			203,291

Expenditure

Summer School			
Instructors ²	28,304		
Students ³	23,527		
Other ⁴	<u>13,597</u>		
		65,427	
Workshops and Events ⁵		40,176	
PDF Program ⁶		46,500	
Director's PDF		9,602	
Distinguished Lecturer Series		4,540	
Book Series		541	
Administrator Salary		10,377	
Travel		4,840	
Office Expenses		<u>6,053</u>	
Total Expenditure			<u>188,056</u>

Surplus: Income Less Expenditure **15,235**

note: some expenses accrued in 2006 had not been paid
by the end of the accounting period; thus the surplus appears larger than it is in reality

Notes

1. For a breakdown see Appendix 1
2. Travel, Accommodation and stipends of \$5,000 each
3. Residence and Meals
4. Texts and course materials, promotion, secretarial, computing and hospitality
5. See Appendix 2
6. See Appendix 3



Balance Sheet

December 31, 2006

Assets

	\$	\$
Surplus from Operations (Income less expenditure)		15,235
Accounts Receivable ¹		
CRM	45,000	
Fields	30,000	
PIMS	45,000	
MITACS	10,000	
Acadia	5,000	
Cape Breton	1,000	
Dalhousie	50,000	
Memorial	30,000	
Mount Allison	0	
Saint Francis Xavier	0	
Saint Mary's	1,000	
UNB	30,000	
UPEI	1,000	
	<u>248,000</u>	
Total Assets		263,235

Liabilities

Accounts Payable ²		
Summer School	70,000	
Postdoctoral Fellowships	48,000	
AARMS Director's PDF	16,000	
Scientific Activities ³	69,668	
AARMS Book Series	3,000	
Administrator Salary	10,000	
Information Structuring	4,000	
Distinguished Lecturers	5,000	
AARMS Poster	3,000	
Travel and Office expenses	8,000	
	<u>236,668</u>	
Unallocated funds - for AARMS activities		<u>26,567</u>
Total Liabilities		263,235

Notes

1. Fees due to be collected in 2007
2. Funding Commitments in 2007
3. Workshops, Conferences, Meetings, Atlantic Algebra Centre



Annual Accounts 2006

Appendix 1

Revenue Breakdown

Mathematical Institutes		
CRM	15,000	
Fields	30,000	
PIMS	15,000	
MITACS	10,000	
	<hr/>	70,000
Universities		
Acadia	5,000	
Dalhousie	50,000	
Memorial	30,000	
Mount Allison	2,000	
Saint Francis Xavier	1,000	
Saint Mary's	500	
UNB	30,000	
UPEI	1,000	
	<hr/>	119,500
For Summer School		
Surplus from 2005 Summer School	7,222	
Other sponsors ¹	700	
	<hr/>	7,921.65

Notes

1. Clearwater Foods, Dalhousie VP Academic, and sale of T-Shirts



Annual Accounts 2006

Appendix 2

Workshops and Scientific Events

Maureen Tingley Math Exam Project	2,000
East Coast Combinatorics Conference	1,676
Atlantic Algebra Centre	11,000
Canadian Undergraduate Math Conference	2,795
C2C Miniconference: Mathematics of Computation	329
APICS Sessions at CBU	4,489
Games at Dal Workshop	2,169
Atlantic Canada General Relativity Meeting	2,360
Atlantic Analysis Days	7,171
International Category Theory Conference	3,000
Numerical Analysis Workshop	3,130
Atlantic Community Math Network Conference	55
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total	40,176

Appendix 3

Postdoctoral Fellowships

Tobey Kenney	8000
Dansheng Yu	8000
Kia Dalili	8000
Sigbjorn Hervik	15000
Oliver Winkler	7500
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total	46,500

Report on Activities

AARMS Summer School

The AARMS Summer School took place at Dalhousie University from Sunday July 16 to Saturday August 12. Four courses were offered: Elliptic Curve Cryptography by Mark Bauer of Calgary, Massive Networks and Internet Mathematics by Anthony Bonato of Wilfrid Laurier, Algebraic Geometry by Rick Miranda of Colorado State and Introduction to Wavelet Theory by Anita Tabacco of Politecnico di Torino. Each course met for 90 minutes each day. There were 38 students altogether. Of these, 11 were from Dalhousie and the other 27 were from 7 Canadian Provinces and 6 other countries. Some students from farther afield (Turkey and Iran) were unable to come.

In addition to the formal lectures there were a number of social activities. These included a welcoming reception sponsored by the Vice President Academic on the day of arrival, a pizza lunch the following day, a barbecue with members of the CMS math camp, a bus trip to Lunenburg and dinner on the waterfront and a final farewell barbecue put on by the Graduate Students' Society on the last day of classes.

This "barebones" account of the programme does not convey the sense of excitement and the pleasure of learning which pervaded the department for the four weeks of the school. These were engendered by the hard work and dedication of the four instructors and the students. All indicated that it was a very well-worthwhile experience in a setting conducive to teaching and learning.

AARMS Postdoctoral Fellowship Program

In the 2006 competition, Postdoctoral Fellowships were awarded to:

1. Tobey Kenney – Dalhousie University, supervised by Robert Pare and Richard Wood.
2. Dansheng Yu – Saint Francis Xavier University, supervised by Zhou Ping.

The PDF awarded to Kia Dalili in the previous year (Dalhousie University, supervised by Sara Faridi) was continued for a second year, and a one-year PDF for Sigbjorn Hervik (Dalhousie University, supervised by Alan Coley), deferred from 2005, was begun in 2006.

AARMS Distinguished Lecture Series

There were two AARMS Distinguished Lecturers in 2006:

1. **Barbara Lee Keyfitz** (Fields Institute and University of Houston)
Topic: Multidimensional Conservation Laws – more questions than answers
Lectures at UNB, Memorial and Dalhousie Universities
2. **Terry Rockafellar** (University of Washington)
Topic: Approaches to Risk in Optimization under Uncertainty
Lectures at Dalhousie and Acadia Universities

Scientific Activities

The following conferences, workshops and scientific activities were funded or co-funded by AARMS in 2006:

1. **Atlantic Analysis Days**, Dalhousie University, January 20-21
Organizer: Jon Borwein
2. **East Coast Combinatorics Conference**, UPEI, April 1-2
Organizer: Shannon Fitzpatrick
3. **Atlantic Canada General Relativity Meeting** UNB, Fredericton, May 5-7
Organizers: A. Dasgupta, J. Gegenberg, R. Mckellar
4. **International Category Theory Conference** White Point, NS, June 25 – July 1
Organizers: D. Pronk, R. Dawson, P. Selinger
5. **Bluenose Numerical Analysis Day** Saint Francis Xavier University, June 23
Organizers: J. McNally, P. Keast, R. Karsten, R. Haynes, P. Muir
6. **Games-at-Dal 4** Dalhousie University, August 21-25
Organizer: Richard Nowakowski
7. **Atlantic Optimization Days** UNB, Fredericton, October 5-6
Organizers: David Bremner, Hugh Thomas
8. **APICS 2006: Special Session on Mathematical Modelling and Simulation**
Cape Breton University, October 14. Organizers: George Chen and Ronald Haynes
9. **APICS 2006: Special Session on Multivariate Statistical Analysis**
Cape Breton University, October 14. Organizer: Edmund Rudiuk
10. **Atlantic Community Math Network Conference** Acadia University, Nov. 25
Organizer: Jeff Hooper
11. **UNB Math Exam Project** University of New Brunswick, ongoing
Principal Investigator, Maureen Tingley

Reports from the above activities are lodged online and can be read at
<http://www.aarms.math.ca/events/past.php>

AARMS Monograph Series

The AARMS Monograph Series was established in 2006 to encourage lecturers at the AARMS Summer School to submit manuscripts based on their specialist courses. An agreement was signed with the American Mathematical Society (AMS) to publish these books with the AARMS logo in existing AMS series. Several past Summer School lecturers have shown an interest in writing a book, and an editorial board was created consisting of:

Jonathan Borwein (Dalhousie University)
Robert Dawson (Saint Mary's University)
Ron Fitzgerald (Math Resources Inc)
Dan Kucеровsky (University of New Brunswick)
Richard Wood (Dalhousie University)
David Langstroth (Dalhousie University)

External Affiliations

Informal Affiliations were set up with the Australian Mathematical Sciences Institute (AMSI) and the New Zealand Institute of Mathematics and its Applications (NZIMA). These are comparable mathematical organizations which also operate summer school programs. The goal of these affiliations is to explore sharing of expertise, knowledge and resources through a variety of exchanges and collaborations, both in person and through *Access Grid* technology.

Communications

In 2006 AARMS made a number of innovations in its communications strategies:

1. The logo was revamped to show the white fractal snowflake on a deep blue background, evocative of the presence of the sea in our region.
2. The website was redesigned and hosted at Dalhousie University, with a public face and a private page for the executive to share documents
3. The AARMS Newsletter was redesigned and distributed to the AARMS Community both electronically and on paper three times per year
4. An annual poster for 2006/2007 was designed and distributed to the AARMS community
5. Distance collaboration *Access Grid* technology from the D-Drive Lab was implemented for meetings of the regional executive and for presentations at the Atlantic Analysis Days.