



# Mathematical & Statistical Sciences

Spring  
2004



## Message from the Chair ATM Lau

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I would like to extend a warm welcome to our new academic staff, support staff, graduate students, post-doctoral fellows and visitors.

Dr. Cho-Jieh Chen arrived as of May 2003. He is an Assistant Professor in Actuarial Sciences. Dr. Vladimir Chernousov arrived in July 2003 as a Professor in Algebra.

Gary Ludwig and Robert Moody have taken retirement status as of July 1, 2003. They are on half-time appointments until June 30, 2005. Thanks to Bob and Gary for the many years of outstanding contributions to the Department.

The following colleagues were honored for their long service to the University of Alberta in a ceremony in 2003:

- H. Brungs - 35 years
- A. Rhemtulla - 35 years
- J. Muldowney - 35 years
- I. Baggs - 30 years
- B. Moodie - 30 years
- L. Guthrie - 25 years

Congratulations and thank you. Congratulations to Jacques Carrière who received an "outstanding paper award" by

the Canadian Institute of Actuaries at the 2003 Stochastic Modeling Symposium. The award came with a plaque and a cash prize.

Congratulations to Andy Liu who has been selected as the recipient of the 2003 of the Adiren Pouliot Award by CMS. The Adrien Pouliot Award is for individuals, or teams of individuals, who have made significant and sustained contributions to mathematics education in Canada. Andy was honored at the banquet of the CMS Winter Meeting in Vancouver in December 2003.

Andy Liu is also one of the three winners of this year's Deborah and Frankin Tepper Haimo Award of MAA created in 1991 for Distinguished College or University Teaching in Mathematics. Congratulations Andy.

I would like to thank the graduate students for coordinating the annual B-B-Q held at Hawrelak Park in the fall of 2003. The B-B-Q was wonderfully organized and over 150 people took part. I would also like to thank Rick for organizing the Christmas Party held at the Fantasyland Hotel, West Edmonton Mall on

December 12, 2003. It was attended by nearly 100 people.



## Associate Chair of Research

### K.C. Carrière

The Research Committee once again worked hard at providing peer-reviews for this year's NSERC applicants. Especially those who were new at NSERC grant applications were extremely appreciative of the feedback from the committee. However, the suggestions and comments from the committee led to much improvement for all. There were 18 applicants this year and we hope everyone the best of luck in the upcoming competition. On behalf of these applicants, I thank the members of the committee for their hard work.

The Awards committee also worked hard at nominating and encouraging faculty members of the Department for various awards and prizes this year. Many of these are still under review. At this time, we are happy to report that our nomination of Professor Anthony Lau for the UNIVERSITY PROFESSOR recognition became successful. It is the highest honour that the University of Alberta bestows on its faculty members and we are very proud that Professor Lau is to

be appointed in that position as of July 1, 2004. We are also happy to learn that Professor Yanping Lin is named a MaCalla Professor for 2004.

## Biostatistics Research Centre

### K.C. Carrière

Training Consulting Centre welcomed Ms. Irina Dinu as its new coordinator for the year 2004. The members of the Centre voted her among all of its current consultants as the best person for the job. We thank her for her acceptance to be the coordinator and wish her well. Also we wish the Centre continuing success in providing excellent training resources to the graduate students in our Statistics program and also in offering necessary statistical consultations to researchers who come to the Centre for help under Irina's leadership. We also acknowledge the out-going coordinator, Mr. Shofiqul Islam with thanks. His contribution and dedication as the 2003 Coordinator brought much improvement to the Centre and he provided an excellent leadership. Thank you, Shofiqul!

## Statistics Center

### P. Hooper

The Statistics Seminar normally meets on Fridays at 3:00 pm in CAB 657. Anyone interested in giving a talk at the Statistics Seminar is asked to contact Peter Hooper. We had four talks last fall.

September 19, Dr. Douglas Wiens, University of Alberta, Optimal robust methods for prediction and decision in spatial studies.

September 26, Dr. Thomas Lee, Colorado State University, Identifying and Tracking Turbulence Structures.

October 3, Dr. Hee-Seok Oh, University of Alberta, Hybrid wavelet shrinkage.

November 3, Dr. Ivan Mizera, University of Alberta, Plastic Splines: Total Variation Regularization in Bivariate Smoothing

Two additional statistics groups meeting this year.

The Robustness workshop meets Wednesdays at 3:30. Participants discuss their ongoing, and hence incomplete, research in order to receive feed-

back from the others. See Doug Wiens for further information.

The Statistical Learning reading group meets Mondays at 3:30. The discussion is based primarily on the book "The elements of statistical learning: data mining, inference, and prediction" by Hastie, Tibshirani, and Friedman. See Hee-Seok Oh for further information.



## Associate Chair of Graduate Studies Y.S. Wong

For the 2003-04 academic year, 36 new graduate students have arrived and started their graduate programs in our Department. The total number of our graduate students is currently 116. We made 60 offers this past year and 66% accepted. Four students requested to delay their program to the Winter term 2004 and the Fall term 2004.

About half of the new students are Canadian citizens or permanent residents, with the remaining half from overseas. The quality of our new students are strong, and about 22% have been awarded with major scholarships. Among the 36 new graduate students starting in the Fall term, we have four NSERC PGSA scholars, three F.S. Chia Ph.D. scholars and one UofA Master scholar.

In the University of Alberta major award competitions this year, our graduate students have also been doing very well. Two students were awarded Izaak Walton Killam Memorial Scholarships, two were awarded Dissertation Fellowships and one awarded the Andrew Stewart Memorial Graduate Prize. For the 2003 NSERC PDF competition, one student was awarded an NSERC PDF, and one has been offered an NSERC Industrial Research Fellowship.

With the introduction of the new course THES 919, which is the same as the THES 909 but with a reduced tuition fee, I would like to advise all graduate students should try to complete their coursework within two years for the PhD program and one for the M.Sc. program. Not

only you will then pay a reduced tuition fee, but it will also help your supervisor to pay for the differential fee if you are from overseas.

During the Fall term, our graduate committee will be seeking nominations for Josephine Mitchell Scholarships, the Josephine Mitchell Prize, and a new award for excellence in mentoring. The winners will be announced in the next Departmental newsletter.

Finally, I am happy to report that Dr. Maria M. Klawe, a graduate from our department with a PhD in Mathematics in 1977, has received the 2003 Distinguished Alumni Award - the U of A Alumni Association's most prestigious award.

## Graduate Students Award Recipients:

### NSERC PGS-A:

Yves Langlois, Rebecca Oulton,  
Peter Pivovarov, Dawn van Weeldon

### F.S. Chia Scholarship:

Peter Molnar, Haibo Ruan, Zhian Wang

### UofA Masters Scholarship:

Benjamin Wards

### Izaak Walton Killam Memorial Scholarship:

Jeong Yup Lee, Jan Rychtar

### Dissertation Fellowship:

Peter Campbell, Ovidiu Voitcu

### Andrew Stewart Memorial Graduate Prize:

Jan Rychtar

### NSERC PDF:

Monica Ilie

### NSERC Industrial Research Fellowship:

Shuqing Ma

### 2003 Pundit Sharma Award recipients:

Linglong Kong

Yves Langlois

Zhian Wang

### 2002-03 CAIMS Dissertation Award

Connell McCluskey

### Poster Award at the 2003 MITACS AGM in Ottawa

Cristina Popescu

Rocio Sotomayor received an award for her academic accomplishments.

## Applied Mathematics Institute (AMI)

**J.W. Macki, Director**

The AMI has a new director. Professor Michael Li will assume the position as soon as he clears away some other responsibilities, July 1, 2004 at the latest. The AMI special talk series continues. Speakers during the last semester included:

January 21, 2003, Dr. A.B. Gurung, University of Hong Kong

“Detection of Non-linearity in Hydrometeorological Time Series”

August 21, 2003, Mateusz K. Reszka and Theodore G. Shepherd, University of Toronto

“Dynamical Balances in the Tropical Middle Atmosphere”

September 2, 2003, Professor Shouting Gao, Chinese Academy of Sciences

“Moist Potential Vorticity Substance Dynamics and Its Applications for Persistent Torrential Rain Forest”

October 17, 2003, Professor Benqi Guo, University of Manitoba

“Approximation Theory of the P-version of the Finite Method in the Framework of the Jacobi-weighted Besov Spaces”

October 24, 2003, Professor Bo Deng, University of Nebraska-Lincoln

“Ecological Time Scales, Stability, and Chaos”

November 28, 2003, Professor John W.M. Bush, Massachusetts Institute of Technology

“New structures in free surface flows”

December 2, 2003, Professor Brian Sleeman, University of Leeds

“Partial differential equations of chemotaxis exhibiting blow-up, collapse, aggregation and spike behavior”

The AMI Syncrude Lecture Series will start in early June, 2004. The first lecture will (tentatively) be given by Dr. Daniel

D. Joseph, Regents Professor in the Department of Aerospace Engineering and Mechanics at the University of Minnesota.

The Canadian Applied Mathematics Quarterly is slowly moving towards being up-to-date.

All of Volume 10 (2002) has either been mailed (10-1, 10-2), is being printed (10-3), or has just gone to the printer (10-4). All of Volume 11 will be devoted to proceedings from the Butler Conference, and we are presently slotting accepted papers into Volume 12 (2004).

Thanks to wonderful money management by Herb Freedman and Jo So, the Butler Conference is able to make a substantial contribution to CAMQ.

CAMQ has not renewed its contract for TeX editing with the Canadian Mathematical Society. Although their service was excellent, the cost was far too high for a small journal like ours. We expect to reduce our TeX editing costs by 50% by moving the TeX editing to the U of A. We are still evaluating our relationship with Quality Color Printing, which has certainly been an interesting one, and at times very frustrating.

Members of the AMI continue to receive recognition and awards:

- Yanping Lin is awarded 2004 MaCalla Professorship

- Sam Shen’s research was featured on the central television of China (CCTV)

- A 4-year \$350,000 CFI New Opportunities Award is awarded to Bin Han, Michael Li (project leader) and Sam Shen

Graduate Students in Applied Mathematics continue to be successful:

- Connell McCluskey (supervisor James S. Muldowney) is awarded a 2002-03 CAIMS Doctoral Dissertation Award

- Shuqing Ma (co-supervisors Walter Allegretto and Yanping Lin) is awarded a NSERC Industrial Research Fellowship

- Cristina Popescu (supervisor Yaushu Wong) is a winner of the Poster Award at the 2003 MITACS AGM in Ottawa

- Ovidiu Voitecu (supervisor Yaushu Wong) received a U of A Dissertation Fellowship



## PIMS News

### J. Muldowney, Site Director

#### New Director at PIMS

A major milestone in PIMS short history was passed when Nassif Ghoussoub retired as the Founding Director. In the late Spring the Board of Directors of PIMS announced the appointment of Dr Ivar Ekeland as his successor as Director. The appointment is for a term of 5 years.

#### The North-South Dialogue

The 3rd N – S Dialogue was scheduled to meet in Calgary on the weekend of April 26 – 27. This coincided with the worst snowstorm of the year when all movement within 100 kilometres of Calgary squished to a halt. The wise did not even attempt to attend while the more foolhardy set out and were forced to turn back by the inclement weather. The U of C hosts, though stuck with the bill for the scheduled banquet, gallantly soldiered on and rescheduled the event for June 28 – 29. This weekend proved to be completely snow free and, despite the rescheduling, attracted over 80 participants from Augustana College, Mt. Royal College, Concordia College, Grande Prairie Regional College, Red Deer College, and Universities of Alberta, Lethbridge, Calgary. The 4th N – S Dialogue is scheduled for May 8 – 9, 2004 at Red Deer College.

#### Pi in the Sky

Although Wieslaw Krawcewicz has stepped down as Editor-In-Chief and this responsibility now lies with Ivar Ekeland at UBC, he still remains the major creative force behind Pi in the Sky. Fortunately the numerous tasks entailed in its production are being spread a little more widely. All of the major technical functions have now been transferred to UBC. Most of the creative effort still comes from Edmonton with five of the eight persons on the editorial board (including Wieslaw) being U of A faculty.

#### Math Fair

The BIRS Math Fair Workshop that was organized for 40 school and post-secondary faculty in Banff, April 10 – 12, 2003. A report by Ted Lewis and Andy Liu appears on page 47 of *PIMS Magazine*. Another Math Fair Workshop is scheduled at BIRS for April 22 – 24, 2004. Ted and Andy now con-

centrate their efforts on training math fair organizers and their concept is really taking off here and internationally. Their own direct organization of math fairs is restricted to the practicum portion of Math 160 which consists of a large math fair in Dinwoodie at SUB each term. Many of our graduate students generously volunteer their time in support of these fairs.

#### Research Activities

A major focus of the research activity of PIMS is now through the medium of the NSERC-funded Collaborative Research Groups that focus periods of concentration in selected research areas and must involve researchers at several PIMS universities. A large active group working on Mathematical Ecology is coordinated by U of A mathematical biologists including Mark Lewis, Gerda de Vries and Thomas Hillen. Their activities included hosting a BIRS workshop in Banff, a 2-week summer school in math biology for undergraduates in Edmonton.

Research workshops and conferences during the reporting period were:

**April 30 – May 9, 2003:** Mathematical Biology and Ecology Summer School. This attracted many undergraduate applicants from across Canada from whom 20 were selected to participate. Students were introduced to research techniques in the field and designed and completed research projects under the supervision of faculty and senior graduate students. This school was part of the Period of Concentration on Mathematical Ecology.

**June 11 - June 13, 2003:** Connecting Women in Mathematics. This was a special workshop for female graduate students and faculty that addressed particular aspects of a woman's career as a professional mathematician.

**June 17 – June 21, 2003:** 3rd GJ Butler Conference on Differential Equations and Population Biology. This conference attracted 85 of the world's leaders in research on differential equations and dynamical systems.

**July 27 – August 12, 2003:** Banach Algebras and their Applications. This conference was the sixteenth in a series that began in Los Angeles (UCLA) in 1974. Subsequent meetings

have been in locations as diverse as Berkeley (1986), Canberra (1989), Cambridge (1991) and Winnipeg (1993). There were 140 participants from around the world. This conference was part of the Period of Concentration on Dynamics and Related Areas.

PIMS post-doctoral fellows and their sponsoring faculty were:

Dr. Wen Chen (Bin Han and Rongqing Jia)

Dr. Christina Cobbold (Mark Lewis)

Dr. Matthias Neufang (Volker Runde and Tony Lau)

Dr. Sumati Surya (Don Page)

Dr. Roman Vershynin (Nicole Tomczak-Jaegermann)

Dr. Chuong Tran (John Bowman)

There were two PIMS Distinguished Chairs:

July 11 – August 13, 2003: Alexander Helemskii (Moscow State University); PIMS Distinguished Chair in Dynamics. This Chair was part of the Period of Concentration on Dynamics and Related Areas. The lectures are available online at

[www.pims.math.ca/publications/distchair/](http://www.pims.math.ca/publications/distchair/).

September 10 – September 30, 2003: Bryan Grenfell (Cambridge University); PIMS Distinguished Chair in Mathematical Ecology. This Chair was part of the Period of Concentration on Mathematical Ecology. The lectures are available online at

[www.pims.math.ca/science/2003/distchair/grenfell/](http://www.pims.math.ca/science/2003/distchair/grenfell/).

#### The Industrial Initiatives Program

An undergraduate industrial co-op program of the Applied Mathematics Institute is supported by PIMS, with Shirley Mitchell providing organizational assistance for student-industry contacts and information sessions.



## Administrative Officer Report

### R. Mikalonis

This has been a busy year for physical changes to CAB. With all the new buildings that have been built in the last couple of years and the renovations to older buildings that have taken place, University Administration apparently feels that buildings like CAB need to have some physical ‘enhancements’ as well. Many of the projects that I will be reporting on were initiated by Central Administration.

#### Asbestos Removal

This past summer we endured the removal of asbestos-containing wall texture from the stairwells. This project has finally been completed with the painting of the stairwells and the installation of the vinyl baseboards.

#### Security Upgrade

Security upgrade of the stairwells and elevators was proposed in order to prevent off-hours access to Departmental space by unauthorized individuals. This project was delayed by the asbestos removal, but is now nearing completion. Card-readers and the wiring for them are installed, an administrative computer workstation is set up, and software is installed. One-card numbers have been collected and are waiting to be inputted into the database. We are currently waiting for lock hardware for the 4<sup>th</sup> Floor hall doors to be delivered and once the installation of that hardware is completed, a few of our administrative staff will be trained on the use of the software and we will finalize the set-up. I anticipate that we will test the system by locking off the hall doors during a work day to see how the system holds up under heavy use.

#### Door Replacement

The office doors on the 4<sup>th</sup> Floor of CAB were replaced. I was advised that for now only the 4<sup>th</sup> Floor would be done

because the doors there were in the poorest condition. There is no immediate plan to replace all doors in CAB but some of the best doors salvaged from the 4<sup>th</sup> Floor will be used to replace some of the worst doors on the 5<sup>th</sup> and 6<sup>th</sup> Floors. Some of these replacements have occurred.

#### Lock Changes

There is a project underway that will result in the wholesale change of every existing lock on the 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> Floors of CAB. We have been working with the Lockshop on this project and I anticipate that the actual physical changes will occur sometime in the next 2 months. This was a centrally driven project. We will keep you informed as we receive information.

#### Ceiling Tile Replacement

Another centrally driven project that was thrust upon us without much consultation. It is, for the most part, completed.

#### Pictorial Directories

We have worked on this project on and off over the past several months as we were able. We are now very close to completion. As you read this, the matting for the pictures is being cut and the labels mounted. This should be completed this week. The photographs have been labelled and are ready to be mounted once we receive the completed picture frames.

#### Floor Directories and Floor Signage

We consulted with Creative Services on a plan for new signage for the 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> floors of CAB and for floor directories for those same floors. The cost estimates to fabricate and install the Floors Directories was deemed too high by executive council so we limited the scope of the project to floor signage only. This

signage has been produced and installed. We then explored the concept of creating a floor directory poster that could be installed in the glass display cases on each floor. After several drafts and consultations we are now at the stage of having the posters trimmed and some matting cut for the installation. This should occur within a week. We now have a digital template for each poster that can be edited easily as information changes. The costs of having new posters printed and trimmed is very small compared to the Creative Services proposal. I envision updating these posters at least annually and more frequently as required.

#### Fire Alarm System

This has been an ongoing project for the last several months and it is still not complete. There are still some final adjustments to be made.



# Scientific Report of the CMS Summer Meeting 2003

Y. Lin

The 2003 CMS Summer Meeting (about 400 participants) was held at the University of Alberta on June 14-16, 2003. The meeting began with Robert Moody (Alberta) delivering a Public Lecture entitled Tilings: an evening excursion to the zoo. The event, held at the Telus Center, drew a large audience and was followed by a welcoming reception.

Other special events included plenary talks delivered by Ingrid Daubechies (Princeton University), Roland Glowinski (University of Houston), Gerhard Huisken (Tuebingen/Albert Einstein Institute), James Lepowsky (Rutgers University), and Dennis Shasha (Courant Institute).

The Canadian Mathematical Society was pleased to present lectures from their research prize winners, specifically, the CMS Jeffery-Williams Lecture, given by Ram Murty (Queen's University) and the CMS Krieger-Nelson Lecture, given by Leah Keshet (University of British Columbia).

Special symposia were held in:

- Algebraic and Geometric Topology
- Approximation Theory and Applied Harmonic Analysis
- Computational and Analytical Techniques in Modern Applications
- Conformal Field Theory
- Design Theory and Coding Theory
- Discrete Mathematics
- Dynamical Systems
- Industrial Mathematics
- Infinite Dimensional Dynamical Systems

- Mathematical and Computational Finance
- New and Successful Courses and Programmes in Mathematics
- Physics and Geometry
- Real Analysis

Two related activities were organized separately from the meeting. The 2003 Project NExTMAC National Workshop and the Conference for Women Graduate Students in Mathematics were each very successful and their organizers and sponsors are to be congratulated.

The Meeting Committee acknowledges the financial support of:

- The National Programme Committee
- University of Alberta, Department of Mathematical and Statistical Sciences
- University of Alberta Conference Fund
- University of Alberta Faculty of Science
- University of Alberta Theoretical Physics Institute
- University of Alberta Applied Mathematics Institute
- University of British Columbia Faculty of Science
- University of British Columbia Mathematics Dept
- Perimeter Institute for Theoretical Physics
- Canadian Institute for Theoretical Astrophysics

- Nelson, A Thomson Company
- Meeting Director : Yanping Lin (Alberta)

Local Chair: Eric Woolgar (Alberta)

Monique Bouchard (CMS ex-officio).

## Fourth Geoffrey J. Butler Memorial Conference on Differential Equations and Mathematical Biology

H. Freedman and J. So

The conference was held on June 17-21, 2003 on the University of Alberta campus. This was the fourth of a series of conferences held in the memory of our former colleague and friend, Geoffrey James Butler, who succumbed to cancer in July of 1987. The topics of the Conferences were related to the areas of his research.

This Conference was also in honour of the retirement of Professor Paul E. Waltman of Emory University, a close friend and collaborator of Geoffrey Butler. The organizers of the Conference were W. Allegretto, L. Erbe, H. Freedman (co-chair), M. Lewis, Y. Lin, J. Macki, J. Muldowney, H. Smith and J. So (co-chair).

The conference was sponsored by the following groups and organizations: Applied Mathematics Institute of the University of Alberta, Butler Memorial Fund, Dean of Science, Department of Mathematical and Statistical Sciences (UofA), Pacific Institute of Mathematical Science, University of Alberta Conference Fund.

The Butler Lecturer for this Conference was Professor Gail Wolkowicz (McMaster). Other keynote speakers were: Gerda deVries (Alberta), Emanuele Dibenedetto (Vanderbilt), Odo Dikemann (Utrecht), Karl Hadeler (Tuebingen), Thomas Hillen (Alberta), Yang Kuang (Arizona State), Michael Li (Alberta), Konstantin Mischaikow (Georgia Tech), Wei-Ming Ni (Minnesota), Horst Thieme (Arizona State), Jianhong Wu (York).

Altogether, there were over 80 participants, 14 keynote addresses and 40 contributed talks.

The proceedings of the Conference will be published as a volume of the Canadian Applied Mathematics Quarterly. All papers will be refereed. To date there are 23 submissions to the proceedings.

The next conference is planned for 2007.

## Announcing the Birth of GAME: Graduates at Alberta Mathematics Etc.

T. Holloway

The goal the GAME, a new student group for our department, is to enhance teaching, learning (research), and service through planned activities and regular social meetings. GAME has a standing table at Powerplant (Friday, 5pm, upstairs) and intramural sports teams for every season (These and all activities are open for staff and students alike).

Upcoming are the Math fair and Hal-

loween potluck and Masquerade party. The math fair is a major event that will bring hundreds of school students to the university on October 27th. One can participate by volunteering for the math UN-fair which pits the kids against mathematicians in a Mathematical game (Nim). Talk to some of the grads/profs that participated last year, and (sometimes) lost! The Halloween party is 6-10pm on October 31st at the (haunted) Heritage room in Athabasca Hall. Bring something to share for dinner.

Graduate students that would like to visit local schools will be partnered with the national program, "Let's Talk Science". A problem solving session or an interesting and accessible lecture would be quite a treat for school kids and might help them to see the beauty of mathematics beyond their tedious calculations.

Buy a membership, get involved, and make your own club activity.



## Centre for Mathematical Biology

**M. Lewis, Director**

The Centre for Mathematical Biology is now 2.5 years old and continues to promote research in Mathematical Biology at the University of Alberta through its interdisciplinary researchers, visiting speakers, and workshops. Below is a brief update since Spring 2003.

### Researchers

Joining the CMB are two postdoctoral fellows – Erik Noonburg (University of California) who is studying elk migration and Joanna Renclawowicz (Polish Academy of Sciences, shared with PIMS/University of Victoria), who is studying West Nile virus and chemotaxis; a part-time computer analyst - Mark Duller; and several new graduate students - Andria Dawson (Mathematical and Statistical Sciences), Peter Molnar (interdisciplinary Biological Sciences/Mathematical and Statistical Sciences), and Zhian Wang (Mathematical and Statistical Sciences). Welcome all!

Congratulations to Tom Robbins on his successful doctorate defence at University of Utah and to Annemarie Pielaat, former CMB postdoctoral fellow, on her new position at RIVM in her native Netherlands! Another CMB alumnus, Christina Cobbold, is now a faculty member at the University of Glasgow.

In the news: Peter Antonelli's work regarding evolution and mathematics was recently featured in the Edmonton Journal (January 28, 2004).

Also, a paper on the spread of West Nile virus (Royal Proc. Acad. Sci. London B - published online January 26, 2004) by Marjorie Wonham (Killam PDF), Tomas de-Camino-Beck (Biological Sciences PhD student), and Mark Lewis was itself spread by the media (Folio, Gateway, CBC radio and TV, Global News, Edmonton Journal, Calgary Sun, Toronto

Star)!

### Visiting Speakers

Providing opportunities to meet and collaborate with other interdisciplinary Mathematical Biology researchers is a priority at the CMB. Since last report, the CMB has hosted 18 visitors including several long-term visitors: PIMS Distinguished Speaker Bryan Grenfell, Cambridge University; Pauline van den Driessche, University of Victoria; Leeza Pachepsky, post doctoral fellow, University of California; and Endowment Fund for the Future Distinguished Visitor Brian Sleeman, Leeds University. Most CMB visitors presented seminars at the Mathematical Biology seminar series (see [http://www.math.ualberta.ca/~mathbio/seminar/2003-2004\\_Seminars.html](http://www.math.ualberta.ca/~mathbio/seminar/2003-2004_Seminars.html)).

### Summer Workshop

The 2nd Annual PIMS Mathematical Biology Summer Workshop for undergraduates was hosted last May with 22 students attending from 14 universities across Canada and the US. Instructors included four CMB members: Gerda de Vries, Thomas Hillen, Mark Lewis, and Frithjof Lutscher, and a special guest lecturer: Pauline van den Driessche, University of Victoria. Participants were very enthusiastic about applying models to “real-world” problems.

Promising to be equally successful is the 3<sup>rd</sup> Annual PIMS Mathematical Biology Summer Workshop (May 4-14, 2004) with last year's instructors plus a special guest lecturer - Leah Edelstein-Keshet, University of British Columbia. Undergraduate students in their 2<sup>nd</sup> or 3<sup>rd</sup> year of studies are encouraged to apply by March 12, 2004  
<http://www.pims.math.ca/science/2004/mathbiosys/>).

### PIMS Period of Concentration in Mathematical Ecology and Evolution

The period of concentration is coordinated by Thomas Hillen. Upcoming events such as the 2 and 5-day BIRS workshops can be found at <http://www.pims.math.ca/CRG/ecology/>.

## Math Biology Seminars

### G. de Vries & M. Lewis

#### Fall 2003

Sept. 8, Dr. Frithjof Lutscher, PDF UofA, "A solution of the drift paradox"

Sept. 15, Dr. Bryan Grenfell, PIMS Dist. Visitor, CambridgeU, "Waves, sparks and wavelets: measles in space and time"

Sept. 22, Dr. Michael Li, UofA, "Immune response to HTLV-I infection and backward bifurcation"

Oct. 20, Dr. Michael Mackey, McGill U, "Mathematical models of gene regulation"

Oct. 24, Dr. Bo Deng, U of Nebraska-Lincoln, joint talk with AMI/DE&DS, "Ecological time scales, stability, and chaos"

Oct. 27, Dr. Leeza Pachepsky, PDF, Uof California, Santa Barbara, "When individuals make a difference"

Nov. 3, Dr. Pauline van den Driessche, UofVictoria, "Epidemic thresholds"

Nov. 17, Dr. Fangliang He, UofA, "Occupancy, spatial variance, and the abundance of species"

Nov. 24, Dr. Bernard Roitberg, SFU, "The importance of behavior to malaria epidemiology"

Dec. 1, Dr. Hongmei Zhu, UofC, "A recent multi-scale time-frequency analysis and its biomedical applications"

Dec. 9, Dr. James Watmough, U New Brunswick, "Disease transmission in human populations: simple models of a complex system"

#### Winter 2004

Jan 19, Dr. Erik Noonburg, PDF UofA, "Resource allocation in variable environments"

Jan 26, Dr. Dan Coombs, UBC, "Chirality inversions propagating on bacterial flagella"

Feb. 2, Dr. Janet Elliott, UofA, "Mathematical and thermodynamics modeling in cryobiology"

Feb. 9, Amy Norris, McGill U, "Exploring large-scale gene and protein expression data"

Feb. 23, Dr. Troy Day, Queen's U, "Modeling the evolutionary dynamics of pathogen virulence"

March 1, Dr. Alex Potapov, UofA

March 15, Dr. Gino Fallone, UofA, "Image-guided adaptive radiotherapy at the Cross Cancer Institute"

March 22 Michael Doebeli, UBC, "Adaptive speciation: theory and experiments"

April 5, Dr. Christina Cobbold, University of Glasgow

# Algebra Seminars

## G. Cliff

### Fall 2003:

Sept. 8: Pavel Shumyatsky, University of Brasilia

Positive Laws in Fixed Points

Sept. 17: Karl-Hermann Neeb, University of Darmstadt, Germany

Extensions of Lie Algebras

Sept. 24: Martin Kassabov (post-doctoral fellow at U of Alberta)

On the Automorphism Tower of Free Nilpotent Groups

Oct. 1: Phillipe Gille, University of Paris Sud,

The Bloch-Kato conjecture and l-adic cohomology

Oct. 8: Dimitar Grantcharov, (post-doctoral fellow at U of Alberta),

Coherent families of weight modules of Lie superalgebras

Oct. 15: Alexander Nenashev, University of Regina

Push-forwards in cohomology theories for algebraic varieties

Oct. 22: Gerald Cliff

Symplectic Schur algebras

Nov. 5: Sudarshan Sehgal

Central Units in Integral Group Rings

Nov. 12: Mazi Shirvani

Soluble subgroups of division rings, and the rigidity of crossed products

Nov. 19: Martin Kassabov

### Winter 2004

Jan. 7, 2004, Roy Joshua, Ohio State University and IAS, Princeton

Kunneth Decompositions for Quotient Varieties

Feb. 4, 2004, Arturo Pianzola

Loop Algebras

Feb. 25, 2004, Martin Kassabov

Weak Identities and Discriminating Groups

## Seminar on Differential Equations and Dynamical Systems

### T. Hillen

September 10/03	Michael Li	Global Hopf Bifurcation in a Delayed Nicholson Blowflies Equation
September 24/03	Richard van Weelden	On explicit solutions to stochastic differential equations on manifolds
October 1/03	Alex Potapov	Pseudostructures: Ultra-Long Transients in Chemotaxis Models
October 6/03	Joint with Math-Bio Seminar: Special Talk: Yuan Yuan, Memorial	Recent Development of Normal Form Theory and its Applications
October 8/03	Horacio Gomez	A model for infections by ixodid ticks
October 15/03	Thomas Hillen	$L^2$ moment closure of transport equations I: general case
October 22/03	Thomas Hillen	$L^2$ moment closure of transport equations II: general case
October 29/03	Bruce Sutherland	“Quantum” Tunneling of Gravity Waves
November 12/03	Herb Freedman	Predator-Prey Systems Interacting with Parasites
November 19/03	Jana Kopfova Silesian University Opava Czech Republic	Entropy conditions for a quasilinear hyperbolic equation with hysteresis
November 26/03	Pauline van den Driessche Univ. Victoria	Dispersal in Predator-Prey Systems
December 2/03	Brian Sleeman, Univ. Leeds	Partial Differential Equations of Chemotaxis Exhibiting Blow-up,
January 16/04	Mary Pugh, Univ of Toronto	A finite locus effect diffusion model for the evolution of a quantitative
January 21/04	Lynn Erbe, Univ of Nebraska	Linear and Nonlinear Dynamic Equations of Time Scales

## Colloquium Speakers

### R. Rhemtulla

“Classical Enumerative Geometry and Quantum Cohomology”	Professor James McKernan University of California	Thursday, September 4, 2003
“The Branble-Hilbert Lemma for convex domains”	Professor D. Leviatan Tel Aviv University	Tuesday, September 9, 2003
“Comparative dynamics of childhood Grenfell microparasitic infections and the impact of vaccination”	Professor Bryan Department of Zoology Cambridge University	Thursday, September 11, 2003
“Quadratic forms and algebraic cycles”	Professor Nikita Karpenko University of Lens	Thursday, October 2, 2003
“Cracking the Neural Code”	Professor Bo Deng University of Nebraska, Lincoln	Thursday, October 23, 2003
“The Fuzzy Space Time Paradigm”	Professor BG Sidharth International Institute of Applicable Mathematics & Information Sciences Adarsh Nagar	Thursday, October 30, 2003
“On Some Singularities in Parameter Estimation Problems”	Professor Marat V Burnashev Institute for Problems of Information Transmission Russian Academy of Sciences	Thursday, November 20, 2003
“Stochastic Optimization Models for Ruin Probability Minimization and Dividend Distribution Optimization”	Professor Michael Taksar University of Missouri, Columbia	Monday, November 24, 2003
“Existence and nonexistence of Fujita-type critical exponents for isotropic and anisotropic semi-linear parabolic systems”	Professor Brian Sleeman University of Leeds	Thursday, November 27, 2003

## Seminar on Algebraic Groups

### A. Pianzola

We are following Demazure-Gabriel's "functorial" point of view. The aim is a detailed proof of the Smoothness Theorem. Speakers are V. Chernousov and A. Pianzola.

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## Geometry Seminar

### G. Peschke

September 18, 2003, "An infinite introduction to Riemann curvature and Ricci curvature," Dragos Hrimiuc  
September 25, 2003, "Ricci Curvature Flows I," Eric Woolgar  
October 2, 2003, "Ricci Curvature Flows II," Eric Woolgar  
October 9, 2003, "Ricci Curvature Flows III," Eric Woolgar  
October 16, 2003, "Ricci Curvature Flows IV," Eric Woolgar  
October 30, 2003, "Ricci Curvature Flows VI," Eric Woolgar  
November 6, 2003, "Ricci Curvature Flows VII," Eric Woolgar  
November 13, 2003, "On the Affine Deformation of a Minkowski Norm," Dragos Hrimiuc  
November 20, 2003, "Ricci Curvature Flows VIII," Eric Woolgar  
November 27, 2003, "Ricci Curvature Flows IX," Todd Oliynyk  
December 4, 2003, "Ricci Curvature Flows X," Todd Oliynyk  
January 8, 2004, "Bounded cohomology and hyperbolic groups," Igor Mineyev  
(Princeton and UIUC Urbana-Champaign)  
January 15, 2004, "Equivariant Homotopy Groups of Spheres and Twisted Framed Bordism," George Peschke  
January 22, 2004, "What can we say about certain elementary geometric configurations spaces from the point of view of algebraic geometry and / or mechanics," George Peschke  
February 12, 2004, "On the Clemens Conjecture," Xi Chen  
February 26, 2004, "A discussion of Millennium Problem #21 The Hodge Conjecture," James Lewis

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## Robustness Seminar/Workshop, Fall 2003

### D. Wiens

Doug Wiens: Designs for Spatial Studies, September 24  
Fred Ackah: Robust Design in Clinical Trials, October 8  
Xiaojian Xu: Optimal Implementation of a Continuous Design Measure, October 22  
Adeniyi Adewale: Robust Designs for Generalized Linear Models with Misspecified Link Function, November 19  
Hee-Seok Oh: Robust Wavelet Shrinkage, December 3

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## A Major Equipment Grant: Mathematical & Statistical

Bin Han, Michael Li (project leader), and Sam Shen received an equipment grant of \$350,000 from the Canada Foundation for Innovation (CFI). The fund has been used to buy the equipment for Information Research Laboratory (IRL), which is located in CAB 476. The fund has also helped to replace and upgrade the old departmental file server, and to upgrade the department server's network switch from 200 Mbps to 1000 Mbps.

## A New MITACS Grant

Sam Shen and Michael Li were awarded a MITACS Seed Grant of \$60,000 for their project of Climate Signal Analysis. They also obtained a cash matching-fund of US\$87,454 from the US National Climatic Data Center, and in-kind supports from the NASA Goddard Space Flight Center and Alberta Agriculture, Food and Rural Development.

## Sam Shen Honored in China

Chinese Premier, Wen Jiabo, received Sam Shen and a group of scientists from around the world on November 14, 2003 in the Great Hall of People, Beijing. The group was invited by the Chinese Ministry of Science and Technology to advise the Chinese government on development strategies of the future science and technology. The group consisted of Nobel Laureates Carlo Rubbia and C.N. Yang, Canadian MP Gilbert Normand (former Secretary of State for Science, Research and Development), President of French Academy of Sciences Etienne Baulieu, eleven young overseas Chinese scientists, and governmental delegates from USA and other developed countries.

The China Central TV aired a 15-minutes exclusive interview with Sam Shen on December 6 and 7, 2003, in the program of "Across the Strait." Sam called on the Chinese government to dramatically increase the investment in rural schools, to develop a learning and fair society in China, and to develop an immigration program attracting the talents from around the world.



Dr. Sam Shen and the Chinese Premier, Honorable Wen Jiabo

## Newsletter

Michael Li  
Editor

Phone: 492-2032  
Email: [mli@math.ualberta.ca](mailto:mli@math.ualberta.ca)

**Last Day of Classes**  
**April 7th**

We're on the Web!

[www.math.ualberta.ca/newsletter.html](http://www.math.ualberta.ca/newsletter.html)



## Humour

Question: Why was six afraid of seven?

Answer: Because 7 8 9.

Question: What did one math book say to the other?

Answer: Don't bother me! **I've got my own problems!**

Question: Did you hear the one about the statistician?

Answer: Probably....

Question: "How many seconds are there in a year?"

Answer: "Twelve. January *second*, February *second*, March *second*, ..."