

CMS

NOTES

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FROM THE PRESIDENT'S DESK



Richard Kane
Annual Report 1999

(voir la page 11 pour la version française)

This article, my Annual Report for the year 1999, is an outline of some of the year's highlights for the CMS. A number of annual committee reports will also appear in this issue of the *Notes* and they provide fuller details about the accomplishments of our members.

I begin by reminding everyone that "Math 2000" will be taking place during June 10-13 at McMaster University. This meeting is part of the Canadian celebration of "World Mathematical Year 2000" (WMY 2000). It is a large joint meeting involving the participation of six different Canadian mathematical organizations including the CMS. It has a very ambitious and diversified scientific program involving 20

special sessions and 15 plenary speakers including a number of Fields Medal winners. It promises to be a most memorable meeting and I hope to see you there. Math 2000 will culminate a week of intense mathematical activity. It is preceded by two other major events being held in Toronto: the first MITACS General Meeting (June 6-7) which will include a CMS Job Fair and the Symposium on the Legacy of John Charles Fields organized by the Fields Institute.

In general, much of what happened within the CMS could be described as a continued evolution in which existing trends were reinforced and planning was also undertaken for future developments. The future of the CMS was certainly a major topic in the CMS during 1999 and that will continue in 2000. A comprehensive review was set into motion two years ago with Board approval of a Strategic Planning document. By June of this year eight separate task forces or associated committees will have submitted reports on various aspects of CMS operations. Beginning in the second half of this year the Executive will consider all these reports and begin to develop an overall strategy for implementing the various recommendations. A final summary report on planning is due in the year 2001.

(see PRESIDENT—page 10)

CMS NOTES
NOTES DE LA SMC

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Editors-in-Chief

Peter Fillmore; S. Swaminathan

Managing Editor

Robert W. Quackenbush

Contributing Editors

Education: Edward Barbeau
notes-education@cms.math.ca

Meetings: Monique Bouchard
notes-meetings@cms.math.ca

Research: Noriko Yui;
James D. Lewis
notes-research@cms.math.ca

Editorial Assistant

Caroline Baskerville

The Editors welcome articles, letters and announcements, which should be sent to the *CMS Notes* at:

Canadian Mathematical Society
577 King Edward
P.O. Box 450, Station A
Ottawa, Ontario, Canada K1N 6N5
Telephone: (613) 562-5702
Facsimile: (613) 565-1539
E-mail: notes-articles@cms.math.ca
notes-editors@cms.math.ca
Web site: www.cms.math.ca

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EDITORIAL



Peter Fillmore

With the arrival of May, the annual conference season is at hand. The choice this year, with its many millennium activities, is particularly large and interesting. In Canada, the omnibus meetings in Quebec this month and in Hamilton next month will bring together unusually large groupings of mathematically oriented organizations. And the Hamilton meeting, MATH 2000, together with the Symposium on the Legacy of J. C. Fields that precedes it in Toronto, will offer a rare opportunity to see a constellation of Fields medallists in action. In July, the Third European Congress, in Barcelona, should be of exceptional interest, as will the special August meeting of the AMS in Los Angeles.

In this issue we present the annual reports of the Society's standing committees, which taken together, present a good picture of our many and diverse activities. If you would like to be involved in any of these, the Nominating Committee would be glad to hear from you! We are also inaugurating a column of brief reviews of books that are important but perhaps not of sufficiently general interest to warrant a full review.

This issue is the last of the current academic year. We will return in September and in the meantime wish our readers a pleasant and productive summer.

Le mois de mai est à nos portes et avec lui, le temps des congrès. Pour souligner l'an 2000, les activités offertes cette année sont particulièrement nombreuses et intéressantes. Au Canada, les congrès « omnibus » de Québec ce mois-ci et de Hamilton le mois prochain réuniront un nombre inhabituellement élevé d'organismes d'intérêt mathématique. À la Réunion de Hamilton (MATH 2000), qui sera précédée d'un symposium sur l'héritage de J. C. Fields, à Toronto, vous aurez le rare privilège de côtoyer toute une brochette de récipiendaires de la médaille Fields. En juillet, le troisième congrès de la Société Mathématique Européenne, tenu à Barcelone, devrait être particulièrement intéressant, tout comme le congrès spécial de l'AMS, qui se tiendra à Los Angeles en août.

Dans le présent numéro, nous vous présentons les rapports annuels des comités permanents de la Société, qui vous donneront un bon aperçu de nos nombreuses et diverses activités. Si vous aimeriez participer à l'une ou l'autre de ces activités, le Comité des mises en candidature se fera un plaisir d'entendre parler de vous! Nous inaugurons également une chronique de brèves critiques de livres intéressants, mais dont l'intérêt n'est pas assez général pour mériter une critique exhaustive.

Ce numéro est le dernier de l'année scolaire. Nous vous reviendrons en septembre et vous souhaitons, d'ici là, un été agréable et productif.

**Have a Great Summer
Bonnes Vacances!!**

**From the CMS Executive
Office – du bureau
administratif de la SMC**

RESEARCH NOTES

Noriko Yui and James D. Lewis, Column Editors

André-Aisenstadt Prize

Created in 1991, the André-Aisenstadt Mathematics Prize is intended to recognize and reward talented young Canadian mathematicians. The recipient of the millenium André-Aisenstadt Prize is Changfeng Gui of the Univeristy of British Columbia for his contribution in the field of *Nonlinear Partial Differential Equations*.



Changfeng Gui

Dr. Gui received his early education at Peking University, obtaining his B.Sc. and M. Sc. from that institution. He completed his Ph.D. at the University of Minnesota in 1991. After pursuing postdoctoral studies at the Courant Institute (1991–1993) and at McMaster University (1993–1995), he arrived at the University of British Columbia in 1995 as an Assistant professor. Currently he is an Associate Professor at that institution.

His accomplishments which have led to this prize may be summarized in as follows:

- He has settled fundamental questions regarding high energy solutions for nonlinear Schrödinger equations and for nonlinear

singularly perturbed Neumann problems.

- He has made with his collaborators, Alama, Bronsard, Schatzman fundamental contributions to the study of multiple phase dynamics by establishing rigorously the existence of basic configurations near multi-junctions and non-trivial transition layers for vector-valued Allen-Cahn systems.
- He has solved with Ghoussoub a long standing open problem proposed by De Giorgi regarding the uniqueness of transition profile in dimension 2, and also solved in dimension 3 a related conjecture by the cosmologist Gibbons. He then proceeded with Barlow and Bass to settle Gibbons' conjecture in all dimensions as well as DeGiorgi's conjecture (for $n \geq 3$) under some additional but quite mild conditions.
- He has also done important work in understanding the stability and blow-up phenomena of nonlinear heat equations and porous media equations, and in classifying the coexistence states of Lotka-Volterra competition systems.
- He and his collaborator Wei also finally settled the issue of the best constant in the Moser-Aubin-Onofri inequality for radially symmetric functions on the 2-dimensional sphere.

These contributions establish him as a leading researcher in several important fronts in the field of partial differential equations. Here is a brief description of his most important work.

Gui's recent work deals with a very interesting nonlinear singularly perturbed Neumann problem that arises in the study of pattern formation in biology. This problem involves the determination of the activator concentration in a certain singularly perturbed limit for the famous Gierer-Meinhardt activator-inhibitor system, which models the phenomenon of morphogenesis in biology. It is observed in experiments and in computer simulations that there can be very large gradients of the activator concentration around certain points in the domain. In biological modeling, it is believed that in regions where the activator concentration is very large, localized biological structures such as the heart, liver etc. can be formed. However, from a mathematical viewpoint, it is extremely difficult to establish the existence of such solutions.

The problem was first tackled by Wei-Ming Ni and I. Takagi. In a sequence of papers in the mid eighties, they succeeded in showing rigorously the existence of a solution with a single localized peak in the activator concentration. The breakthrough came from their study of the existence and asymptotic behavior of the so-called "least energy" solutions. In order to show the existence of multiple peak solutions, a deep understanding of possible "higher energy" solutions was needed. Gui's work improved a general variational method regarding "higher energy" solutions – recently devised by E. Sere – and showed for the first time the phenomenon of multiple peak solutions. He and his collaborators eventually gave surprising solutions to this class of problems by showing the existence of multipeak solutions and by providing precise information on their

location albeit on the boundary (in connection with the curvature) or in the interior of the domain (in connection with sphere packing). He also solved problems with similar features for nonlinear Schrödinger equations.

More recently, Changfeng Gui and his collaborator Wei in Hong Kong constructed a family of solutions which simultaneously spikes on the boundary and in the interior of the domain. The difficulties in constructing such solutions lie in the fact that the boundary spikes and the interior spikes usually have different scales of error estimates. To solve this problem, which eluded the best experts in that field, they developed a very delicate variational approach to deal with these two scales.

In the study of phase transition, a fundamental question is to find the basic profile or configuration near the transition interface. In the mid-seventies, De Giorgi proposed a famous conjecture regarding the uniqueness of such basic profile for the Allen-Cahn model for anti-phase transition: the transition profile must depend only on one variable and therefore be unique. Since then a lot of effort has been made to prove this conjecture by many top mathematicians. Although some partial results have been obtained by Caffarelli and his collaborators, the conjecture was only proven true under various restrictive conditions. Recently, the conjecture was completely answered affirmatively by Ghoussoub and Gui in dimension 2. They also solved the Gibbons conjecture in dimension 3. For that, new ideas and methods had to be developed to improve on those of Berestycki, Caffarelli and Nirenberg.

In a continuation of this work, Gui together with Barlow and Bass have completely solved the Gibbons conjecture in all dimensions. To accomplish that, they first prove a general Liouville theorem for harmonic functions associated with non-uniform elliptic operators in divergence form. This type

of Liouville theorem is itself groundbreaking, important, and quite difficult. Its proof is a beautiful combination of analytic and probabilistic arguments. Moreover, by using this Liouville-type theorem, they come very close to solving the 25 years old DeGiorgi conjecture, by showing that the solutions to the corresponding PDE must be constant on hyperplanes as long as the level sets of the solutions are either Lipschitzian or bounded. This result has numerous applications to phase transition problems.

Working with the generalized vector-valued Allen-Cahn equation for three phase transition Gui and his collaborators showed the existence of a basic configuration near a triple junction of those phases. Mathematically, it involves an entire vector-valued solution from R^2 to R^2 which displays three transition layers along three different directions (forming 120 degree angle each other). The existence of such basic configuration should play a fundamental role in the study of multiple-phase dynamics.

In another beautiful work, Gui and his collaborator Wei also finally settled the issue of the best constant in the Moser-Aubin-Onofri inequality for radially symmetric functions on the 2-dimensional sphere. This inequality deals with the best Sobolev constant for Dirichlet integrals on two dimensional manifolds. Three years ago Feldman-Froese-Ghoussoub-Gui had improved the constant from 1 to $16/25$ and showed that it cannot be lowered below $1/2$. Very recently, Gui and Wei showed in a remarkable tour de force that the constant is sharp at $1/2$! This result is expected to have important applications in geometric analysis. He also gave a sharp asymptotics for the scalar curvature of complete noncompact negatively curved spaces.

Among Gui's early works, his PhD thesis deals with the very fine structure of stability for a nonlinear heat equa-

tion in the entire space. He found a critical nonlinearity in the source term: when the nonlinearity increases and crosses this critical exponent the nontrivial steady states switch from being not stable at all to being stable in certain fine weighted norm. This phenomenon surprised many experts and really changed the thinking in the subject. Gui's work on the symmetry of the blow-up set for a type of porous media equations is beautiful (to quote L. Nirenberg). He basically showed that the blow-up set of these equations, must be the union of balls of certain radii. His work on the Lotka-Volterra system (PDE) reveals the critical role of the competition rate: strong competition makes a system unstable while weak competition makes it stable. He also constructs many complicated unstable states for the case of strong competition.

Congratulations to Dr. Changfeng Gui!

Killam Fellowship

The Canada Council has announced the award of a Killam Fellowship for 2000-2002 to François Lalonde (UQAM).



François Lalonde

After completing a B.Sc. in physics and a M.Sc. in mathematics (complexity theory and discrete mathematics) at the University of Montreal, François

Lalonde did a Doctorat d'Etat in differential topology at Orsay and a postdoc at the CNRS and at the IHES. He was awarded an NSERC URF and chose UQAM in 1985. He became full professor in 1991 and was elected a Fellow of the Royal Society of Canada in 1997. He was Chair of NSERC's GSC 336 in 1998.

He is currently a member of the Scientific Advisory panels of both the Fields Institute and the CRM. His main collaborator, Dusa McDuff, gave a plenary talk at the last ICM in Berlin covering their joint work. He is finishing a 4-year mandate as director of the Institut des sciences mathématiques. The following is the description of Dr. Lalonde's research plan during the tenure of his Killam Fellowship.

It is remarkable that the fundamental laws of physics can be best understood through the "least action principle". The Lagrange-Hamilton mathematical formulation of this principle, which also applies to quantum dynamics thanks to path integrals, is a striking example of the interaction between mathematics and physics.

This interaction is more lively than ever: concurrent advances in symplectic and Riemannian differential geometries and in Quantum Field Theory (QFT) associated with string and M-theories have brought about fruitful outcomes, such as *Mirror symmetry*, *Quantum Cohomology* and the *Gromov-Witten invariants*. While the motivation in physics comes from the attempts to make gravity and QFT compatible, it arises in mathematics from the search for new global *invariants* that provide information about the analytical structures of general manifolds of arbitrary dimension. Usually, these invariants lead to a deeper understanding of the relations between the topology of these spaces and the more subtle global structures that they can support. This is the case with *symplec-*

tic structures, structures that are fundamental since they govern both Hamiltonian mechanics and quantization procedures. However, from a mathematical point of view, these structures are not associated primarily with mathematical physics, but with differential geometry and topology, subjects that are at the heart of the new trends in mathematical research. Significant progress on these geometric questions would affect other fields of pure mathematics, like the theory of differential operators, Lie group theory and complex analysis.

The primary goal of this proposal is to understand symplectic manifolds, i.e. manifolds endowed with a symplectic structure which is the anti-symmetric analogue of a Riemannian metric. They reflect a natural duality: they can be considered either as the spaces where classical Hamiltonian dynamics take place or as a very useful generalisation of complex algebraic geometry (the so-called "hard symplectic topology"). Some of the most recent developments (for instance Gromov invariants and J-holomorphic curves, Sieberg-Witten equations, or Donaldson's theory) provide strong evidence that by exploiting this duality, we finally have at our disposal tools that are powerful enough to analyze symplectic structures and their corresponding dynamics. This is what we showed with our classification of ruled symplectic 4-dimensional manifolds, and we plan to apply these methods to understand more general families of 4-manifolds. Using algebraic and pseudo-holomorphic methods, we will study the infinite dimensional group of Hamiltonian diffeomorphisms of these spaces.

Thanks to the above duality, we have recently shown (with McDuff and Polterovich) that Quantum cohomology can be successfully applied to deal with some of the most elusive topological aspects of these groups. In

the long-term, this research programme also aims to develop a new Finsler geometry that measures distances between Hamiltonian flows by minimising the amount of energy needed to generate a dynamical process that interpolates between them. We have already shown that this geometry plays a fundamental role in our understanding of symplectic spaces, dynamical systems and homotopy groups of symplectic diffeomorphisms. We are still far from a comprehensive geometric theory of symplectic invariants, but we think that the completion of this programme would represent a significant step in that direction.

Congratulations!

Sloan Fellowship



John Toth

John Toth (McGill) has been awarded an Alfred P. Sloan Research Fellowship. The fellowship carries with it a sum of \$40,000 (U.S.) and is awarded to young scientists in the United States and Canada who "show the most outstanding promise of making fundamental contributions to new knowledge."

Professor Toth's interests include spectral theory, partial differential equations and mathematical physics.

EDUCATION NOTES

Ed Barbeau, Column Editor

PREPARATION OF ELEMENTARY TEACHERS

University of Toronto

Since 1993, the mathematics department of the University of Toronto has been offering a course entitled *Concepts in elementary mathematics* at the third-year level for students planning to go into elementary teaching. Since the size of the class was to be restricted, students had to ballot for the course, and were accepted on the basis of serious intent to enter the teaching field and grades sufficiently high to make a credible application to a faculty of education. It was anticipated that many of the students in the course would not have high school mathematics beyond the level of Grade 11 or Grade 12.

The purpose of the course was to provide students with experiences in the mathematics relevant to the elementary curriculum. This would involve group and individual work in solving problems and some exposure to the general lore of mathematics, so that they would have some understanding of the nature of our discipline and be able to bring insight into their teaching.

Originally, the course was supervised by a triumvirate consisting of faculty members of the mathematics department and the faculty of education as well as a practising teacher in the Toronto system, and we tried to involve practising teachers as well as undergraduate students. While we had a Toronto board person (Mrs. Susan Seidman, currently principal of the Waterfront School at Bathurst Street and Queens Quay) involved in the course for many years, we found that it was not possible to have teachers coming for a weekly three-hour session for the entire academic year. They wanted something more focussed on their daily concerns than the more exploratory approach we favoured, and when the government ceased to cover the costs of additional qualification courses, the teachers would have had to bear the tuition fee themselves. The course is currently taught by Ed Barbeau in the mathematics department and Brendan Kelly, a professor of education whose first doctorate was in number theory under the supervision of John Chalk, but who became a secondary teacher and coordinator of mathematics for several years.

How are students evaluated? First, students are expected to attend regularly and participate in class activities. Sometimes this will consist of lecture and discussion, sometimes group work on problems, sometimes a presentation by a visitor. During the year, the syllabus covers topics in arithmetic, geometry, combinatorics (including some basic probability) and recreational mathematics. Secondly, student maintain reflective logs which they submit regularly for marking; they are expected to discuss their mathematical experiences and issues on the teaching of mathematics. This should go beyond a mere diary of events or a diatribe; we encourage them to back up their opinions with critical analysis. As budding

teachers, they will hear a great many things about the teaching of mathematics and it is important to provide them with the tools and confidence to make their own independent judgments. Thirdly, students are asked to read an article in the educational literature and submit a critical review; many of them select an article from the NCTM journal *Teaching children mathematics*. Fourthly, they must submit solutions to about a half dozen problem sets, the rules being that they may discuss the problems with whomever they wish but that they must write the solutions on their own, so that they reflect their own understanding of the situation. The students have respected the intent of this rule, and cheating has never been a problem in the course.

The final requirement is that the students must work on some mathematical project with a group of children, give a short oral presentation to the class and submit a written report. Most of the students, realizing that having practical experience is the key to being admitted to a teaching program, are volunteers in schools, and it is not hard for the lecturers to line up a placement for the few remaining students. What the students are able to do depends on circumstances and the goodwill of their supervising teachers. In some cases, they are allowed to teach a mathematical unit to the whole class; in other cases, they may do remedial or enrichment work with a small group of pupils. In some cases, the students are employed by or volunteer at a tutorial service, often run by their own religious or cultural groups.

We have been very pleased with the quality and seriousness of the students in the course. While we do not get hardcore mathphobic students, many of the students have minimal background in mathematics but seem to get well into the material. Sometimes, they do better than students who are taking other university mathematics courses but who seem to be more inhibited in their thinking and less able to analyze their learning of mathematics. It is deliberate policy not to have tests nor a fixed syllabus, but rather to focus on difficulties and misconceptions as they arise. As the students are told, "we do not expect you to learn any particular thing in this course, but we would be disappointed if you learned nothing".

In our selection of material, we are anxious to address issues that are controversial in elementary education and contextualize the mathematics that they do. Accordingly, we draw on materials in the *Impact Mathematics* series for middle school that Brendan Kelly was heavily involved with; in one class for example, the students construct the top half of a geodesic dome and then discuss its properties. We look at traditional problems, such as those about sharing, pouring fluid among vessels, using an equal-arms balance and crossing rivers. We look at mathematics in practical situations, such as in a Toronto-Dominion advertisement that compared two

investment regimes in an RRSP. We discuss games and puzzles. We look at contributions from other cultures and eras, such as African sand patterns or alternatives to the standard algorithms. We examine the role of technology and traditional paper-and-pencil algorithms, the tension between rote and understanding, the place of exercises and problems. In the end, our hope is that the students will become teachers who will embrace the teaching of mathematics to elementary students and be aware of the many possibilities for doing this effectively.

THE INTERNATIONAL MATHEMATICAL TALENT SEARCH

In 1989, the United States of America Mathematical Talent Search was initiated under the joint sponsorship of the Rose-Hulman Institute of Technology and the Consortium for Mathematics and its Applications. The impetus for this came from George Berzsenyi, then professor at RHIT, who created or selected the problems. Each year, four sets of five problems were mailed out to students to solve and return for marking. Students with sufficiently high scores or with meritorious solutions received book prizes and were recognized in a newsletter.

It was not long before George decided to go international. He recruited a group of national judges from various countries and expanded the USAMT into the *International Mathematical Talent Search*, whose problems are published in each issue of *Mathematics and Informatics Quarterly*, a journal for school students published quarterly in Singapore. This journal contains articles on mathematical and computing themes as well as problems by mathematicians from Bulgaria, the United States and elsewhere (including Andy Liu from the University of Alberta). Journal subscriptions can be had at \$25 (Canadian) per year through Ed Barbeau at the University of Toronto (cheques payable to Edward J. Barbeau). However, the problems are also available on the website of the Canadian Mathematical Society.

The problems are ideal for a broad range of secondary students. They are not all difficult, but most of them have a bit of spark, and some of them can even be adapted for use for

students in senior elementary school. Thus they are not only well-suited to their intended purpose of identifying students with mathematical talent, but can be used by teachers as enrichment materials and in some cases as group investigations. Here are three examples from the most recent round; they are more difficult than the norm:

Problem 1/35. We define the *repetition number* of a positive integer n to be the number of distinct digits of n when written in base 10. Prove that each positive integer has a multiple which has a repetition number less than or equal to 2.

Problem 2/35. Let a be a positive real number, n a positive integer, and define the *power tower* $a \uparrow n$ recursively with $a \uparrow 1 = a$, $a \uparrow (i + 1) = a^{a \uparrow i}$ for $i = 1, 2, \dots$. For example, we have $4 \uparrow 3 = 4^{4^4} = 4^{256}$, a number which has 155 digits. For each positive integer k , let x_k denote the unique positive real number solution of the equation $x \uparrow k = 10 \uparrow (k + 1)$. Which is larger: x_{42} or x_{43} ?

Problem 4/35. We say that a triangle in the coordinate plane is *integral* if its three vertices have integer coordinates and if its three sides have integer lengths.

(a) Find an integral triangle with a perimeter of 42.

(b) Is there an integral triangle with a perimeter of 43?

Examples of easier problems are:

Problem 1/25. Assume that we have 12 rods, each 13 units long. They are to be cut into pieces measuring 3, 4, and 5 units, so that the resulting pieces can be assembled into 13 triangles of sides 3, 4, and 5 units. How should the rods be cut?

Problem 1/33. The digits of the three-digit integers a , b , and c are the nine non-zero digits 1, 2, \dots , 9, each of them appearing exactly once. Given that the ratio $a : b : c$ is 1 : 3 : 5, determine a , b , and c .

Pupils wishing to participate in the International Mathematical Talent Search should get in touch with Ed Barbeau (barbeau@math.utoronto.ca). Teachers who wish to have a collection of problems from the IMTS, with some commentary, for use with younger high school students and middle school students can get this from Ed Barbeau.

NOTICE

The Exective Office will be closed for two weeks this summer from **August 7th to the 18th inclusive.**

AVIS

Le Bureau d'administration sera fermé pour deux semaines cette été du **7 au 18 août.**

AWARDS / PRIX

2000 Krieger-Nelson Prize

Kanta Gupta of the University of Manitoba, a leading expert in the field of group theory, will give the fifth Krieger-Nelson Lecture at the CMS Summer Meeting in June of 2000.

Chander Kanta Gupta is professor of Mathematics at the University of Manitoba. She is a graduate of the Australian National University, Canberra where she earned M.A(Hons.) and Ph.D degrees working in group theory under Prof. M. F. Newman. Her undergraduate education is from her home university of Jammu and Kashmir and she also holds a Master's degree in Mathematics from the Aligarh University, India. Her principal field of research is combinatorial group theory where she has made significant contributions in the

areas of representation theory of relatively free groups and the automorphism groups of free solvable groups. Existence of 2-torsion in free centre-by-metabelian groups is among her earlier works. C.K's current work includes finite basis problem and automorphisms of free associative algebras and polynomial algebras.

Kanta has been a principal speaker in most international conferences in Group Theory. She has held short visiting positions at various mathematics institutions abroad (e.g. Steklov, Brasilia, Rome, Napoli, Ruhr, TIFR and Athens) and has collaborated successfully with many researchers at home and abroad. Among her academic distinctions is her election in 1991 as a Fellow of the Royal Society of Canada.

BRIEF BOOK REVIEWS

S. Swaminathan, Dalhousie University

1. **Enumerative Combinatorics**, Vol. 2, by Richard Stanley, Cambridge Studies in Advanced Mathematics 62, Cambridge University Press, 1999, 581 pages.

This is the second of a two-volume basic introduction to enumerative combinatorics at a level suitable for graduate students and researchers. Topics covered: (i) Trees and the composition of generating functions, (ii) algebraic, D-finite, and noncommutative generating functions, and (iii) symmetric functions. It is claimed that the chapter on symmetric functions provides the only available treatment of this subject suitable for an introductory graduate course and focussing on combinatorics. There are over 250 exercises, with solutions or references to solutions.

2. **Calculus of Variations**, by Jurgen Jost and Xianqing Li-Jost, Cambridge Studies in Advanced Mathematics 62, Cambridge University Press, 1999, 323 pages.

The aim of the authors is to present some of the many faces of the calculus of variations. The first part of the book treats the more elementary and

classical aspects of the subject in one independent variable, while the second part is concerned with some more difficult topics and treats problems for functions of several variables using somewhat more abstract reasoning.

3. **Character Sums with Exponential Functions and their Applications**, by Sergei Konyagin and Igor Shparlinski, Cambridge Tracts 136, Cambridge University Press, 1999, 161 pages.

From the Preface: In this book, we consider various questions related to the distribution of integer powers g^x for some integer $g > 1$ modulo a prime p with $\gcd(g, p) = 1$. Possible applications where such results play a central role include, but are not limited to, linear congruential pseudo-random number generators, algebraic number theory, the theory of function fields over a finite field, complexity theory, cryptography, and coding theory.

4. **Approximate Methods and Numerical Analysis for Elliptic Complex Equations**, by Guo-hun Wen, Asian Mathematics Series, 2, Gordon and Breach Science Publishers, Amsterdam, 1999, 235 pages.

The book is about the theory of, and approximation methods for, non-linear elliptic complex partial differential equations in multiply-connected domains. Methods such as the (i) Newton imbedding, (ii) continuity, (iii) finite element, (iv) difference, and (v) the boundary integral methods are discussed.

5. **Surveys in Combinatorics**, 1999, edited by J. D. Lamb and D. A. Preece, London Mathematical Society Lecture Notes Series 267, Cambridge University Press, 1999, 298 pages.

This volume contains the text of invited talks from the British Combinatorial Conference, University of Kent at Canterbury, 1999. It begins with the Rado Lecture on "The Coming of the Matroids" by W. T. Tutte, in which the author rehearses his role in the development of the theory of matroids. Eight articles cover talks spanning a broad range of combinatorial topics by S. Ball, J. Dinitz, M. Dyer, K. Metsch, J. Pach, R. Thomas, C. Thomassen, and N. Wormald. The volume provides an outstanding and up-to-date resource for all researchers in combinatorics.

FROM THE INSTITUTES

PIMS Thematic Program—Summer 2001

This is a preliminary announcement for a thematic period at the Pacific Institute for the Mathematical Sciences (PIMS). Activities will take place primarily at the Vancouver facility of the Institute during the summer of 2001.

Nonlinear Partial Differential Equations: Variational and Viscosity Methods, Concentration Phenomena, Nonlinear Dynamics and Phase Transitions.

Program Committee: Maria J. Esteban (Paris), Nassif Ghoussoub (UBC), Changfeng Gui (UBC), Pierre-Louis Lions (Paris), Wei-Ming Ni (Minnesota), Paul Rabinowitz (Wisconsin), Gang Tian (MIT).

Those interested in participating should contact any member of the program committee or the Pacific Institute directly at: "pde@pims.math.ca" or "<http://www.pims.math.ca/pde>"

Preliminary Programme:

1. Workshop on Viscosity methods

Monday July 02 - Tuesday, July 10, 2001

Conference on Free Boundary Value Problems

Wednesday, July 11 - Friday, July 13, 2001

2. Workshop on Phase Transitions

Monday July 16 - Friday July 20, 2001

3. Workshop on Concentration Phenomena and Vortex Dynamics

Monday July 23 - Saturday July 28, 2001

4. Workshop on Variational methods in PDE

Monday July 30 - Tuesday, August 07, 2001

Conference on the Calculus of Variations in Geometry and Physics

Wednesday, August 8 - Friday August 10, 2001

5. Workshop on Geometric PDEs

Monday August 13 - Friday August 17, 2001

6. Related PIMS event:

Workshop on Theoretical and Numerical Fluid Mechanics, Monday August 20 - Friday August 25, 2001, organized by Giovanni P. Galdi (Pittsburgh), John Heywood (UBC) and Rolf Rannacher (Heidelberg)

Each session involves a workshop of 6 to 7 days (minimal set of lectures to allow time for interaction and collaboration). Also planned are 3 day conferences between adjacent workshops, on bridging themes.

Two series of 5 mini-lectures are planned for each session. They may run for 1 hour in the morning and 1 in the afternoon each day for 5 consecutive days. These are directed to advanced graduate students, postdocs and non-specialists who are interested in learning a new active direction of research.

The preliminary list of mini-course lecturers includes: H. Berestycki (Paris), Y. Brenier (Paris), M. Crandall (Santa Barbara), M.J. Esteban (Paris), C. Evans (Berkeley) (To be confirmed), P. L. Lions (Paris), F.H. Lin (Courant), Wei-Ming Ni (Minnesota), E. Séré (Paris), R. Schoen (Stanford), M. Struwe (ETH) (To be confirmed), C. Taubes (Harvard), G. Tian (MIT).

News from the Fields Institute

Symposium on the Legacy of John Charles Fields

June 7 to 9, 2000. At the Royal Ontario Museum, 100 Queen's Park Downtown Toronto, Ontario, Canada

The Symposium will feature lectures by Fields Medallists and historical lectures on the development of mathematics over the past seventy years from the perspective of the Medallists, and the role of the Canadian mathematician whose vision and leadership was instrumental in establishing this medal.

Banquet: Sir Michael Atiyah will be the keynote speaker at the WMY 2000 Fields Institute Banquet on June 8, 2000 at 7 Hart House Circle, University of Toronto.

For further details, please visit:

<http://www.fields.utoronto.ca/jcfields-legacy.html>

On-line registration is available.

Contact us at: jcfields@fields.utoronto.ca

Operator Algebras Symposium

The Fields Institute hosts the 28th Annual Canadian Operator Algebras Symposium, June 4-8, 2000. For further details and to register, please visit: <http://www.fields.utoronto.ca/COS2000.html>

Call for nominations: CRM-Fields Prize

Nominations are being accepted for the CRM-Fields Institute Prize which recognizes exceptional achievement in the mathematical sciences. Nominations should be submitted by October 1, 2000, by at least two sponsors of recognized stature and should include a supporting letter, curriculum vitae, list of publications and up to four preprints.

Submit documents by mail to: Director, The Fields Institute, 222 College Street, 2nd Floor, Toronto, Ontario, M5T 3J1; or by fax to (416) 348-9714. For further details, please call (416) 348-9710.

Upcoming Programs

Infinite Dimensional Lie Theory and Its Applications

September 2000 - January 2001

Various infinite-dimensional Lie algebras and Lie groups, including groups of diffeomorphisms and algebras of vector fields, the affine Kac-Moody algebras and groups, Borcherds Lie algebras, algebras of pseudodifferential operators and various generalizations of these, have beautiful connections with other areas of mathematics and physics such as quantum field theory, fluid mechanics, singularity theory, modular forms,

the Monster group, and soliton theory, to name just a few. These topics, as well as other related aspects and applications of Lie theory, complete the program.

For more information send an e-mail to: lietheory@fields.utoronto.ca or visit the web-site at: <http://www.fields.utoronto.ca/lietheory.html>.

Symplectic Topology, Geometry and Gauge Theory
January - June 2001

This program will bring together researchers in symplectic topology and algebraic geometry, gauge theory and quantum field theory, Hamiltonian group actions and quantization problems, as well as in other related areas. This is a part of the joint CRM-Fields Institute symplectic semester.

For information send an e-mail to: symplectic@fields.utoronto.ca or visit our web-site at: <http://www.fields.utoronto.ca/symplectic.html>.

Events Update

New events are now listed on the Activities and Events page. Visit <http://www.fields.utoronto.ca/topic.html> to be updated.

To receive automatic notice of events organized by, sponsored by or occurring at the Fields Institute; including workshops, seminars and lectures, news from our Principal Sponsoring Universities and Affiliate Universities and to be notified about job opportunities, please register your e-mail address at: <http://www.fields.utoronto.ca/maillist>.

(PRESIDENT—continued from page 1)

One report is already being implemented. A major review of Electronic Services and of the CMS web-site Camel took place during 1999. As a consequence of that review, the Electronic Services Committee was downsized and this more compact group has been mandated to prepare detailed policy statements, in the framework of the review report, regarding the functions and priorities of Camel and its administrative structure.

One exciting innovation of the past year has been the implementation of the Endowment Grants Program. During 1999 the first Endowment Grants Committee was formed and its first funding decisions were made. It is anticipated that when the Endowment Grants Program is fully operational the Endowment Fund will be providing at least \$60,000 in funding per year to help support a variety of mathematics projects across Canada.

A striking trend within the CMS is the continued expansion of our support of student activity at all levels. At the high school level, the already impressive CMS enrichment program is being augmented by a nation wide Math Camp Program partially sponsored by Imperial Oil, as well as by a new publication series ATOM. At the post-secondary level, a number of new links have been created or are on their way to being created. The CMS im-

plemented a policy of free membership for all mathematics graduate students. A new focus on industrial training is emerging. The first CMS Job Fair occurred at the Winter Meeting in Montreal and another one will be taking place in Toronto in June. A new CMS Student Committee was formed in 1999. This committee is intended, in part, to serve as a liaison group between students and the CMS. Notably, it will support a national student newsletter and a student website.

Our two semi-annual meetings held during 1999 at St John's and Montreal were very successful with large attendance and a very broad range of sessions. The meetings of the past few years confirm the effectiveness of our evolving meeting format in terms of encouraging participation. The involvement of the three Mathematical Institutes whereby each will participate in a semi-annual meeting by organizing a session has been confirmed and will take effect at this June's meeting. We continue to pursue our partnership with the Mathematical Institutes in other ways. The CMS Job Fairs, mentioned above, are being organized in conjunction with the Institutes and MITACS.

The organizational structure of the CMS is continuing to evolve. We have already mentioned changes in Electronic Services and the creation of the Endowment Grants Committee and the Student Committee. With the appoint-

ment of Robert Quackenbush (Manitoba) as Managing Editor of CMS publications in June, Graham Wright no longer has these duties, allowing him more time for fund raising and promotional activities. It seems fair to say that it is still undecided how we will eventually structure the Executive Director's position. Notably will the CMS need to move to a full time Executive Director?

Significant changes in a number of CMS standing committees also occurred. The Investment Advisory Group of the Finance Committee was dissolved after years of effective service. This was a logical consequence of the adoption last year of a "passive investment" policy regarding our, now extensive, segregated Investment Funds. (Endowment Fund and Mathematical Olympiads Fund). It represents a step in the evolution of a more articulated and coherent investment policy. In another rationalization, the Board agreed in June to abolish the Governmental Affairs Committee. The main responsibility of that committee, the Annual Survey, is also under review.

At the Board level, beginning this year, the Institutes and the Statistics Society of Canada (SSC) will have representatives on the CMS Board. The arrangement with SSC is actually for mutual representatives. The CMS/NRC agreement for NRC funding of Canadian membership in the International Mathematical Union has been renewed.

The new agreement contains a proviso for travel funds for Canadian delegates to attend IMU General Assemblies.

The re-organized Fund Raising Committee continues its pursuit of corporate sponsors and of members. These are very important initiatives. Our current budget is committed and the ability of the CMS to sponsor a wider range of activities is contingent on our ability to access new funding. Likewise the renewal and expansion of membership is also a priority. This year witnessed the implementation of our new membership reciprocity agreement with the AMS, which we hope will be effective. Also we have a new

policy of offering three years of complementary membership to new faculty in Canadian Mathematics departments.

As the already mentioned “Math 2000” attests, WMY 2000 has arrived. The CMS is playing an active role in its celebration. Besides its key organizational role with regards to “Math 2000”, the CMS has also contributed \$45,000 to partially fund eight different WMY 2000 projects across Canada. For information on WMY 2000 and the many projects taking place across Canada and the globe consult the website “wmy2000.math.jussieu.fr”.

This *Notes* article is my final one as CMS President. The McMaster meet-

ing in June will mark the official end of my two year term. I would like to thank everyone who has been so supportive, both of the CMS and of me personally, over the past two years. The CMS is a very successful professional organization and it has achieved its present position via the work of a large group of dedicated volunteers and staff. I feel privileged to have had the opportunity to represent these people and to work with them. I extend my very best wishes to my successor, Jonathan Borwein. I am sure that he will experience the same high level of support from our membership.

DU BUREAU DU PRÉSIDENT

Rapport Annuel 1999

(see page 1 for the English version)

Le présent article, qui constitue à la fois mon rapport annuel pour l’année 1999, décrit les hauts faits de l’année à la SMC. Plusieurs rapports annuels de comités aussi publiés dans ce numéro des Notes vous donneront plus de détails sur les réalisations de nos membres.

Laissez-moi d’abord vous rappeler que Math 2000 aura lieu du 10 au 13 juin à l’Université McMaster. Ce congrès s’inscrit dans le cadre des activités canadiennes pour souligner l’an 2000, année internationale des mathématiques. Il s’agit d’un grand congrès organisé conjointement par six organismes mathématiques canadiens, y compris la SMC. Le programme scientifique est très chargé et diversifié : il comprend 20 séances spéciales et met en vedette 15 conférenciers principaux, dont plusieurs récipiendaires de la médaille Fields. Il s’agira sans doute d’un événement mémorable, auquel j’espère vous retrouver. Math 2000 clôturera une semaine d’activité mathématique intense. Il sera précédé de deux autres activités importantes tenues à Toronto :

la première assemblée générale annuelle du réseau MITACS (les 6 et 7 juin), qui comprendra un carrefour emploi de la SMC, ainsi qu’un symposium sur l’héritage de John Charles Fields, organisé par l’Institut Fields.

De façon générale, on pourrait dire que nous avons continué cette année sur la lancée des années précédentes et entrepris la planification des années à venir. L’avenir de la SMC a certes été au coeur de nos préoccupations en 1999 et le sera encore en 2000. Il y a deux ans, l’adoption d’un document de planification stratégique par le conseil d’administration enclenchait un examen approfondi des activités de la SMC. En juin de cette année, huit groupes de travail ou comités connexes auront présenté leur rapport sur divers aspects des activités de la SMC. Dans la seconde moitié de l’année, le comité exécutif commencera à étudier tous ces rapports et entreprendra l’élaboration d’une stratégie globale de mise en oeuvre des diverses recommandations. Il présentera un rapport sommaire de planification en 2001.

La mise en oeuvre des recommandations de l’un des rapports a déjà com-

mencé. En effet, on a procédé en 1999 à un examen complet des services électroniques et de Camel, le site Web de la SMC. À la suite de cet examen, on a réduit la taille du Comité des services électronique et chargé ce groupe restreint d’élaborer des politiques détaillées, dans le cadre du rapport d’examen, sur les fonctions et les priorités de Camel et sur sa structure administrative.

L’une des innovations remarquables de l’année aura sans doute été le lancement du Programme de bourses du fonds de dotation. En 1999, le premier Comité d’attribution des bourses du fonds de dotation a été créé et a attribué ses premières bourses. On prévoit qu’une fois le programme entièrement fonctionnel, le fonds pourra remettre au moins 60 000 \$ de bourses par année pour financer diverses activités mathématiques au Canada.

Soulignons également que la SMC a continué, cette année, à accroître son appui aux activités destinées aux étudiants de tous niveaux. Au secondaire, le programme d’enrichissement de la SMC, déjà impressionnant, comptera en plus cette année un camp national de

mathématique, financé en partie par la Compagnie pétrolière impériale, ainsi qu'une nouvelle collection d'ouvrages intitulée ATOM (Aime-t-on les mathématiques). Au niveau postsecondaire, un certain nombre de liens ont été créés ou sont en voie de l'être. La SMC a adopté une politique d'adhésion gratuite pour tous les étudiants diplômés en mathématiques. Une nouvelle orientation vers la formation industrielle se dessine. La SMC a tenu son premier carrefour emploi à la Réunion d'hiver tenue à Montréal et en organise un autre en juin à Toronto. La Société a formé le Comité des étudiants en 1999, comité qui servira notamment de lien entre les étudiants et la SMC et sera responsable d'un bulletin étudiant national et d'un site Web.

Nos deux Réunions semestrielles de 1999, tenues à St John's et à Montréal, ont connu un vif succès. Elles ont attiré un grand nombre de participants, et les séances présentées étaient très diversifiées. La réussite des quelques dernières années confirme l'efficacité de la formule adoptée, notamment en ce qui concerne l'incitation d'autres instances à participer. La participation des trois instituts mathématiques (chacun participant à une Réunion semestrielle en organisant une séance) a été confirmée et commencera à la Réunion de juin 2000. Nos partenariats avec les instituts mathématiques prennent aussi d'autres formes. Par exemple, les carrefours emplois de la SMC mentionnés précédemment sont organisés en collaboration avec les instituts et MITACS.

La structure organisationnelle de la SMC continue d'évoluer. Nous avons déjà mentionné les changements apportés aux services électroniques ainsi que la création du Comité d'attribution des bourses du fond de dotation et du Comité des étudiants. La nomination de Robert Quackenbush (Manitoba) au poste de rédacteur-gérant des publications de la SMC, en juin, a libéré le directeur administratif des tâches auparavant rattachées à ce poste et lui a

permis de consacrer plus de temps à la collecte de fonds et aux activités promotionnelles. Il semble raisonnable d'affirmer que nous ne savons toujours pas comment nous remanierons le poste de directeur administratif. Nous nous demandons notamment si la SMC n'aurait pas besoin, à l'avenir, d'un directeur administratif à plein temps.

Par ailleurs, un certain nombre de comités permanents de la SMC ont subi des changements considérables : le groupe consultatif sur les investissements du Comité des finances a été éliminé après des années d'existence. Cette élimination est la suite logique de l'adoption, l'an dernier, d'une politique « d'investissement passif » relative à notre fonds d'investissement réservé (Fonds de dotation et Fonds pour les olympiades mathématiques), maintenant de taille importante. Il s'agit d'un pas de plus vers une politique d'investissement plus cohérente et organisée. Toujours dans une optique de rationalisation, le conseil a décidé d'abolir, en juin, le Comité des affaires gouvernementales, dont la principale tâche était le sondage annuel, activité elle-même à l'étude en ce moment.

À compter de cette année, les instituts et la Société statistique du Canada (SSC) seront représentés au conseil d'administration de la SMC. En fait, l'entente avec la SSC prévoit une représentation réciproque. Le Conseil national de recherches du Canada a, pour sa part, renouvelé son entente avec la SMC concernant le financement de l'adhésion du Canada à l'Union mathématique internationale (UMI). Cette entente comprend notamment le remboursement des frais de déplacement des représentants canadiens qui participeront aux assemblées générales de l'UMI.

Après une réorganisation, le Comité de la collecte de fonds continue sa recherche de commanditaires du secteur privé et de membres. Ce sont là deux initiatives très importantes. Comme les fonds dont nous

disposons actuellement sont tous engagés, notre capacité de financer une plus vaste gamme d'activités dépend de notre capacité d'obtenir des fonds supplémentaires. Le renouvellement des adhésions et l'accroissement de notre bassin de membres constituent également une priorité. Nous espérons en outre que l'entente de réciprocité sur l'adhésion avec l'AMS entrée en vigueur cette année nous sera profitable. Nous avons également décidé d'offrir trois ans d'adhésion gratuite aux nouveaux professeurs des départements de mathématiques des universités canadiennes.

Comme en fait foi le titre du prochain congrès (Math 2000), l'année internationale des mathématiques est arrivée, et la SMC y participe activement. En plus de jouer un rôle clé dans l'organisation de Math 2000, la SMC a également remis 45 000 \$ pour financer partiellement huit activités tenues dans le cadre de l'année internationale des mathématiques au Canada. Pour plus d'information sur cette année internationale et sur les nombreuses activités qui se dérouleront au quatre coins du pays et de la planète, consultez le site Web suivant : wmy2000.math.jussieu.fr.

Cet article des *Notes* est mon dernier à titre de président de la SMC. La Réunion qui aura lieu à l'Université McMaster en juin marquera la fin de mon mandat de deux ans. J'aimerais remercier tous ceux et celles qui ont appuyé la SMC et m'ont appuyé moi-même au cours des deux dernières années. La SMC est une association professionnelle qui marche admirablement bien et qui doit sa réputation actuelle au travail d'un grand nombre de bénévoles et d'employés dévoués. Je me sens privilégié d'avoir eu la chance de représenter ces personnes et de travailler avec elles. Je profite de l'occasion pour présenter mes meilleurs vœux à mon successeur, Jonathan Borwein. Je suis convaincu qu'il aura droit lui aussi à l'appui sans bornes des membres de la SMC.

CMS ANNUAL REPORTS FROM COMMITTEES

Editorial Note: The following are from the 1999 Annual Reports of the Society's Standing Committees. The Treasurer's Report will be printed in the September 2000 issue of the CMS Notes.

Education

Morris Orzech (Queen's) Chair

Jacques Bélair (Montréal)

Eddy Campbell (Queen's)

Afton Cayford (UBC)

John Grant McLoughlin (Memorial)

Denis Hanson (Regina)

Jennifer Hyndman (UNBC)

Jacqueline Klasa (Dawson College)

Andy Liu (Alberta)

Gordon MacDonald (UPEI)

Bruce Shawyer (Memorial)

Keith Taylor (Saskatchewan)

The sub-committee structure of the Education Committee was changed in 1999, with the amalgamation of two committees into one. The Committee on Promoting Public Awareness of Mathematics and the Committee for Public Lectures were combined into a Committee on Grants for Public Appreciation of Mathematics, charged with adjudicating applications for talks and events aimed at fostering appreciation of mathematics as a subject of aesthetic, practical and scientific interest. In 1999 this CMS programme supported outreach talks at a CMESG conference, an elementary school Family Math Fair, and special exhibits at an APICS conference. As an extension of this outreach programme, the Education Committee initiated a special WMY2000 initiative to help fund public events at meetings of provincial mathematics teachers' associations. The Committee also undertook development of a CMS service for helping organizers of public outreach events recruit appropriate speakers.

The other subcommittees of the Education Committee are the Committee on Grants for Provincial Competitions and the Committee on Education Materials on Camel. The first of these committees oversaw CMS support of provincial or regional competitions involving high school students in eight Canadian provinces. The Education Materials on Camel committee worked on extending use of Camel: to distribute Education Committee administrative materials (e.g. forms and information on grant applications); to link to mathematics education organizations and mathematics education resources; and to support mathematics education discussion through a bulletin board modelled on Digital-After-Math (a CMS discussion site associated to Crux Mathematicorum). The infrastructure for the education bulletin board was put in place, but public availability awaits changes in Camel structure.

The Education Committee is indirectly involved in the education sessions at the CMS annual meetings, through ap-

pointment of session organizers and by providing organizers with advice and organizational support. The education sessions at the Summer 1999 and Winter 1999 meetings were well-attended, and involved participation not only by CMS members but also by school teachers and CEGEP instructors. The themes were: What Competitions do for Mathematics and The Teaching of Linear Algebra.

This year the CMS sponsored three cash prizes for mathematics projects at the Canada Wide Science Fair in Edmonton. Arrangements for this participation involved the CMS Education Committee and the CMS Executive Director. The quality of all three winning projects was gratifyingly high. Another instance where the committee was gratified by the high quality of contenders was in selecting the recipient of the 1999 Adrien Pouliot Award. It was the pleasure of the Education Committee to select Eric Muller for the award, in recognition of his long-term, varied, and significant contributions to mathematics education in Canada.

Electronic Services

Edgar Goodaire (Memorial) Chair

François Bergeron (UQAM)

Eddy Campbell (Queen's)

Gerald Cliff (Alberta)

Robert Corless (Western)

Ian Goulden (Waterloo)

Jacqueline Klasa (Dawson College)

June Lester (UNB)

L.W. Marcoux (Alberta)

Ian Putnam (Victoria)

David Rodgers (Argus Associates)

Robert Rosebrugh (Mount Allison)

Graham P. Wright (Ottawa)

The function of the Electronic Services Committee of the Canadian Mathematical Society is to provide advice about the electronic products and services offered by the CMS and to monitor Camel, the CMS web site. The responsibilities are major because almost every area of concern to the CMS is affected by and makes use of modern technology, from the Executive Office to publications, research, education and outreach.

The CMS web site (Camel - the Canadian Mathematics Electronic Service/Les Services Mathématiques Electroniques Canadiens) receives hundreds of thousands of "hits"

per month. Created in 1994 and originally an experimental project of the Centre for Experimental and Constructive Mathematics of Simon Fraser University, a migration to the University of Ottawa was well under way by the end of 1999. In the future, the plan is to maintain and develop the CMS web site in Ottawa, while special projects and responsibility for digital versions of CMS journals will be the responsibility of the western "hump".

Camel has become an enormous depository of information and resources, about its membership, Canadian mathematics departments and institutes, and meetings, and it has links to a broad selection of web sites like NSERC and CTAN, the comprehensive T_EX archive, which are of special interest to mathematicians. One of its most popular areas is KaBoL - Knot a Braid of Links - a "cool math site of the week" service. Digital After Math provides a forum for exchanges amongst the readers of its highly regarded problem solving journal - Crux Mathematicorum with Mathematical Mayhem.

All CMS publications are now available on-line and long before hard copies arrive in mail boxes. Effective January 1, 2000 electronic versions of CMS journals will be included with the price of a regular subscription. Thus the Society should continue to see a return on its investment in digital publishing

During 1999, an ad-hoc committee chaired by Ian Goulden of the University of Waterloo conducted a major review of all CMS electronic services and produced a report intended to guide future development. The report included some interesting suggestions of ways, over and above publishing, in which Camel can generate revenue. Also, to provide better focus, it recommended a considerable downsizing of the Committee, the effects of which were noticeable by the end of the year. Ex-officio positions filled by individuals representing other CMS committees were removed, so we said good-bye to people who have previously provided important perspectives. In this connection, I thank especially Gerald Cliff, Ian Goulden, Jacqueline Klasa, June Lester and Ian Putnam. My thanks as well go to Eddy Campbell and Robert Rosebrugh, whose terms ended in December 1999. To all these people, and to continuing members Francois Bergeron, Robert Corless, Lawrence Marcoux and David Rodgers, I express my sincere gratitude for the time they have devoted to the committee and for their personal advice and support.

Endowment Grants

James Timourian (Alberta) Chair

George Bluman (UBC)
Kathryn Hare (Waterloo)
Thomas Ransford (Laval)
Richard Wood (Dalhousie)

1999 was the year in which the CMS Endowment Grants and the Endowment Grants Committee were established. The committee created documents to publicize the program, formed an application and review procedure, conducted the 1999 competition and made the first awards.

We received 13 applications for the 1999 competition. Eight were electronic applications, one was submitted as an attachment to an e-mail, and the others came into the Ottawa office either by mail, fax, or in some cases both methods. The total amount requested was \$85,000. In December, 1999, the Committee approved full or partial funding for 5 applicants totalling \$17,200, out of a budget allocation of \$40,000.

Applicants were informed in early January, 2000 of our decisions, and the successful applications can be viewed on line.

The number of applications we received was just enough: not enough to overwhelm us as we considered for the first time how to review them, but enough for us to test our procedures and to establish preliminary policies. We hope to receive many more in the 2000 Competition.

Materials for the 2000 Competition will be available on line by the spring. They will not be substantially different from the ones for 1999, but we will have more options for people to submit applications electronically and have other changes suggested by participants in the 1999 competition. Potential applicants might find it useful to look at the successful 1999 proposals as well as the fresh advice we will provide in the Spring with the directions on how to apply.

We welcome any comments about projects we should fund, the procedures we have created, or the decisions we have made.

Finance

Gordon Mason (UNB) Chair

Timothy Appelt (Structured Analytics)
Ian Goulden (Waterloo)
Richard Kane (Western)
Michael Lamoureux (Calgary)
Ben Segal (Gov. of Canada)
F. Arthur Sherk (Toronto)
Graham P. Wright (Ottawa)

The Finance Committee responsible for the overall financial activities of the Society including the annual budget and the restricted investments funds (the Endowment Fund and the Mathematical Olympiad Fund).

The Treasurer's Report provides details on the 1999 Financial Year and the 2000 Budget.

This year, with the establishment of the Endowment Grants Competition, the first allocation from the Endowment Fund was approved. \$40,000 was allocated to the Endowment Grants Competition for the 1999 Competition. A minimum of \$30,000 has been approved for the 2000 Competition and

the final amount will be confirmed by the Finance Committee at its October 2000 meeting.

With the transfer of the management of the Society's Restricted Investments to the Toronto Dominion Quantitative Capital Division, the Board approved that the Investment Advisory Group (IAG) should be dissolved. The Society is extremely grateful to those who have served on the IAG over the years, particularly Ben Segal (Chair), Timothy Appelt and Andy Dencs.

The Finance Committee will continue to include up to two consultants as members. Timothy Appelt will continue as a consultant to the Committee for a further two years and David Bates (a member of the CMS Board of Directors) has also kindly agreed to be a consultant to the Committee for two years.

Fund Raising

Richard Kane (Western) Chair

Lesya Balych (Bank of Montreal)

Jonathan Borwein (Simon Fraser)

Katherine Heinrich (Regina)

David Leeming (Victoria)

Rosaria Morelli

Georg Schmidt (McGill)

F. Arthur Sherk (Toronto)

Jon Thompson (UNB)

Joan Wick Pelletier (York)

Graham P. Wright (Ottawa)

Government Sponsors

We reached a level of 8 ministries contributing a total of \$28,000 during 1998. Because of the provincial budget cycles we are still awaiting the 1999 funding decisions for some Provincial Ministries. So far funding has been received from Alberta, Saskatchewan, New Brunswick, Newfoundland, the Northwest Territories, Quebec and Ontario totalling \$24,200.

Corporate Sponsors

The total contributions from corporate sources during 1999 was \$30,000 of which \$22,500 was new funds. Sun Life agreed to double their contribution and become a Major Sponsor of the Canadian Mathematical Olympiad. The Imperial Oil Charitable Foundation became the Title Sponsor of a new programme of national and regional math camps. We were delighted to welcome some new corporate sponsors – Bank of Nova Scotia, Becton Dickinson Canada, Celestica International Incorporated and Royal Bank of Canada

The list of private and public sector sponsors is included in the CMS Annual Report.

We are hopeful that a number of the contacts developed in last year's Fund Raising campaign will bear fruit this year. One notable success has already been attained. The Imperial Oil Charitable Foundation has agreed to almost double

their support for 2000. A number of meetings with potential corporate sponsors will be taking place this year.

The format for corporate sponsorship has been simplified as a result of the experiences of the 1999 campaign. The goal is a clearer and more coherent framework. Activities have been grouped under headings (electronic, national & international, community, awards) and sponsorship levels within a particular grouping are now fairly uniform.

Membership

This is the first year in which the new reciprocity membership agreement with the AMS will be in effect and it is hoped that it will attract a number of new members, in particular those who are currently AMS but not CMS members. Three years of free membership is being offered to new faculty. In addition, all graduate students are being offered free membership and an electronic network for these students will be set up.

Donations:

For the past two CMS membership drives, members have been given the opportunity, when renewing, to direct their donations to specific areas of CMS operations. This proved to be very successful and will continue to be a feature of the membership renewal forms. In 1998 members donated over \$6,200. In 1999 members donated \$14,800. We are very grateful for our members' generosity.

Human Rights

David Poole (Trent) Chair

Lynn Batten (Manitoba)

Margaret Beattie (Mt. Allison)

Karl Dilcher (Dalhousie)

Paul Gauthier (Montréal)

Zhiguo Hu (Windsor)

In 1999, the Society adopted a position statement on the employment situation for young mathematicians in Canada. This statement was prepared by the Human Rights Committee at the request of the Executive Committee. The statement that was approved unanimously by the CMS Board of Directors is as follows:

“The Canadian Mathematical Society has a natural interest in the employment situation for young mathematicians. Consequently, the Society is concerned over the appearance of some job advertisements in which mathematics departments at some Canadian universities are offering only short-term appointments (some as brief as nine months) in order to fill regular teaching positions. This has prompted the CMS to investigate the number of short-term appointments, and to draft this statement expressing its concern over the consequences of such appointments.

The Canadian Mathematical Society understands that short-term university appointments can be an effective solution to certain staffing problems. However, the Society holds the view that, with the possible exception of research positions, short-term appointments should be made only to fill short-term staffing needs. Whenever there is a continuing need for staff, positions should be filled by continuing appointments.

The systematic hiring of young mathematicians into non-continuing appointments undermines our profession: good people are deterred from entering mathematics by such insecure career prospects, while emerging mathematicians find themselves in circumstances that inhibit their pursuit of excellence in teaching and research. The Society urges its members to work to ensure that their departments and faculties promote the ongoing development and health of our profession."

In the fall of 1999, there was good news in the form of a news report that the South Korean mathematician Ahn Jae-Ku had been released from prison following a change of government in that country. Professor Jae-Ku had been jailed in 1994 for allegedly pro-North Korean activities. The Human Rights Committee and the Society had been monitoring the case and, along with other international organizations, had lobbied for Jae-Ku's release. The Committee is trying to obtain independent information as to Professor Jae-Ku's well-being so that a more detailed report can be provided to the Society and the Canadian mathematical community.

International Affairs

Peter Fillmore (Dalhousie) Chair

Henri Darmon (McGill)

Mohammad Hamdan (UNB)

Robert Miura (UBC)

Thomas Salisbury (York)

Catherine Sulem (Toronto)

Nicole Tomczak-Jaegermann (Alberta)

Professor Miura represents the Canadian Applied and Industrial Mathematics Society and Professor Salisbury the Statistical Society of Canada. The seat for the representative of the Canadian Mathematics Education Study Group is vacant.

As was reported to the Board a year ago, at that time the CMS-NRC partnership agreement was due for reassessment by NRC and the committee was beginning the process of gathering the information requested by NRC for this purpose. The review was conducted by NRC's Committee on International Science, Engineering and Technology (CISSET). In July we heard that on CISSET's recommendation NRC had offered to extend the agreement, subject to minor modification (including re-establishment of an NRC contribution to travel costs of Canada's IMU General Assembly delegation). But we also

heard that "CISSET members expressed some concern as to the number of Canadians involved in IMU activities both at the national and international levels [and] asked that every effort be made in the future to increase Canadian participation". IAC is somewhat mystified by this but we think it is important to understand and address CISSET's concern.

The Committee was asked by NRC to provide input for the Canadian delegation to the "World Conference on Science - Science for the Twenty-First century: a New Commitment", held in July in Budapest. We proposed that Canada "urge governments to give priority to measures that will increase mathematical literacy at all levels". We are sorry to report that in spite of our suggestion the conference documents do not contain any reference to mathematics. This is somewhat puzzling as UNESCO is a sponsor of both this conference and the "World Mathematical Year 2000".

Part of NRC's mandate is to encourage and support the holding of international congresses in Canada. The committee was not aware of any interest in the Canadian mathematical community in hosting ICM2006, and in any case such countries as France, Germany and Russia are due to host it again before Canada does.

On our recommendation Canada voted in support of establishing the IMU ad hoc Committee on Electronic Information and Communication. This important committee has begun to function, with Jon Borwein as a member, and we trust that more information will soon be available. (*Editor's Note: a report on CEIC activities appeared on page 13 of the March issue of the CMS Notes.*)

In November the Committee submitted to NRC the annual report required by the CMS-NRC agreement. That report contains further details of the committee's activities.

Mathematical Competitions

Daryl Tingley (UNB) Chair

Margaret Beattie (Mt. Allison)

Peter Crippin (Waterloo)

Luis Goddyn (Simon Fraser)

Richard Nowakowski (Dalhousie)

Bill Sands (Calgary)

Christopher Small (Waterloo)

Jean Turgeon (Montréal)

Graham P. Wright (Ottawa)

The Mathematical Competitions Committee (MCC) of the CMS is responsible for overseeing activities associated with the Society's involvement in mathematics contests. Two contests, The Canadian Open Mathematics Challenge (COMC) and the Canadian Mathematical Olympiad (CMO) are sponsored and run by the Society. The MCC is also responsible

for Canada's participation in the Asian Pacific Mathematics Olympiad (APMO) and the International Mathematical Olympiad (IMO). Other activities of MCC include the Mathematical Olympiads' Correspondence Program, and Mathematics Camps.

At the June 1999 meeting of the CMS Board of Directors, the Mathematical Olympiads Committee was renamed the Mathematical Competitions Committee. The name change was thought to be desirable as some of the recent initiatives of the Committee have been below the Olympiad level. These include the introduction of the Canadian Open Mathematics Challenge, a competition which is designed for a far greater number of students than those able to perform at the Olympiad level, the creation of the ATOM (A Taste Of Mathematics) series of enrichment books (these now come under the mandate of the Publications Committee), and the introduction of a programme of Math Camps at the grades 9-11 levels. Although all the camps the MCC is involved with, including the IMO training camps, give top notch students a wealth of mathematical enrichment, the IMO training camps and The National Math Camp (see below) are competition based. The ESSO Regional Math Camps are for mathematical enrichment. Their responsibility may well be moved to another CMS standing committee.

Much of the work of the MCC is done by its three subcommittees, namely the Canadian Open Mathematics Challenge Committee, the Canadian Mathematical Olympiad Committee and the International Mathematical Olympiad Committee. Further information, including press releases, on most of the topics in this report can be found through the CMS Competitions web page: <http://www.math.ca/CMS/Competitions/>.

The year closed on a tragic note for all of us involved with the Society's competition efforts. Jessie Lei, a two time member of Canada's IMO team and whose name appears frequently below, was in a traffic accident on Christmas Day, and died on New Years Day. (Her mother also died in the accident.) We will all miss her contagious smile and laughter.

The Canadian Mathematical Olympiad

The 31st Canadian Mathematical Olympiad (CMO) took place on March 31st, 1999. The top three students were: Jimmy Chui, Earl Haig Secondary School, Toronto, Ont; Adrian Chan, Upper Canada College, Toronto, Ont; David Pritchard, Woburn C.I., Scarborough, Ont.

These students received prizes of \$2000, \$1500 and \$1000 respectively. In addition, Jimmy Chui was presented with the Sun Life Cup, and all winners received book prizes, donated by John Wiley & Sons and Nelson Thomson Learning. More information about the 1999 CMO is available from the press releases (<http://www.camel.math.ca/New/>), the CMO web page (<http://www.camel.math.ca/CMS/Competitions/CMO/>) and the September 1999 issue of the CMS Notes (<http://camel.math.ca/CMS/Notes/>).

The Asian Pacific Mathematics Olympiad

The 1999 Asian Pacific Mathematics Olympiad (APMO) was written in March by 35 Canadian students, selected either because they had been invited to the Canadian Mathematical Society's 1999 Winter IMO Training Camp in January, or because they had placed well in the 1998 Canadian Open Mathematics Challenge. The Canadian Students performed very well, receiving 7 medals and an honourable mention. Canada placed 7th amongst the 21 participating countries. Adrian Chan received a gold medal, David Arthur and David Nicholson received silver medals, while Daniel Brox, David Pritchard, Jimmy Chui, and Jessie Lei received bronze medals. Adrian Lau received an honourable mention.

The International Mathematical Olympiad

The 1999 (40th) International Mathematical Olympiad (IMO) was held in Bucharest, Romania July 10-22, with 82 countries participating. Canada's team consisted of Jimmy Chui, Earl Haig Secondary School, North York, Ontario and Yin (Jessie) Lei, Vincent Massey Secondary School, Windsor, Ontario both of whom were part of Canada's 1998 IMO team, and David Arthur, Upper Canada College, Toronto, Ontario; James Lee, Eric Hamber Secondary School, Vancouver, British Columbia; David Nicholson, Fenelon Falls Secondary School, Ontario; and David Pritchard, Woburn Collegiate Institute, Scarborough, Ontario.

The Team Leader was Edward Barbeau (University of Toronto), the Deputy Team Leader Arthur Baragar, (University of Nevada - Las Vegas and a member of Canada's first IMO team in 1981), and the Deputy Team Leader - Observer was Dorette Pronk (Dalhousie University and Calvin College, Michigan).

A number of events were held prior to the team's departure to Bucharest. A reception was held at The Bank of Montreal Institute for Learning in Toronto on June 29, 1999, where the team was introduced to the media and invited guests. Then a two week training camp was hosted at the University of Waterloo from June 30 - July 11 (see below).

At the Awards Ceremony in Bucharest, Bronze Medals were awarded to David Arthur, Jimmy Chui and David Pritchard. More information is available from the press releases (<http://www.camel.math.ca/New/>) and an article by Ed Barbeau in the November 1999 edition of the CMS Notes (<http://www.camel.math.ca/CMS/Notes/>).

IMO Training Camps

Two training camps are held each year to prepare students for the IMO. The CMS Winter IMO Training Camp, held in January, is used to begin the training for the IMO and to let the team leaders meet those students who have a good chance of making the IMO team. The CMS Summer IMO Training Camp is used for intensive training of the actual IMO team.

The 1999 Winter IMO Training camp took place at York University from January 7 to January 10. Students were selected on the basis of their performance in a variety of competitions. The camp featured a group of 14 students from across the country as well as a team of trainers and support people: Ed Barbeau, Arthur Baragar and Dorette Pronk (the team leaders), Bill Sands (University of Calgary, Chair of the IMO committee), and Felix Recio.

The 1999 Summer IMO Training camp took place in Waterloo from June 30 to July 12. The coaches were: Ed Barbeau, Arthur Baragar and Dorette Pronk, as well as Christopher Small (Team Leader in 1998), Richard Hoshino (a member of the 1996 IMO Team), and Ed Wang (Wilfred Laurier University). Peter Crippin (University of Waterloo) made the local arrangements.

Mathematical Olympiads' Correspondence Program

The Mathematical Olympiads' Correspondence Program (MOCP) is a problems based correspondence program. It is intended for Canadian (or Permanent Resident) high school students with exceptional mathematical ability who wish to pursue mathematical problem solving at a high level and/or have ambitions to compete in Mathematical Olympiads. Edward Barbeau has been the coordinator of this programme for many years. He sends out problem sets and marks (with copious comments) the solutions returned by the students. During 1998-99, 21 students participated and about 50 students are registered for the 1999-2000 year.

ESSO Math Camps

The Imperial Oil Charitable Foundation generously agreed to be the Title sponsor of a series of "Esso Math Camps". During June 19-25, 1999 the second CMS National Math Camp took place at the University of Waterloo. Seventeen students from across the country attended. The camp was organized and run by Tom and Marlene Griffiths, Richard Hoshino, Adam Brown and Wai Ling Yee, with the help of a number of the IMO alumni who were in the Waterloo area.

In addition to the National Math Camp two ESSO Math Camps were held at The University of Calgary and the University of Western Ontario. The University of Calgary ran a week long residential camp from July 17-23. A total of 28 students attended the camp. These students came from across Western Canada. The camp was organized and run by Bill Sands (University of Calgary) with the help of many Calgary faculty, staff, teachers, students and others.

The University of Western Ontario ran a three day "day camp" (the students went home each evening) August 10,11,12, with 20 students from the London area participating. This camp was organized by Richard Kane (University of Western Ontario), with the help of other faculty from UWO and teachers from the London area.

More detailed reports on these camps are available.

For the year 2000, the Society plans to increase the number of ESSO Math Camps. Currently, there will be a National Camp at the University of Western Ontario (organized by Tom Griffiths), and regional camps at Dalhousie University, the University of New Brunswick, Brebeuf College (Montreal), the University of Ottawa, Brock University, the University of Western Ontario, the University of Regina and the University of Calgary.

The Canadian Open Mathematics Challenge

The COMC is a math contest written in November of each year. Although it is the last MCC event of the calendar year (and hence of this report) it is the first scheduled MCC event of the academic year. The COMC provides mathematical enrichment for a large number of students and serves as a qualifying paper for the Canadian Mathematical Olympiad (CMO). The results are also considered for the selection of students to the IMO winter training camp. Plaques are awarded to both the students and schools for being a provincial or regional winner and Gold Medals are awarded to up to 9 other students in each province or region.

The fourth COMC was held on November 25, 1999. Almost 5000 students participated. This was a substantial increase from last year, when about 3200 students participated. For a list of the regional and provincial winners, please see the press releases (<http://www.camel.math.ca/New/>) and the COMC web page (<http://www.camel.math.ca/CMS/Competitions/COMC>).

As the increase in the number of students participating shows, the COMC is going well. Schools and provincial governments seem to like the opportunity to see how their top students fair on a national basis. The Society's increased interest in students (including the COMC and Math Camps) is reaping various rewards.

As I hope this report shows, the MCC is a very active committee. I wish to thank all of the members of the MCC and its subcommittees for their time and effort. As many know, the CMS is a society of volunteers. Members of the MCC contribute large amounts of time to make our events run smoothly. I must also thank the staff of the CMS Executive Office and the Executive Director, Graham Wright. They perform much of the administrative work for the MCC and its sub-committees and ensure seamless transition as chairs and membership changes.

Nominating

Ken Davidson (Waterloo) Chair

Edward Barbeau (Toronto)

Jonathan Borwein (Simon Fraser)

Steven Boyer (UQAM)

Katherine Heinrich (Regina)

Richard Kane (Western)

Anthony Lau (Alberta)
Wendy MacCaul (St. Francis Xavier)

In addition to all the vacancies on various standing committees being filled, the terms of reference for the new Endowment Grants Committee and the Student Committee were approved.

The Board approved the dissolution of the Government Policy Committee. The major responsibilities of this Committee over the past few years has been the Annual Survey of the Mathematics Profession in Canada and providing representatives to attend the meetings of several organizations located in the Ottawa area. These responsibilities will be re-assigned to particular individuals appointed by the Executive Committee. In accordance with a broader mandate, the name of the Mathematical Olympiads Committee has been changed to Mathematical Competitions Committee. The terms of reference of a number of standing committee were modified to more accurately reflect the current situation.

A complete slate for the Endowment Grant Committee was approved by the Board of Directors in June in time for the first Endowment Grants Competition to take place in the fall of 1999.

The membership of the Student Committee is subject to the approval of the Nominating Committee and all vacancies were filled effective September 1, 1999.

Publications

James Mingo (Queen's) Chair
Gerald Cliff (Alberta)
Bradd Hart (McMaster)
Anthony Pierce (UBC)
Thomas Salisbury (York)
Christine Soteros (Saskatchewan)
Richard Wood (Dalhousie)

The Publications Committee oversees the publishing activities of the Society. The publications of the Society together with their Editors-in-Chief are:

Canadian Journal of Mathematics - J. Carrell and N. Ghousoub (UBC)

Canadian Mathematical Bulletin - M. Min-Oo and A. Nicas (McMaster)

Crux Mathematicorum with Mathematical Mayhem - Bruce Shawyer (Memorial)

CMS Book Series - J. Borwein and P. Borwein (SFU)

Conference Proceedings Series - A. Geramita (Queen's) and N. Kamran (McGill)

CMS Notes - P. Fillmore and S. Swaminathan (Dalhousie)

A Taste of Mathematics - R. Nowakowski (Dalhousie)

The G. de B. Robinson Prize

This prize is awarded each year for an outstanding article published in one of the Society's two research journals; in even numbered years the prize is awarded for an article published in the Canadian Journal of Mathematics and in odd numbered years for an article published in the Canadian Mathematical Bulletin.

The jury recommended that no award be made this year.

On-line Journals

When in final form, CJM/CMB articles will be posted CJM/CMB web pages in the free area. They will remain there until the number in which they appear is printed.

CMS Advanced Book Series

The contract with Springer Verlag as the new publisher of the CMS Book Series was finalized and several manuscripts have been accepted for publication. The first books in this new series should be released early in 2000.

Conference Proceedings Series

In mid-1999, the publisher of the series, the American Mathematical Society, gave notice that it wishes the discontinue publishing the series. The Committee is exploring ways to keep the series going as an electronic publication.

In the meantime, the Committee gave its approval to a new series of lecture notes and short monographs. The American Mathematical Society has given approval in principle to publish the series. A contract is being negotiated.

Editorial Appointments

The Publications Committee approved the following appointments and, where necessary, all recommendations were approved by the Board of Directors.

The Editorial Board for the Canadian Journal of Mathematics and Canadian Mathematical Bulletin - Associate Editors: Martin Barlow (UBC), Peter Borwein (SFU), Nicholas Pippenger from January 2000 to December 2004.

Canadian Mathematical Bulletin - Editors-in-Chief James Lewis (Alberta), Arturo Pianzola (Alberta) and Noriko Yui (Queen's) from January 2001 to December 2005.

CMS Notes - Editors-in-Chief P. Fillmore and S. Swaminathan (Dalhousie) from January 2001 to December 2002.

A Taste of Mathematics - Associate Editor Katherine Heinrich (Regina), from January 2000 to December 2004.

Crux Mathematicorum with Mathematical Mayhem - Editorial Board Bruce Shawyer (Memorial) - Editor-in-Chief and Clayton Halfyard (Memorial) - Associate Editor from January 2001 to December 2002 and Bruce Gilligan, Articles Editor from January 2000 to December 2004.

Research

Niky Kamran (McGill) Chair

Martin Barlow (UBC)

François Bergeron (UQAM)

Jacques Hurtubise (McGill)

V. Kumar Murty (Toronto)

Ian Putnam (Victoria)

Dana Schlomiuk (Montreal)

Cameron Stewart (Waterloo)

The 1999 Summer Meeting of the CMS was held in St. John's Newfoundland, and was hosted by Memorial University. There were the following research sessions: Perspectives in Ring Theory, organized by Eric Jespers (Brussels) and Edgar Goodaire (Memorial), Harmonic Analysis, organized by Kathryn Hare (Waterloo) and supported by CRM, Representation Theory, organized by Abraham Broer (Montreal) and supported by the Fields Institute, Combinatorics and its Applications, organized by Nabil Shalaby (Memorial) and Douglas Stinson (Waterloo), Nonlinear Analysis, organized by S. P. Singh and Bruce Watson (Memorial), Surveys in Mathematics, organized by Kumar Murty (Toronto) and Niky Kamran (McGill). The Jeffery-Williams Prize Lecturer was John Friedlander (Toronto) and the Krieger-Nelson Prize Lecturer was Nicole Tomczak-Jaegermann (Alberta). The research plenary lectures were given by Michel van den Bergh (VUB, Brussels), Raneé Brylinski (Penn State), Tom Korner (Cambridge), Doug Stinson (Waterloo) and Luc Vinet (Montreal).

The Research Committee met in Saint John's and selected the four core CMS sessions for the Summer 2001 meeting, to be held in Saskatoon. This was done in consultation with Keith Taylor, who will be serving as the Meeting Director.

The 1999 Winter Meeting of the CMS was held in Montreal, and hosted by the Université de Montreal. There were the following research sessions: Algebraic Combinatorics, Group Representations and Macdonald Polynomials, organized by François Bergeron (UQAM), Nantel Bergeron (York) and Mike Zabrocki (UQAM) and supported by CRM and LaCIM, Mathematical Physics I. Probability Methods and Applications, II. Group Theory Methods and Applications, organized by George Bluman (UBC), Michel Grundland (UQTR and CRM), and Gordon Slade (UBC) and supported by PImS, Orders, Lattices and Universal Algebra, organized by Lucien Haddad (Royal Military College, Kingston), Benoit Larose (College regional Champlain, Longueuil) and Ivo Rosenberg (Montreal), Computing and

Mathematical Modelling, organized by Pierre Hansen (HEC) and Gilbert Laporte (CRT) and supported by NCM2, Mathematical Genetics and Genomics, organized by Sabin Lessard and David Sankoff (Montreal) and supported by the Fields Institute, Applied logic, organized by Wendy MacCaull (St-Francis Xavier), Prakash Panangaden (McGill), and Phil Scott (Ottawa), Algebraic and Geometric Methods in Differential Equations, organized by Angelo Mingarelli (Carleton) and Christiane Rousseau (Montreal) and supported by CRM. The Coxeter-James Prize Lecturer was Maciej Zworski (Berkeley and Toronto). The Doctoral Prize lecture was given by Jian Shen (Queen's). The research plenary lectures were given by Andreas Dress (Bielefeld), Adriano Garsia (UCSD), Elliot H. Lieb (Princeton) and Zhihong Xia (Northwestern and Georgia Tech).

The Research Committee met in Montreal and selected the four core sessions for the Winter 2001 meeting, to be held at York University. This was done in consultation with Tom Salisbury, who will be serving as the Meeting Director.

The next meetings of the CMS will be held in Hamilton (McMaster) in Summer 2000, Vancouver (UBC) in Winter 2000, Saskatoon (Saskatchewan) in Summer 2001 and Toronto (York) in the Winter of 2001.

Student

Daniel Piché (Waterloo) Chair

Susan Cooper (Queen's)

Gabriella Couto

Tullia Dymarz

Alexandre Girouard

Andrew Irwin

Robert Juricevic

Dave Morgan

Robert Woodrow (Calgary)

Graham P. Wright (Ottawa)

This is the first annual report of the newly formed Student Committee, which began in September 1999. Our first meeting was held in December 1999, to determine what our objectives should be and what the Committee should focus upon.

The Student Committee is responsible for all aspects of mathematics student affairs. The ones we are focusing upon at present are:

- Development of a national student newsletter
- Development of a student Web site at the CMS
- Supporting the Canadian Undergraduate Mathematics Conference (CUMC), through funding, organisational planning and editing its proceedings
- Supporting regional student initiatives

- Responding to Task Force recommendations on student related issues

We expect that 2000 will be a busy year and that our next report will be longer. At this time I would like to thank the Committee members for giving their time, and their home universities for their support towards our first meeting.

Women in Mathematics

Shelly Wismath (Lethbridge) Chair

Rob Corless (Western)

Nancy Heckman (UBC)

Jennifer Hyndman (UNBC)

Lisa Jeffrey (Toronto)

Keith Taylor (Saskatchewan)

Richard Wood (Dalhousie)

Frank Zorzitto (Waterloo)

The Committee for Women in Mathematics (CWM) is charged with monitoring the status of women within the Canadian mathematical community and the Society, recommending actions to the Board which will ensure the equitable treatment of women there, and encouraging the participation of women at all levels of mathematics.

The main activity of the CWM in 1999 has been on-going work on two projects. The first is the Directory of Canadian

Women in the Mathematical Sciences, a project conceived and started up by former CWM Chair Joan Geramita with funding from Nancy's Very Own Foundation and assistance from Camel. The Directory is an indexed collection of web pages of Canadian-connected women who are actively involved in some aspect of the mathematical sciences. Each web page lists name, address, contact information and research interests for the woman mathematician; she may also provide links to her home page or curriculum vitae if she wishes. With some additional advertising this year (handouts at CMS and other conferences and e-mail letters), we now have 62 women listed in the Directory. The Directory is searchable, for instance by geographical or research area, and should provide a valuable resource for those searching the Web for information about Canadian women mathematicians. Check it out at <http://camel.math.ca/Women/WMpages/>

Our second major project is a poster to celebrate the role of women in mathematics as part of the Mathematics Year 2000 events. Jennifer Hyndman is co-ordinating this project, which will feature the Krieger-Nelson Prize winners.


Frank Zorzitto (Waterloo) joined the committee as of January 1999. Lisa Jeffrey (Toronto) finished her term in December 1999 and will be replaced by Neal Madras (York). Shelly Wismath (Lethbridge) finished her term as Chair of the Committee in December, 1999, but will continue as a member for an additional year. Malgorzata Dubiel (SFU) will take over as Chair January 1, 2000.

New Director of the ISM

Nouveau Directeur à l'ISM

François Lalonde's (UQAM) mandate will end on June 1, 2000, and Peter Russell (McGill) will take over as the new director of the Institut des sciences mathématiques. The ISM coordinates the graduate programs of six Quebec universities (Concordia, Laval, McGill, Montreal, Sherbrooke, UQAM), funds about thirty students and several postdocs, and organizes many scientific activities for the mathematical community. The Institute's office is at UQAM.

Le mandat de François Lalonde (UQAM) se terminera le 1er juin 2000 et Peter Russell de l'Université McGill deviendra alors le nouveau directeur de l'Institut des sciences mathématiques (ISM). L'ISM coordonne les programmes de cycles supérieurs de six universités québécoises (Concordia, Laval, McGill, Montréal, Sherbrooke, UQAM), soutient financièrement une trentaine d'étudiants ainsi que plusieurs stagiaires postdoctoraux, et organise un ensemble d'activités scientifiques pour la communauté mathématique. Le secrétariat de l'Institut se trouve à l'UQAM.

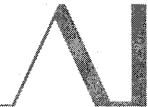


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Evaluation copy also available.

MINUTES OF THE GENERAL MEETING

Salon McGill, Centre de conférence – Renaissance - Hôtel du Parc
Montréal, Québec – December 12, 1999

DRAFT

Pending approval

The meeting opened at 3:30 p.m. with 33 members in attendance.

Adoption of the agenda

The agenda was adopted as circulated, with the additional of a report from CUMC.

Minutes of the previous meeting

G-99-8 (Timourian/Wright)

That the minutes of the Annual General Meeting, held May 30, 1999 at Memorial University of Newfoundland, St. John's, Newfoundland, be accepted. *Carried*

Unanimously

Matters Arising

There were no matters arising from the minutes.

President's Report

WMY2000

The CMS has awarded grants from Endowment Fund to a number of special projects for the World Math Year 2000. These include poster projects, math camps, activities of provincial associations, exhibits, and math trails. Most of the projects have also found other sources and are proceeding.

An application has been made to the Millennium Fund to support three of these activities.

Kane reported that Arthur Sherk has recently been diagnosed with cancer. Both the Board and the Executive have sent cards expressing their best wishes.

Executive Director and Secretary's Report

Wright summarized the activities reported on to the Board and the Executive Committee.

In 1999, there were three pilot math camps at Calgary, Waterloo and Western Ontario. Next year's camps have received increased funding and a larger number of universities are planning camps.

Treasurer's Report

The 2000 budget has received approval of the Board of Directors and was circulated for information. The year-end estimates is projected to be a deficit of approximately \$16,500.

Reports from Committees

Kane noted special thanks to the outgoing chairs: Morris Orzech, Ken Davidson, Gordon Mason, Shelley Wismath, and David Poole. The Society is very grateful for their excellent work.

Endowment Grants:

The deadline for applications was September 30, 1999. Thirteen applications were received, mostly electronically. The first round of applications was a learning exercise and the Committee hopes to introduce a number of improvements in the application procedure for next year. Announcements will be made in early January. The materials on the web will be updated in February.

Women in Mathematics:

The Directory project on Camel is progressing. The poster project is underway but the Committee is awaiting the result of the Millennium Fund application. The poster should be ready in 2000.

Students:

The Committee was established September 1 and has since put together a budget and an Endowment Fund Application. The Committee consists of 11 members: two undergraduate students, eight graduate students, one faculty advisor, and the CMS Executive Director.

During the coming months, the Committee will focus on developing a newsletter and a student section on Camel. It will also look at a number of the task force recommendations. The Committee will also be consulting with CUMC regarding the publication of proceedings.

Research:

MATH 2000, the upcoming June meeting at McMaster, has a vast scientific programme, including 19 sessions and 15 plenary talks, along with numerous satellite events. A poster has been produced and will be sent to mathematics and related departments in Canada and the U.S. It will also be sent to a number of other mathematics organizations and societies.

Publications:

There was no report from the Publications Committee.

Nominating:

A large number of positions have been filled. There are three private sector positions on the Board. As the terms of Rosaria Morelli and Lesya Balych will end December 31, 1999, members were invited to send suggestions of people in the private sector who might be interested in the positions.

Mathematics Competitions:

The fourth COMC was written in November 1999 by approximately 5,000 students, substantially more than ever before.

There are still a number of provinces in which participation is low and the Committee welcomed any ideas to improve that situation. Edward Barbeau, Daryl Tingley and Graham Wright have met with representatives from Quebec to get more information regarding the Quebec system.

Reports of the 1999 CMO are available and work is underway for the 2000 competition.

The 2000 IMO will be held in Korea and the Leader will be Andy Liu. The IMO Winter Training Camp will be held at Trent, with David Poole as coordinator. The Summer IMO Camp will be held at Simon Fraser University in July.

International Affairs:

The agreement between the CMS and the IMU has been renewed. The next IMU is scheduled for 2002.

There was a question regarding whether CMS had been approached about hosting the ICM 2006. Although there has been no formal approaches made, Kane will seek more information on this matter and report back to the members.

Human Rights:

The Committee was pleased to announce the release of Professor Ahn Jae-Ku, who was jailed for life in 1984 in Korea. The CMS was among many organizations that wrote letters of protest to the Korean government. It was noted that the release of Prof. Jae-Ku occurred after the change in government in Korea. An article will be published in the *CMS Notes*.

Fund Raising:

Kane reported that applications to government sponsors focus on the students that are affected by our activities. The funding for 2000 should remain stable.

Corporate sponsorship is new to the CMS. Last year, corporate sponsorships totalled \$30,000, of which \$22,000 was new money. Wright noted that the 2000 budget anticipates we will raise an additional \$60,000 in new funds. We already have a good start on the goal, as Imperial Oil has increased its donation by \$10,000. The sponsorship levels have been adjusted to more clearly outline the levels and corresponding benefits of sponsorship.

It was pointed out that, as the number of sponsors grow, there may be an issue with the membership's point of view regarding certain companies that might be inappropriate. Wright noted that the Committee does have regional representatives, and, like all members of the committee, they may voice any doubts regarding particular companies being approached. Sawyer reminded members that the 1995 IMO could not have taken place without corporate sponsorship, but that the IMO Board was very careful about who they approached. What is clear, however, is that there is a need to acknowledge large donations in a very public way.

Another member noted that there is a line between advertising and donations which should be distinct.

Other fund raising initiatives include a membership drive, with many new options, including complimentary membership for graduate students. The Society is reaching out to

students, offering a number of new services, including travel money to attend CMS meetings, job fairs, and more.

As always, CMS members have been very generous with their contributions. In 1998, individual members donated \$6,200. So far this year, individual members have donated more than \$8,000.

Finance Committee:

The Finance Committee has three main functions: it prepares the budget, it oversees investments, and it reviews audited statements. Recently, with the Society adopting a passive investment strategy, the CMS investments have been transferred to TD Quantitative Capital. The combined investments of all the funds is \$1.75 million. The Investment Advisory Group has been dissolved, and the Finance Committee will now oversee the investment portfolio.

The 2000 membership renewal campaign is underway and members will note that membership fees no longer qualify for income tax receipts.

Electronic Services:

The Camel web site has now taken on a new look and Goodaire invited all members to visit camel.math.ca to see the new look. The management of the sites are also undergoing a change, with a number of the administrative aspects of Camel being transferred from Camel West (Simon Fraser) to Camel East (Executive Office). Camel West will maintain the digital side of the publications while the maintenance and accounts will be handled in Ottawa. Goodaire expressed the Committee's thanks to Loki Jörgenson and Alan Kelm for their work.

Camel Services have undergone a thorough review. The ESC is downsizing to a smaller committee, eliminating many ex-officio positions. It has been asked to examine a number of specific issues before April. Goodaire thanked the ex-officio members from the various committees for their very valuable input over the last few years.

Education:

As his term as Chair was coming to an end, Orzech thought it a good time to reflect on the recent work of the Education Committee, its successes and issues the Committee still feels need development.

The sessions for Summer 2000 and Winter 2000 are in development. The Committee is very pleased with the development and direction of the education sessions.

Regarding future development, the Executive has before it a motion to develop an Education web page editor. It is hoped that some mechanism can be developed to increase the amount of Education information on Camel.

Orzech also hoped that Ph.D. students in mathematics education could be added to the list of those being offered free memberships to the CMS.

He noted that Ed Dubinsky of the MAA attended this meeting. The Education Committee hopes that this kind of representation from the MAA would continue.

In closing, Orzech thanked Graham Wright, Richard Kane and the President's delegate for their input during his term as Chair.

Reports from the Task Forces:

Of the task forces, three have already reported, and three have submitted reports during this meeting. All six of these reports will shortly be on Camel and Committees have been asked to examine and comment on the numerous Task Force recommendations.

The report from the Task Force on Publications is due in June 2000 and the Task Force on Office Strategies is still working.

Other Business

- The members expressed a special vote of thanks to Michel Delfour and Veronique Hussin for all their ex-

cellent work in organizing the 1999 CMS Winter Meeting.

- Borwein reported that one of the consequences of participating in the IMU is our involvement in the newly-formed International Committee on Electronic Communication and Information. The Committee is looking at three main issues: intellectual property and copyright, preprint access, and archiving and pricing issues. Borwein confirmed that the work of the committee was very exciting, with participants dealing with these important issues at a very advanced but realistic level.

Adjournment

The meeting adjourned at 4:49 p.m.

CALL FOR NOMINATIONS / APPEL DE CANDIDATURES

Coxeter-James / Jeffery-Williams / Krieger-Nelson Prize Lectureships

Prix de conférence Coxeter-James / Jeffery-Williams / Krieger-Nelson

The CMS Research Committee invites nominations for three prize lectureships.

The Coxeter-James Prize Lectureship recognizes outstanding young research mathematicians in Canada. The selected candidate will deliver the prize lecture at the Winter 2001 Meeting in Toronto, Ontario. Nomination letters should include at least three names of suggested referees.

The Jeffery-Williams Prize Lectureship recognizes outstanding leaders in mathematics in a Canadian context. The prize lecture will be delivered at the Summer 2002 Meeting in Québec City, Québec. Nomination letters should include three names of suggested referees.

The Krieger-Nelson Prize Lectureship recognizes outstanding female mathematicians. The prize lecture will be delivered at the Summer 2002 Meeting in Québec City, Québec. Nomination letters should include three names of suggested referees.

The deadline for nominations is **September 1, 2000**. Letters of nomination should be sent to:

Le Comité de recherche de la SMC invite les mises en candidatures pour les trois prix de conférence de la Société.

Le prix Coxeter-James rend hommage à l'apport exceptionnel des jeunes mathématiciens au Canada. Le candidat choisi présentera sa conférence lors de la réunion d'hiver 2001 à Toronto (Ontario). Les lettres de candidatures devraient inclure les noms d'au moins trois répondants possibles.

Le prix Jeffery-Williams rend hommage à l'apport exceptionnel des mathématiciens d'expérience au Canada. La Conférence sera présentée lors de la réunion d'été 2002 au Québec (Québec). Les lettres de candidature devraient inclure les noms d'au moins trois répondants possibles.

Le prix Krieger-Nelson rend hommage à l'apport exceptionnel des mathématiciennes au Canada. La Conférence sera présentée lors de la réunion d'été 2002 au Québec (Québec). Les lettres de candidatures devraient inclure les noms d'au moins trois répondants possibles.

La date limite est **le 1 septembre 2000**. Les lettres de mises en candidatures devraient être envoyées à :

Dr. Ian Putnam
CMS Research Committee / Comité de recherche de la SMC
Department of Mathematics and Statistics
University of Victoria
Victoria, British Columbia
V8W 3P4

CMS Winter Meeting 2000 December 10-12

**Hotel Vancouver
Vancouver, B.C.**

We are happy to announce the provisional outline for the meeting. Look for the First Announcement in the September 2000 issue of the *CMS Notes* or at <http://www.cms.math.ca/Events/winter00>.

HOST : Department of Mathematics, University of British Columbia.

PUBLIC LECTURE : **Roger Howe** (Yale). The lecture will be held at UBC's Instructional Resources Centre at 8:15 p.m. on December 9, 2000. The Public Lecture is co-sponsored by the Vancouver Institute.

PLENARY SPEAKERS : **Patrick Dehornoy** (Caen), **Richard Durrett** (Cornell), **Roger Howe** (Yale) - Education plenary, **Izabella Laba** (UBC), **Stanley Pliska** (UI Chicago), **Paul Roberts** (Utah).

PRIZE LECTURES : Coxeter-James Lecture, Doctoral Award Lecture.

SYMPOSIA : **Algebraic Geometry**, Org: Peter Russell (McGill); **Classical and Computational Analysis**, Org: Peter Borwein (SFU); **Financial Mathematics**, Org: Abel Cadenillas (Alberta) and Ulrich Haussmann (UBC); **History of Mathematics**, Org: Len Berggren (SFU); **Mathematical Education**, Org: George Bluman (UBC) and Klaus Hoechsmann (UBC); **Number Theory**, Org: Rajiv Gupta (UBC) and Nike Vatsal (UBC); **Operator Algebras**, Org: Michael Lamoureux (Calgary) and Ian Putnam (Victoria); **Ordered Groups**, Org: Akbar Rhemtulla (Alberta); **Partial Differential Equations**, Org: Richard Froese (UBC), Nassif Ghoussoub (UBC) and Izabella Laba (UBC); **Probability Theory**, Org: Martin Barlow (UBC) and Edwin Perkins (UBC).

MEETING DIRECTOR : Dale Rolfsen (UBC).

LOCAL ARRANGEMENTS : Martin Barlow (UBC) and Afton Cayford (UBC).

Réunion d'hiver 2000 de la SMC du 10 au 12 décembre

**Hotel Vancouver
Vancouver (C.-B.)**

Voici le programme provisoire de la Réunion. La première annonce paraîtra dans le numéro de septembre 2000 des *Notes de la SMC* et sur notre site Web: <http://www.cms.math.ca/Events/winter00>.

HÔTE : Département de mathématiques, Université de la Colombie-Britannique (UBC).

CONFÉRENCE PUBLIQUE : **Roger Howe** (Yale). La conférence aura lieu au "Instructional Resources Centre" de l'Université de la Colombie-Britannique, le 9 décembre 2000 à 20 h 15. La conférence est présentée avec la participation du Vancouver Institute.

CONFÉRENCIERS PRINCIPAUX : **Patrick Dehornoy** (Caen), **Richard Durrett** (Cornell), **Roger Howe** (Yale) - Éducation, **Izabella Laba** (UBC), **Stanley Pliska** (UI Chicago), **Paul Roberts** (Utah).

CONFÉRENCES DES LAURÉATS : Conférence Coxeter-James, Prix de doctorat.

SYMPOSIUMS : **Géométrie algébrique**, Org: Peter Russell (McGill); **Analyse classique et quantitative**, Org: Peter Borwein (SFU); **Mathématiques financières**, Org: Abel Cadenillas (Alberta) et Ulrich Haussmann (UBC); **L'histoire des mathématiques**, Org: Len Berggren (SFU); **Enseignement des mathématiques**, Org: George Bluman (UBC) et Klaus Hoechsmann (UBC); **Théorie des nombres**, Org: Rajiv Gupta (UBC) et Nike Vatsal (UBC); **Algèbres des opérateurs**, Org: Michael Lamoureux (Calgary) et Ian Putnam (Victoria); **Groupes ordonnés**, Org: Akbar Rhemtulla (Alberta); **Équations aux dérivées partielles**, Org: Richard Froese (UBC), Nassif Ghoussoub (UBC) et Izabella Laba (UBC); **Théorie des probabilités**, Org: Martin Barlow (UBC) et Edwin Perkins (UBC).

DIRECTEUR DE RÉUNION : Dale Rolfsen (UBC).

LOGISTIQUE LOCALE : Martin Barlow (UBC) et Afton Cayford (UBC).

CALL FOR SESSIONS / APPEL AUX COMMUNICATIONS

Additional self-supported sessions play an important role in the success of the Society's semi-annual meetings. The CMS welcomes and invites proposals for self-supported sessions for Summer 2001 (University of Saskatchewan, Saskatoon, Saskatchewan) and Winter 2001 (York University Toronto, Ontario).

Proposals should include a brief description of the focus and purpose of the session, the number and expected length of the talks, as well as the organizer's name, complete address, telephone number, e-mail address, etc. Although such sessions would not usually have a plenary speaker, any special situations are left to the discretion of the Meeting Director.

These additional sessions will be incorporated with the other sessions, time blocks allocated by the Meeting Director and advertised in the *CMS Notes*, on *Camel* and, if possible, in the *Notices of the AMS* and in publications of other societies. Speakers in these additional sessions will be requested to submit abstracts which will be published in the meeting programme.

The following provides information on the sessions confirmed to date.

Those wishing to organize a session should send a proposal to the Meeting Director by the deadlines below.

Les sessions autofinancées contribuent de plus en plus au succès des réunions semi-annuelles de la Société. La SMC encourage ces initiatives et invite les organisateurs(trices) potentiel(les) à soumettre leurs projets pour ce type de sessions à l'occasion de la réunion d'été 2001 (Université de Saskatchewan, Saskatoon, Saskatchewan) et la réunion d'hiver 2001 (York Université, Toronto, Ontario).

Les projets doivent inclure une brève description du thème et de la motivation de la session, le nombre et la durée des communications prévues, ainsi que le nom et les coordonnées physiques et électroniques de l'organisateur(trice). Ces sessions ne comprennent pas non seulement de conférence plénière, mais les situations particulières sont laissées à la discrétion du directeur de la réunion.

Ces sessions additionnelles feront partie du programme, leur horaire sera établi par le directeur de la réunion, et elles seront publicisées dans les *Notes de la SMC*, sur *Camel* et, si possible, dans les *Notices de l'AMS* et les publications d'autres sociétés. Les conférenciers devront soumettre un résumé de leur communication, que paraîtra dans le programme de la réunion.

Toute personne désireuse d'organiser une session doit faire parvenir un projet au directeur de réunion avant les dates dessous

Summer 2001 / Été 2001

Deadline / Date limite: June 30, 2000 - le 30 juin 2000

Abstract Harmonic Analysis

K. Taylor (Saskatchewan)

Geometric Topology

A. Chigogidze and E. Tymchatyn (Saskatchewan)

Infinite dimensional Lie theory and representation theory

S. Berman (Saskatchewan)

Model theoretic algebra

B. Harte, F.-V. Kuhlmann and S. Kuhlmann (Saskatchewan)

Rigorous studies in the statistical mechanics of lattice models

Chris Soteros (Saskatchewan) and S.G. Whittington (Toronto)

Scattering theory and integrable systems

J. Szmigielski (Saskatchewan)

Keith Taylor, Meeting Director

Department of Mathematics and Statistics

University of Saskatchewan

McLean Hall, 106 Wiggins Road

Saskatoon, Saskatchewan Canada S7N 5E6

Tel: (306) 966-6100 Fax: (306) 966-6086

e-mail: taylor@math.usask.ca

Winter 2001 / Hiver 2001

Deadline / Date limite: October 15, 2000 - le 15 octobre 2000

Dynamical Systems

Bill Langford (Guelph) and/ et Jianhong Wu (York)

Free Probability

Andu Nica (Waterloo)

Kac-Moody Lie Algebras

Yun Gao (York) and Nantel Bergeron (York)

Non-linear Analysis

Robert McCann (Toronto)

Tom Salisbury, Meeting Director

Department of Mathematics and Statistics

York University

N520 Ross, 4700 Keele Street

Toronto, Ontario Canada M3J 1P3

Tel: (416) 736-5250 Fax: (416) 736-5757

e-mail: salt@pascal.math.yorku.ca

Asymptotic Series, Differential Algebra and Finiteness Problems in Non-Linear Dynamical Systems – June 19 – July 7, 2000

While the relationship between asymptotic analysis and differential algebra has a long history in linear differential equations, the merger of tools and openings of a wider scope of investigations in both areas of non linear dynamics and differential algebraic geometry is more recent. In particular, model theoretical methods have recently come to the fore. These new developments provide ample motivation for organizing a workshop in this area of research.

The goal of this workshop is to bring together researchers in these fields so as to promote new research and collaboration. Plenty of time will be reserved for discussion.

MINI COURSES

June 19-30

Aimed at graduate students and potential researchers

A. Bolibruch "Asymptotic series and differential equations"

A. Buium "Differential algebraic geometry and diophantine geometry"

L. van den Dries "Logarithmic-exponential series and minimality"

V.Y. Kaloshin "Finiteness theorems in dynamical systems"

INVITED SPEAKERS AND PARTICIPANTS

M. Aschenbrenner, A. Bolibruch, A. Buium, F. Dumortier (*), J.-P. Francoise, Y. Ilyashenko (*), V.Y. Kaloshin, J.-M. Lion, J. Llibre, A. Macintyre, F. Menous, C. Miller, A. Mourtada, R. Moussu(*), D. Novikov, A. Pillay, J.-P. Rolin, C. Rousseau, P. Speissegger, B. Vallet, L. van den Dries, J. van der Hoeven, S. Yakovenko (*): to be confirmed.

ORGANIZERS

Dana Schlomiuk

Universite de Montreal, dasch@dms.umontreal.ca.

Luc Belair

Universite du Quebec a Montreal - UQAM,

belair.luc@uqam.ca.

REGISTRATION

Please register by May 19, 2000 for attendance and accommodation, or June 2, 2000 for attendance only.

A registration form is available at URL :
http://www.CRM.UMontreal.CA/act/form/inscr_2000-2001_hors_fr.shtml

One Hundred Years of L'Enseignement Mathématique : Announcement of a Symposium

The well-known international journal *L'Enseignement Mathématique* was established in 1899 by Henri Fehr and Charles Laisant. The idea of internationalism in mathematics education, crucial to the journal right from its beginning, led a few years later to the creation of the International Commission on Mathematical Instruction during the 1908 International Congress of Mathematicians in Rome. *L'Enseignement Mathématique* has been the official organ of ICMI ever since that time. During these one hundred years, mathematics education has undergone profound changes marked by decisive developments in the evolution of mathematics and in the organization and structure of the school systems throughout the world.

On the occasion of the centennial of the journal, it was felt appropriate to hold a symposium with the aims of looking at the evolution of mathematics education over the last century and identifying some guidelines and trends for the future, taking into account, among other sources, the documents, debates and related papers having appeared in *L'Enseignement Mathématique*. The emphasis of the symposium is on secondary education (students in the age range of about 12 to 18 or 19 years). In addition to proposing a reflection on the history of mathematics education and the evolution of mathematics and

its teaching and learning in the 20th century, the symposium also gives the opportunity of a gathering of some of the main actors, during the last decades, in mathematics education as considered from an international perspective. The symposium should thus be seen as an international meeting of all those interested in mathematics education and its evolution.

Organized jointly by ICMI and the University of Geneva as a contribution to the celebration of the World Mathematical Year 2000, this symposium will take place in Geneva, the home of the journal since its birth, from Friday October 20 to Sunday October 22, 2000. The theme of the meeting is

One Hundred Years of L'Enseignement Mathématique : Moments of Mathematics Education in the 20th Century

The program of the symposium is based on a series of invited talks. Among the themes are: issues in mathematics education at the time the journal was born; evolutions and permanences in the needs, practices and issues in the teaching of geometry, analysis and applications of mathematics over the last century; stakes in mathematics education yesterday, today and tomorrow. Ample time will be devoted during the symposium to collective discussions on the themes presented in the talks. More information about the program can be obtained on the ICMI website: <http://elib.zib.de/IMU/ICMI/>

The members of the Program Committee of this symposium are Daniel Coray (Switzerland), Fulvia Furinghetti (Italy), H el ene Gispert (France), Bernard R. Hodgson (Canada) and Gert Schubring (Germany).

The philosophy of discussions and personal exchanges underlying this symposium imposes a limitation on the numbers of participants. People interested in the symposium are thus requested to contact the Local Organizing Committee at the address below as soon as possible, preferably prior to July 15. Participants are expected to stay for the three days of the meeting (starting on Friday morning and ending on Sunday at noon). There will be no registration fee, but

very little financial support is available. Hence foreign participants are expected to cover their travel and local expenses by themselves or through their home institution.

Information about local facilities (hotels, etc.) can be obtained from the Local Organizing Committee.

Contact:

Local Organizing Committee

Symposium EM-ICMI

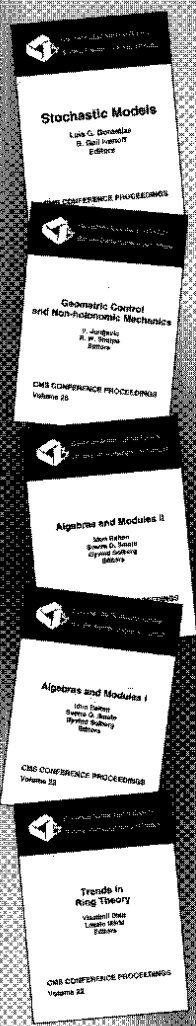
Case postale 240

CH-1211 Gen ve 24, Suisse

e-mail: EM-ICMI <EnsMath@math.unige.ch>

AMERICAN MATHEMATICAL SOCIETY

Conference Proceedings, Canadian Mathematical Society



This series is published for the Canadian Mathematical Society by the AMS. It consists of the proceedings of internationally attended conferences on pure and applied mathematics sponsored by the CMS. **CMS members may order at the AMS member prices.** (ISSN 0731-1036) Softcover.

Stochastic Models

Luis G. Gorostiza, Centro de Investigacion and de Estudios Avanzados, Mexico City, Mexico, and B. Gail Ivanoff, University of Ottawa, ON, Canada, Editors

This book presents the refereed proceedings of the International Conference on Stochastic Models held in Ottawa (ON, Canada) in honor of Professor Donald A. Dawson. Contributions to the volume were written by students and colleagues of Professor Dawson, many of whom are eminent researchers in their own right.

A main theme of the book is the development and study of the Dawson-Watanabe "superprocess", a fundamental building block in modelling interaction particle systems undergoing reproduction and movement. The volume also contains an excellent review article by Professor Dawson and a complete list of his work.

This comprehensive work offers a wide assortment of articles on Markov processes, branching processes, mathematical finance, filtering, queueing networks, time series, and statistics.

Conference Proceedings, Canadian Mathematical Society, Volume 26; 2000; 450 pages; Softcover; ISBN 0-8218-1063-4; List \$99; Individual member \$59; Order code CMSAMS/26CMS00

Algebras and Modules II

Idun Reiten, Sverre O. Smal , and Øyvind Solberg, Norwegian University of Science and Technology, Trondheim, Editors

This volume contains 43 research papers based on results presented at the Eighth International Conference on Representations of Algebras (ICRA VIII) held in Geiranger, Norway. The papers, written by experts in the field, cover the most recent developments in the representation theory of artin algebras and related topics.

Volume 24; 1998; 569 pages; Softcover; ISBN 0-8218-1076-6; List \$99; Individual member \$59; Order code CMSAMS/24CMS00

Geometric Control and Non-holonomic Mechanics

V. Jurdjevic and R. W. Sharpe, University of Toronto, ON, Canada, Editors

Control theory, a synthesis of geometric theory of differential equations enriched with variational principles and the associated symplectic geometry, emerges as a new mathematical subject of interest to engineers, mathematicians, and physicists. This collection focuses on several distinctive research directions having origins in mechanics and differential geometry, but driven by modern control theory.

The first of these directions deals with the singularities of small balls for problems of sub-Riemannian geometry and provides a generic classification of singularities for two-dimensional distributions of contact type in a three-dimensional ambient space.

The second direction deals with invariant optimal problems on Lie groups exemplified through the problem of Dublins extended to symmetric spaces, the elastic problem of Kirchhoff and its relation to the heavy top. The results described in the book are explicit and demonstrate convincingly the power of geometric formalism.

The remaining directions deal with the geometric nature of feedback analyzed through the language of fiber bundles, and the connections of geometric control to non-holonomic problems in mechanics, as exemplified through the motions of a sphere on a surface of revolution.

This book provides quick access to new research directions and also demonstrates the effectiveness of new insights and methods that control theory brings to mechanics and geometry.

Conference Proceedings, Canadian Mathematical Society, Volume 25; 1996; 239 pages; Softcover; ISBN 0-8218-0795-1; List \$49; Individual member \$29; Order code CMSAMS/25CMS00

Algebras and Modules I

Idun Reiten, Sverre O. Smal , and Øyvind Solberg, Editors

This volume contains recent results on geometric aspects of representations of algebras, a thorough treatment of the theory of quasifinite algebras, new developments on infinite dimensional representations of finite dimensional algebras, a bridge between representation of algebraic groups and representation theory of finite dimensional algebras, and recent discoveries on modular representation theory. In addition, the volume contains two papers devoted to some of Maurice Auslander's many contributions both in the representation theory of finite dimensional algebras and in commutative ring theory.

A general background in noncommutative algebra including rings, modules and homological algebra is required. Given that, parts of this volume would be suitable as a textbook for an advanced graduate course in algebra.

Volume 23; 1996; 198 pages; Softcover; ISBN 0-8218-0850-8; List \$39; Individual member \$25; Order code CMSAMS/23CMS00


Trends in Ring Theory

Vlastimil Dlab, Carleton University, Ottawa, ON, and L szl  M rki, Hungarian Academy of Sciences, Budapest, Editors

The Ring Theory Conference (University of Miskolc, Hungary) successfully accomplished its two goals: 1) to reflect contemporary trends in the subject area and 2) to offer a meeting place for a large number of Eastern European algebraists and their colleagues from around the world. Particular emphasis was placed on recent developments in the following four areas: representation theory, group algebras, PI algebras, and general ring theory. This book presents 13 of the invited lectures.

Volume 22; 1996; 239 pages; Softcover; ISBN 0-8218-0849-4; List \$49; Individual member \$29; Order code CMSAMS/22CMS00

All prices subject to change. Charges for delivery are \$3.00 per order. For optional air delivery outside of the continental U. S., please include \$6.50 per item. *Payment required.* Order from: **American Mathematical Society**, P. O. Box 5904, Boston, MA 02206-5904, USA. For credit card orders, fax 1-401-455-4046 or call toll free 1-800-321-4AMS (4267) in the U. S. and Canada, 1-401-455-4000 worldwide. Or place your order through the AMS bookstore at www.ams.org/bookstore/. Residents of Canada, please include 7% GST.



AMS

AMERICAN MATHEMATICAL SOCIETY

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**MCGILL UNIVERSITY – MONTREAL, QUEBEC
DEPARTMENT OF MATHEMATICS AND STATISTICS**

McGill University invites applications to the Department of Mathematics and Statistics from potential nominees for a 2001 NSERC University Faculty Award (UFA). Applicants from all areas of mathematics and statistics as well as those with interdisciplinary interest will be considered. Completed applications must reach NSERC by **November 1, 2000** and therefore are required at McGill as soon as possible and no later than **August 15, 2000**. Successful applicants to the competition will be appointed at the Assistant Professor level (tenure track) in the Department.

Candidates must, by the appointment date, possess a Ph.D. in Mathematics, Statistics or a related field. Relevant postdoctoral experience is an asset. The UFA program aims to increase the representation of women in the sciences; accordingly, the competition is limited to women who have not previously held a tenure track appointment at a Canadian University. Further information on the NSERC University Faculty Award program is available from NSERC at http://www.nserc.ca/programs/sf/UFA_e.htm.

Information on the Department and McGill University can be found at <http://www.math.mcgill.ca>.

In accordance with the terms of the NSERC UFA program, this advertisement is directed only to women who are, or will be by November 1, 2000, Canadian citizens or permanent residents of Canada.

Completed applications will consist of: a full curriculum vitae (including evidence of relevant formal training); statements of teaching specializations, research interests and a research proposal; up to three reprints or pre-prints; three confidential letters of recommendation SENT UNDER SEPARATE COVER BY THE CANDIDATE'S REFERENCES addressing the applicant's teaching and research ability and promise; completed NSERC Personal Data Form (form 100), AND Application for a Grant Form (form 101).

**Direct applications and enquiries to:
Dr. K. GowriSankaran, Chair
Department of Mathematics and Statistics
McGill University
805 Sherbrooke St. West
Montreal, Quebec, Canada H3A 2K6
Phone: (514) 398-7373 Fax: (514) 398-6671
Email: chair@math.mcgill.ca**

**McMASTER UNIVERSITY – HAMILTON, ONTARIO
DEPARTMENT OF MATHEMATICS AND STATISTICS**

The Department of Mathematics & Statistics, McMaster University, invites applications for a faculty position in Mathematics at the rank of PROFESSOR, with anticipated starting date July 1, 2000.

The Professorship will be a tenured appointment in the Department of Mathematics & Statistics. The successful candidate should be internationally recognized for his or her fundamental contributions to research in a major area of APPLIED ANALYSIS, including applications of non-linear partial differential equations, and be actively engaged in significant research projects. The successful candidate should have attracted substantial research grant support and demonstrated leadership in organizing research efforts through the supervision of graduate students and post-doctoral fellows.

The salary will be based on qualifications and experience.

McMaster is committed to Employment Equity and encourages applications from all qualified candidates, including aboriginal peoples, persons with disabilities, members of visible minorities and women.

In accordance with Canadian Immigration requirements, Canadian citizens and permanent residents will be considered first for this position.

Applications, including curriculum vitae and three letters of reference, should be received **before May 15, 2000** by:

**I. Hambleton, Chair
Mathematics & Statistics
McMaster University
Hamilton, Ontario
Canada, L8S 4K1**

CALENDAR OF EVENTS / CALENDRIER DES ÉVÉNEMENTS

MAY 2000

5–7 Unified Congress of Mathematical Associations and Groups of Quebec (Université Laval), a WMY2000 event
pallascio.richard@uqam.ca

26–27 Western Canada Linear Algebra Meeting (University of Manitoba, Winnipeg.)
www.math.uregina.ca/~tsat/wclam/wclam00.html

JUNE 2000

Canadian Mathematics Education Study Group Meeting (UQAM, Montreal) *Dates to be announced*

4–7 Annual Meeting of the Statistical Society of Canada (Ottawa, Ontario) *André Dabrowski: adrsg@uottawa.ca*

4–8 Canadian Annual Operator Algebra Symposium (Fields Institute, Toronto, Ontario) *elliott@math.utoronto.ca; www.fields.utoronto.ca/COS2000.html*

7–9 Symposium on the Legacy of John Charles Fields (The Royal Ontario Museum, Toronto); a WMY2000 event
www.fields.utoronto.ca/jc-fields-legacy.html

10–13 MATH 2000 (McMaster University, Hamilton, Ontario – includes the CMS Summer Meeting)

Participating Societies include the Canadian Mathematical Society (CMS), the Canadian Applied and Industrial Mathematics Society (CAIMS), the Canadian Operational Research Society (CORS), the Canadian Symposium on Fluid Dynamics (CSFD), the Canadian Society for the History and Philosophy of Mathematics (CSHPM) and the Canadian Undergraduates Mathematics Conference (CUMC). A WMY2000 event
www.cms.math.ca/Events/math2000

11–18 38th International Symposium on Functional Equations (Noszvaj, Hungary) *pales@riesz.math.klte.hu*

12–15 Integral Methods in Science and Engineering (Banff, Alberta) *Peter.Schiavone@ualberta.ca*

JULY 2000

10–14 Third European Congress of Mathematics (Barcelona) *3ecm@iec.es; http://www.iec.es/3ecm/info.htm*

13–25 41st International Mathematical Olympiad (Korea)

17–22 XIII International Congress on Mathematical Physics (Imperial College, London) *http://icmp2000.ma.ic.ac.uk*

30-Aug 5 7th International Conference on Radicals - ICOR 2000 (Innsbruck) *Rainer Mlitz: mlitz@umbriel.tuwien.ac.at*

MAI 2000

31–Aug 7 International Congress on the Teaching of Mathematics (ICME-9)(Tokyo/Makuhara)
http://www.ma.kagu.sut.ac.jp/icme9/

AUGUST 2000

7–12 AMS Meeting (Los Angeles); a WMY2000 event
www.ams.org/meetings/

21–24 International Conference on Geometry, Analysis, and Applications (in honour of late Professor V. K. Patodi). (Banaras Hindu University, Varanasi, India)
rspathak@banaras.ernet.in

SEPTEMBER 2000

22–24 American Mathematical Society Central Section Meetings (University of Toronto)
http://www.ams.org/meetings/

OCTOBER 2000

20–22 One Hundred Years of L'Enseignement Mathématique Symposium (Geneva)
http://elib.zib.de/IMU/ICMI/; EnsMath@math.unige.ch

NOVEMBER 2000

18–22 International Conference on “Mathematics for Living” (Jordan)
http://www.vsg.edu.au/egypt99/

DECEMBER 2000

10–12 CMS Winter Meeting / Réunion d'hiver de la SMC (University of British Columbia, Vancouver, B. C.)
Monique Bouchard: meetings@cms.math.ca

JUNE 2001

2–4 CMS Summer Meeting / Réunion d'été de la SMC (University of Saskatchewan, Saskatoon, Saskatchewan)
Monique Bouchard: meetings@cms.math.ca

Canadian Mathematics Education Study Group Meeting (University of Alberta, Edmonton)

Annual Meeting of the Statistical Society of Canada (Vancouver, British Columbia)

DECEMBER 2001

CMS Winter Meeting / Réunion d'hiver de la SMC (York University, Toronto, Ontario)
Monique Bouchard: meetings@cms.math.ca

AOÛT 2000

SEPTEMBRE 2000

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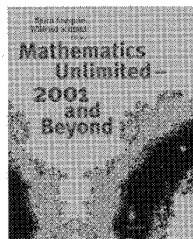
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