CMS NOTES de la SMC

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DU BUREAU DE LA PRÉSIDENTE

Dr. Christiane Rousseau

English version Page 26

Mon rapport annuel décrit nos nombreuses activités de l'année 2002 et les perspectives de 2003. Dans ce court texte je rajoute quelques nouvelles de dernière minute.

Le Forum canadien sur l'enseignement des mathématiques se tiendra à l'UQAM les 16-18 mai prochain. Le Forum comprendra 5 grands thèmes. Le premier thème sur la comparaison des expériences comprendra une conférence plénière de Liping Ma comparant les modèles chinois et américains et un panel présentant la situation dans les différentes régions du pays. Le second thème portera sur la pensée critique et la conférence plénière sera donnée par Jean-Pierre Kahane, qui a présidé la "Commission Kahane" mandatée par le ministre français de l'éducation pour faire des recommandations sur la révision des programmes de mathématiques dans les écoles françaises (niveau primaire et secondaire). Le troisième portera sur « Les mathématiques dans l'école moderne: buts et défis ». L'activité plénière consistera en un panel. Le quatrième thème portera sur la formation initiale et continue des enseignants. Les conférenciers pléniers seront le duo Hyman Bass et Deborah Ball, respectivement mathématicien et didacticienne, et chefs de file dans ce domaine aux États-Unis. Les 200 participants du Forum seront divisés en groupes de travail de 10 à 20 personnes qui se réuniront à trois reprises, soit après chacune des activités plénières des thèmes 2, 3 et 4. Les groupes de travail couvriront de nombreux aspects de l'enseignement mathématique allant des mathématiques pour le citoyen aux besoins de l'industrie. Un groupe de travail se penchera plus spécialement sur la problématique de l'enseignement des mathématiques aux communautés aborigènes et sur l'importance de la composante culturelle dans l'approche pédagogique: ce groupe de travail sera sous la responsabilité de Corinne Jetté, fondatrice et directrice du Concordia Native Access Engineering Program, Dawn Wiseman, coordonatrice de ce même programme, Ed Doolittle, directeur du département de mathématiques du Saskatchewan Indian Federated College, Jim Barta du State University of Utah, spécialiste de l'enseignement auprès des aborigènes américains et Louise Poirier de l'Université de

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CMS NOTES
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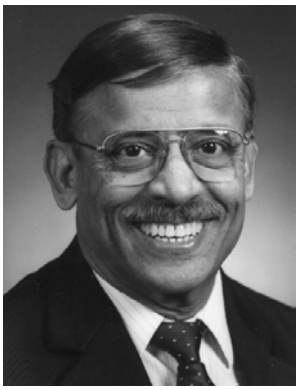
EDITORIAL



S. Swaminathan

Howard Eves [*Mathematical Circles Revisited*] tells the story of an introductory class in which he was teaching the principle of mathematical induction to a freshman class at the University of Puget Sound. He asked them to imagine themselves outside a room containing a bookshelf with a row of books. This row of books is known to have the property that if any book is red, so is the book after it. Peeking through a crack, the student observes that the eighth book is red; what conclusion — Eves asked the class — can be drawn? Then, Verner Hoggatt, Jr, who was a student in the class — and later became a mathematician with expertise on Fibonacci and allied sequences — asked, "Are they all good books?" "Alright," Eves said, "let us assume they are all good books." "Then," Verner replied, "all the books on the shelf are red." A bit shocked, Eves asked, "Why is that?" "Because, you see, all good books are read," Verner explained.

Thinking about good books in mathematics we may ask "What are the essential conditions of permanence of mathematics books?" In this age, due to ease of preparation of manuscripts using TEX, preprints, email and web postings, books and research papers spring forth from the fertile minds of mathematicians like the multitude of seeds from a single plant or the countless leaves upon trees in springtime, and their life is almost as short. Neither popularity nor an author's reputation indicates necessarily the fitness of a book or research work to survive the test of time. However, pioneering books, from Euclid's *Elements* to André Weil's *Foundations of Algebraic Geometry*, enjoy naturally a place of permanence. The law of the survival of the fittest may be applied. But what is "fitness" for the survival of books? Among the many criteria one may suggest, the most important one is originality. Yet, not all books with original content make the grade.

Introductory textbooks are, in many cases, deliberately reissued in a new edition every few years to defeat the used book market. Even advanced textbooks, not subject to this planned obsolence, are subject to double jeopardy; either their mathematical content or pedagogical style may become outdated. As such they usually have little or no permanency.

Of course, there are classics like Birkhoff-MacLane's, *Survey of Modern Algebra*, which is popular in spite of the modernized MacLane-Birkhoff's *Algebra*. G. C. Rota mentions Schaum's Outlines [in *Indiscrete Thoughts*] that have survived in print for half a century. Paul Halmos has described in his autobiography [*I Want to be a Mathematician*] how Dover Publications began, during the scarcity periods of World War II, reprinting classic mathematical books. Thanks to them we have reprints of works like G. H. Hardy's *Ramanujan*.

We invite readers to share their thoughts by writing to us.

AN IDEAL TEXT FOR A FIRST GRADUATE COURSE

Book review by Donald Dawson, Carleton and McGill Universities

Lectures on Monte Carlo Methods
Neal Madras
Fields Institute Monographs, 16
American Mathematical Society, 2002 viii + 103 pp

Monte Carlo simulation refers to computer simulations involving random elements simulated using random number generators. Monte Carlo computer simulations were first developed by Stanislaw Ulam and John von Neumann in the Manhattan Project during the second world war to carry out complex calculations on neutron diffusion. The uses of Monte Carlo steadily increased as the scientific community had access to faster computers. Today Monte Carlo simulation is a major tool throughout the sciences as even a casual review of the literature will reveal. Its power is due to the fact that it is applicable for complex problems that are otherwise intractable. Monte Carlo methods are used not only as a tool to simulate systems such as radioactive decay that are intrinsically random but also as a tool to solve complex purely deterministic questions such as integration in high dimensions. In these cases the simulation does not produce an exact answer but in fact is a statistical estimate with error. A great advantage of Monte Carlo is the simplicity of implementing it on a computer. However using these methods without understanding the subtleties involved can lead to misleading results. In response to this need, a rigorous study of Monte Carlo methods was initiated in the late 1940's (see for example [2]) and has developed into a mature science. This set of lectures by Neal Madras, originally given as part of the 1998-99 Fields Institute thematic program on Probability and its Applications, provides an excellent introduction to basic ideas and methods in this subject.

The main body of the book is structured into a short introduction and six main chapters that cover the essentials of the subject.

Chapter 2. Generating Random Numbers Monte Carlo
Monte Carlo can be viewed as a collection of methods to obtain numerical or graphical results starting with a sequence of independent random variables uniformly distributed on the interval [0,1]. For computer implementation a fast algorithm that can produce large numbers of such random variables is required. The first subtlety is that no such algorithm exists and implementation must be based on "pseudo random number generators". In spite of this, most applications of Monte Carlo depend on statistical behavior governed by the law of large numbers and central limit theorem that is also exhibited by these sequences. This chapter introduces different random number generators and empirical statistical tests to determine if certain statistical properties of the generated sequences differ significantly from a typical true random sequence. It turns out that there are good and bad random number generators and early computer implementations included some notoriously bad ones. The remaining part of the chapter is devoted to the more practical problem of generating random variables with different distributions starting from the basic sequence of i.i.d. uniform random variables.

Chapter 3. Variance reduction techniques
The second subtlety is that the result produced by Monte Carlo, for example, the calculation of an integral, is a statistical estimate and some measure of the error is needed. Most of the estimators involved are unbiased, that is, the expected value gives the exact answer, so that the variance provides a measure of the error. Much of the early development of Monte Carlo was devoted to methods to reduce the variance. This chapter gives an excellent survey of the clever ideas that have proven to be useful — these include stratified sampling, importance sampling, and the use of common random numbers, control variates, and antithetic variates. For example, the method of "antithetic variates" is based on the simple fact that the sum of negatively correlated random variables has a smaller variance than that for independent random variables. The different methods are demonstrated for some interesting network reliability and queueing system problems which are typical of the more complex tasks that Monte Carlo is routinely used for.

Chapter 4. Markov chain Monte Carlo
Since around the mid 1980's a host of new applications of Monte Carlo has developed based on Markov chain Monte Carlo (MCMC). Many problems arising in applications lead to "complex" probability distributions that are difficult to simulate directly. MCMC is based on the observation that in many cases one can find a Markov chain whose stationary distribution coincides with the desired distribution. Then to obtain a sample from such a distribution one simply simulates the Markov chain until it is close to stationarity. Of course, this raises the important question as to how fast the Markov chain reaches equilibrium and this has given rise to a very active research area. This chapter introduces different ways of designing such a Markov chain including the Metropolis algorithm and the Gibbs sampler that is an

offshoot of ideas from statistical physics. Madras gives a short but enlightening introduction to the subject and its application to Bayesian statistics and optimization. The application of these ideas to the famous "knapsack" problem is discussed and this is used to introduce the method of "simulated annealing" — a Monte Carlo method to find the global minimum of a complicated function on a high dimensional space. The idea behind this is an analogue of cooling a physical system sufficiently slowly so that it is always in thermal equilibrium. This method has had some success in image processing, VLSI design, and vehicle routing. Readers interested in the current state of MCMC can also consult the proceedings of a research workshop held during the Fields Institute program [1]. One focus of that workshop is the idea of "perfect sampling" using coupling from the past — when applicable this method produces samples from the exact distribution and not an approximate stationary distribution.

Chapter 5. Statistical Analysis of Simulation Output
This chapter introduces some of the standard statistical issues that arise in simulation including methods of estimating variances and covariances and basics on confidence intervals.

Chapter 6. The Ising Model and Related Examples
This chapter describes some more advanced applications of Monte Carlo to the Ising model of statistical physics, and image analysis.

To conclude, this is an ideal text for a first graduate course on Monte Carlo methods for statisticians, mathematicians, computer scientists, and other scientists. The author is a leading expert in the field and he has made a careful choice of material to give readers a good basic introduction to the field.

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[2] S. Ulam and N. Metropolis. "The Monte Carlo method," Journal of American Statistical Association, 44, 335, 1949.

DU BUREAU DE LA PRÉSIDENTE (suite)

Montréal qui visite souvent les Innus du Nunavik. La conférence publique sera donnée par Jean-Marie de Koninck. Le cinquième thème portera sur l'élaboration d'une vision du futur et consistera en deux panels. Le premier, présidé par Katherine Heinrich portera sur les actions à entreprendre: collaborations accrues entre les différents niveaux d'enseignement, collaborations accrues entre les provinces, problématique de la création d'une sous-commission canadienne de la CIEM (Commission internationale de l'enseignement mathématique). Le second panel aura pour thème Comment amener les conclusions du Forum au public?" Il accueillera entre autres Isabelle Blain, vice-présidente au CRSNG, Heather Sokoloff du National Post, et Ivar Ekeland de UBC. Le programme complet du Forum se trouve au *www.smc.math.ca/Reunions/FCEM2003*.

Le 28 février 2003 la communauté mathématique canadienne s'est réunie à Banff pour inaugurer BIRS, la station de recherche internationale de Banff. Cette station a été fondée à l'initiative du *Pacific Institute for Mathematical Sciences* (PIMS) et du MSRI (*Mathematical Sciences Research Insitute*) de Berkeley, grâce à la vision et au leadership de Nassif Ghoussoub, directeur de PIMS et David Eisenbud, directeur du MSRI. La station de Banff sera le pendant nord-américain des centres de rencontres mathématiques d'Oberwolfach en Allemagne et de Luminy en France. Elle est subventionnée par le CRSNG au Canada, la NSF aux États-Unis, la province de l'Alberta via ASRA (*Alberta Science Research Authority*), le PIMS et MITACS. La station commencera à accueillir des rencontres mathématiques dès le 15 mars 2003 et sera active pendant 40 semaines par an. Robert Moody en est le directeur scientifique et Nassif Ghoussoub le directeur exécutif. Le camp d'entraînement de l'équipe canadienne pour l'olympiade internationale se tiendra à BIRS en juillet prochain.

La prochaine réunion se tiendra à Edmonton au mois de juin et comprend 13 sessions spéciales. Il est encore temps de vous inscrire ou d'y envoyer vos étudiants.

The most up-to-date information concerning all CMS Prize Lectureships & Awards programmes, including complete lists of recipients, can be found at: *http://www.cms.math.ca/Prizes/*

Vous trouverez l'information la plus récente sur les prix et bourses de la SMC, y compris les listes de lauréats, sur le site Web suivant: *http://www.cms.math.ca/Prix/*

EDUCATION NOTES

Ed Barbeau and Harry White

Daniel Britten Honoured

Dr. Daniel Britten

In recognition of his outstanding teaching abilities, passion and dedication, Dr. Daniel Britten, Department of Mathematics was honoured at the June 2001 convocation ceremonies as a recipient of the University of Windsor Alumni Award for Distinguished Contributions to University Teaching. Students, former students, and colleagues agree that his commitment to quality instruction is unparalleled. To quote a former student "Dr. Britten has a way of connecting with his students, and his creative teaching methods make his courses fun and understandable. He willingly provides extra assistance to those who need it, and assists students with learning about career opportunities. Dr. Britten is one of the best teachers I ever had. His enthusiasm is infectious and his encouragement to students unending.". Past winners of the award from the Mathematics and Statistics Department include Frank Lemire (1993), Om Chandna (1996), Cormac Smith (1987). Om Chandna also won an OCUFA Award in 1973. The award winning teaching in this Department is a testament to the founding Head, Father Faught.

R. Caron, University of Windsor

What is core mathematics?

Mathematics is the ideal base from which to develop interdisciplinary activities because mathematics includes the art of reasoning, the science of measurement, and the language of science. This definition is a gentle reminder that mathematics is not tethered to a specific set of courses or subjects, but that rather mathematics is a process. This process seems pleasant; however, a classroom journey to a lifetime of learning and discovery is extremely arduous. If the role of mathematics education is not well defined, this journey will be even more dicult. Mathematics reform is about redefining the role of mathematics in education. Mathematics must be focused more on the process of reasoning than on the foundations of knowledge and information. (Gary Krahn, United States Military Academy).

This quotation picks up several of the main threads in the discussions that appear in a recent publication in the Notes series of the Mathematical Association of America on issues in mathematical education and pedagogy. The volume in question is:

Changing Core Mathematics
Chris Arney and Donald Small, editors,
xi + 181 pp., paperbound, 2002 ISBN 0-88385-172-5
List Price: US$28.95 Catalog Code: NTE-61

It reflects the soulsearching that is going on among mathematicians and those in ancillary disciplines as to the appropriate goals and curricula for the core mathematics of the first two tertiary years in the face of several realizations. Courses cannot be merely content-based. We have not in the past been all that successful in having our students retain, and be able to use effectively, what they have been taught. The rise of technology has necessarily changed how we have to think about and respond to issues, and presented both opportunities and dangers that need to be addressed. As the editors and several other contributors are from the United States Military Academy, it appears as though this institution is in the van of new developments.

To spur a wider debate, it organized a workshop that brought together a dozen engineers, four physicists and over two dozen mathematicians from a variety of organizations and led to this publication.

The first of the two main parts of this book provides an historical presentation of course development and pedagogical change, sets out the framework in which further changes will occur, and calls for more emphasis on process and less on content. Of particular interest are two chapters entitled "Inquiry and modeling" and "Framework for a two-semester integrated program"; the former provides suggestions for actively engaging students in problems and making of judgments, and the latter contains a block outline for a two-semester 100-lesson integrated core-program based "on a change theme – discrete and continuous". The second part consists of 21 short essays by the participants that cover the territory from the perspectives of interdisciplinary culture, technology, goals and content, and instructional techniques. How do we get colleagues from different backgrounds collaborating? How do we set goals, expectations and standards? What should students be able to learn on their own and how should class time be used? How will textbooks and technology be used in the future? How do we promote contextual learning? What are the pitfalls in the new environment? These are but few of the questions addressed, and some specific recommendations are made by some of the essayists, in particular on what the first two years of a mathematics program might consist of, especially for scientists and engineers. Some of the essays as well as three appendices contain mathematical examples.

Not addressed is the extent to which institutional cultures might support the sort of development espoused by the essayists. It is clear from some of the comments that a considerable amount of time and resources from individuals and from institutions is required; this suggests that the changes envisaged can only happen where there is a radical institutional commitment to teaching that goes beyond advice on lecturing and course evaluations. An infrastructure and recognition through promotion and salary increments are needed along with a sense among university faculty that their contributions in pedagogy are valued equally with their achievements in research.

An area question

Some years ago, there was an interesting question on the South African national high school competition. It was accompanied by a diagram, which you can reproduce in its essentials as follows. In the cartesian plane, mark the points $A(0, 0)$, $B(2, 0)$, $C(3, 0)$, $D(3, 2)$, $E(3, 3)$, $F(0, 3)$, $G(2, 1)$, $H(1, 1)$, $J(1, 2)$. Join pairs of these to create a rectangle partitioned into an octagon $ABGHJDEF$ and a hexagon $BCDJHG$. The contestants were told that the diagram is not drawn to scale, and that the lengths of the sides of the octagon were 1, 2, 3, 4, 5, 6, 7, 8 in some order. The problem was to select the lengths of the sides of the octagon in order that the area of the hexagon be maximized. There seem to be several aspects of this problem that are useful for mathematics teaching, including (1) the need for abstraction of the apparent dimensions of the figure from its essential characteristics, (2) imagination to envisage possibilities, (3) reasoning to hone in on the viable cases, (4) organization and thoroughness in canvassing all cases, along with (5) a modicum of arithmetic and geometry. I have tried this problem on teachers-to-be at the university, but I suggest that this problem has its natural home in the Grade 6-8 range.

In the diagram as actually drawn, AF was longer than FE, so that some 3 students did not entertain the possibility that FE might actually be the longest side. One can avoid irrelevancies by noting certain constraints, such as $|AF| = |ED| + |JH| + |GB|$ $1 + 2 + 3 = 6$. Keeping our eyes on the maximization of the hexagon's area, one should infer that, whatever the choices of the lengths of ED, GB and JH, we ought to have that $|ED| < |GB| < |JH|$, so that the possibilities for these lengths are $\{1, 2, 3\}$, $\{1, 2, 4\}$, $\{1, 2, 5\}$ and $\{1, 3, 4\}$. Add to this the question of finding the best way of calculating the area of the hexagon and we have a nice multi-faceted but accessible problem for individual or group work.

THROUGH THE LOOKING GLASS

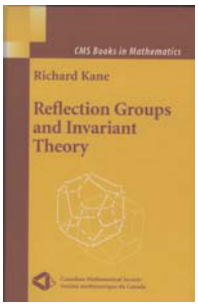
Book review by H.E.A. Campbell, Queen's University

Reflection Groups and Invariant Theory

Richard Kane

CMS Books in Mathematics

Springer Verlag, 2003 pp. 368



Now, here, you see, it takes all the running you can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!

Lewis Carroll, Through the Looking Glass

In 1986, when I first started to think about the invariant theory of finite groups, there existed only one superb reference, the article by R.P. Stanley[1]. Since that time, there has been an explosion of interest, with many books and articles published, and conferences held. For example, there are two books by Bernd Sturmfels[2],[3], David Benson's book[4] *Polynomial Invariants of Finite Groups*, and Larry Smith's book[5] by the same title, as well as more recent books by Harm Derksen and Gregor Kemper[6] *Constructive Invariant Theory* and a book by Mara D Neusel and Larry Smith[7] *Invariant Theory of Finite Groups*. The book under review is most similar to the book by Humphrey[8], which covers some of the same material but is aimed at applications to Lie Algebras.

These books address quite different situations than the book under review: more general sorts of groups, consequently exhibiting less structure, and with different foci. Mathematicians seem to be interested in either Coxeter and Weyl groups, focusing on root systems and their combinatorics, or in *pseudo-reflection* groups and invariant theory. The former group are interested in Lie algebras and algebraic groups while the latter group includes commutative algebraists and topologists. This is the first book I've read that is aimed at both audiences, providing a clear exposition of a truly beautiful area of mathematics. It is probably fair to say that there isn't much new in the book, except to find all the relevant material in the one place, well-organized and well-explained. And so we have the advantage over Alice!

Let us accept that manifolds, their tangent bundles and the associated structure groups G — which are often the classical Lie groups (such as U_n) — embody very important aspects of physical systems, and therefore their study and properties are central to mathematics. It's one of the great triumphs of the mathematics of the 20th century that such bundles are classified by (homotopy classes) of maps of the base manifold into the "classifying" space BG of the structure group itself.

Mathematicians have expended considerable energy and enjoyed considerable success in examining the various algebraic and topological aspects of these classifying spaces. Indeed, it is fair to say that much of modern homotopy theory and algebraic topology has roots in this topic.

One of the most beautiful theorems I've ever encountered is the theorem of Borel. Suppose G is a compact Lie group with maximal torus T of rank, let's say, n. Let $W_G(T)$ be the Weyl group of G, that is, the normalizer of the torus T in G modulo the centralizer of the torus T in G. For example, suppose G is U_n the unitary group over the complex numbers. Then the Weyl group of the maximal torus is the symmetric group on n letters. Now the rational cohomology of the classifying space of the torus is a polynomial algebra over the rationals, and moreover, the Weyl group $W_G(T)$ can be shown to act as degree-preserving automorphisms of this algebra. Borel's theorem calculates the rational cohomology of the classifying space BG as the ring of invariants of the Weyl group. In the classical notation, the theorem is that

$$H^*(BG;Q) \cong Q[x_1, \ldots, x_n]^{W_G(T)}$$

For example, then

$$\mathrm{H}^*(BU_n;Q) \cong = Q[x_1, \ldots, x_n]^{\Sigma_n} = Q[e_1, \ldots, e_n],$$

where e_i is the i-th elementary symmetric function in the x's.

The latter result, that functions invariant under all permutations of their variables can be written as polynomials in the elementary symmetric functions dates back to the time of Newton and Vandermonde. In part, the motivation at that time was to understand which univariate polynomials could be factored in terms of roots, the famous problem which led to Galois theory. If a univariate polynomial $p(t)$ of degree n does have n roots, say $x_1, \ldots, x_n$, we may write

$$p(t) = (t-x_1)(t-x_2) \cdots (t-x_n).$$

When we expand this product we obtain the elementary symmetric functions (up to sign) as the coefficients of the powers of t, and we observe that these are invariant under all permutations. This leads us to consider abstractly which polynomials in the x's are invariant under all permutations of the variables, and the classical result cited above.

What is most interesting about this result in the context of Kane's book is that the ring of invariants is again a polynomial algebra. Parts one and two of Kane's book could be summarized as the answer to the question: when does a finite group acting on a polynomial algebra have a polynomial algebra as its ring of invariants?

A *reflection* in Euclidean space is a linear map of the space which fixes (pointwise) a hyperplane and sends vectors orthogonal to the hyperplane to their negatives. And a *reflection group* is any group of transformations generated by such reflections. A modest generalization is a *pseudo-reflection* which is a linear map of finite order that fixes (pointwise) a hyperplane. In characteristic 0, where we have available an inner product, the condition of finite order implies that the vectors orthogonal to the hyperplane are mapped to a root of unity times themselves by a *pseudo-reflection*. However, in positive characteristic, a *pseudo-reflection* need not be diagonalizable.

Reflection groups and their generalizations *pseudo-reflection* groups have a lot of structure. In particular, the rich geometric and algebraic structure of the group is reflected by the rich algebraic structure of the associated ring of invariants.

The book has three parts in which these ideas are explored.

In the first part, reflection groups are studied in detail. For example, they may be classified by means of root systems, which provide the necessary combinatorial and algebraic data. Essentially, the geometric configuration of the reflecting hyperplanes (those associated to a set of generating reflections of the group) can be summarized in the concept of a root system, which leads naturally to the graphs and diagrams of Coxeter and Dynkin. This leads to other interesting associated ideas, such as the length of an element in a reflection group, which is, roughly speaking, the minimal number of reflections required to describe the element. Notably, the book provides a clear and understandable proof of an old theorem of Borel and de Siebenthal[9] describing maximal closed sub-root systems (page 136).

In the second part of the book, the invariant theory of these sorts of groups is studied. There is a thorough treatment of the beautiful result that in characteristic 0 a ring of invariants is a polynomial algebra if and only if the group is generated by *pseudo-reflections*. There is also a discussion of the result that, in arbitrary characteristic, if a group has a polynomial ring of invariants then the group must be generated by *pseudo-reflections*. This latter discussion is nearly self-contained, except for appeal to the Purity of Branch Loci theorem and Nakayama's lemma. These theorems have enormous appeal, linking the geometry of the representation of the group to the algebraic properties of the invariant ring.

This material also leads to work yet to be done. A modular group is a group whose order is divisible by the characteristic of the field. And, for example, there is as yet no characterization of modular groups with polynomial rings of invariants.

This part of the book goes on to present a number of fascinating auxiliary concepts: skew-invariants, extended rings of invariants, and more. One of the most interesting sections deals with harmonic polynomials and their relation to the ring of covariants. This latter ring is obtained as the quotient of the ring of all polynomials by the ideal generated by the positive degree invariants. Many of the arguments here are due to Steinberg, and there is a lovely characterization of reflection groups in terms of harmonic polynomials.

The third part of the book extends the first two parts, exploiting the interplay between the geometry and combinatorics of the groups and the algebraic structure of the invariant rings. Information is obtained about the conjugacy classes in reflection groups, regular elements are defined, their eigenvalues analyzed, and the natural description of the invariant ring as the coordinate ring of the orbit space associated to the group introduced. Further, a start is made on exploiting this relationship to understand conjugacy classes in *pseudo-reflection* groups. I believe this to be the first time this material has been gathered in one place. Moreover, there is still work to be done here too.

This is a very lovely book to read. I found the pace of the book to be perfect. The approach follows the development of the subject in the literature closely - this is how it was discovered, more or less. It appears to my eye to be accessible to a first-year graduate student. It is not overly terse, nor overly wordy and there are many examples.

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REPORT FROM THE VICE-PRESIDENT

James Mingo – Queen's University

James Mingo

"The idealism of the undergraduate student, his eagerness to achieve something for his college, for his country or for any cause which fills him with enthusiasm is constantly referred to with admiration by those in charge of universities. This unselfish impulse is recognized as one of the strongest forces in a student's life, and great results have been and are being accomplished by appealing to it."

Thus began an article written by William Lowell Putnam in 1921 which proposed an intellectual competition between universities at the team level. Putnam clearly imagined this competition along the lines of a Harvard-Yale football game, which Harvard would win. After two experimental competitions in 1928 and 1933, the Putnam competition as we know it began in 1938.

"Young Einsteins" John Coleman, Nathan Mendelsohn, and Irving Kaplansky
Picture reprinted from the Toronto Star (January 1939)

Thus, sixty-five years ago on April 18, the first competition took place with the winning team consisting of John Coleman, Irving Kaplansky, and Nathan Mendelsohn, then students at the University of Toronto. Toronto went on to win another three times. The only other Canadian universities to win have been Queen's in 1952 and Waterloo in 1974 and 1999. Although it took Harvard seven attempts to achieve its first victory, W. L. Putnam would now be smiling as Harvard has won thirteen of the last twenty competitions.

Some of the questions on the first examination will be quite familiar to calculus instructors. For example, question 5 of of the morning session asked for the limit of n^2/e^n as n tends to infinity; while question 6 read:

A swimmer stands at one corner of a square swimming pool and wishes to reach the diagonally opposite corner. If w is his walking speed and s is his swimming speed (s < w), find the path for shortest time.

[Consider two cases: (i) $w/s < \sqrt{2}$, and (ii) $w/s > \sqrt{2}$.]

To date, of course, the questions are more difficult and the median score this year, in a field of over three thousand contestants, was 3.

In 1938 John Coleman and Nathan Mendelsohn were in their third year as undergraduates and Irving Kaplansky was in his fourth. Kaplansky was the first Putnam scholar, a scholarship awarded to an individual scoring in the top five. The rules of the day forbade Coleman, Kaplansky and Mendelsohn, as members of the winning team, from writing the following year. It might be noted that all three later became successful administrators as well as successful mathematicians.

John Coleman attributed Toronto's early success to two aspects of the Ontario educational system of the day. The first was the high level of scientific training of the provincial high school teachers, perhaps because this was one of the few professions at the time where someone could follow a passion for mathematics. The other was the Mathematics, Physics, and Chemistry (MPC) program at the University of Toronto. This challenging program attracted strong students who sought a rigorous training in science.

Irving Kaplansky recalled that Samuel Beatty, the Department Head, took the competition quite seriously and organized coaching sessions. Moreover the MPC program drilled students in classical mathematics along the lines of the Cambridge Tripos and this gave Toronto students more experience than other programs at the time.

Irving also recalled that the win made quite a splash in the local press, producing a two page story in one paper. Canon Cody, the President of the University of Toronto, personally congratulated the winners remarking that this vindicated the university's policy of not discriminating against Jewish students. Irving recollects telling William Cody, the fourth Toronto competitor, after the first paper that it was too easy.

Nathan Mendelsohn remembers the excitement he felt at being named a member of the Putnam team: "In 1938 or late 1937, Prof. Beatty announced that a contest in mathematics was to be held in which each university in North America could name a team of three contestants. In

that year only members of a designated team would be allowed to participate. The contest was named the William Lowell Putnam competition. When I found out that I was named a member of the team, it aroused in me a great deal of excitement. It also produced much puzzlement since there was no previous contest on which I was to base my preparation. I opted finally to work at solving Professor Beatty's 100 problems. These were problems which were handed out in his classes for his students to solve. Subsequently they appeared in the proceedings of the First Canadian Mathematical Congress in 1946. As an example of their difficulty, the following is one of the problems given to the first year honours class".

Given n positive numbers $a_1, a_2, \ldots, a_n$ *show that the sum* $\sum 1/(a_1(a_1 + a_2)(a_1 + a_2 + a_3)\cdots(a_1 + a_2 + a_3 + \cdots + a_n))$, *taken over all permutations of* $a_1, a_2, \ldots, a_n$, *is* $1/(a_1 a_2 \ldots a_n)$.

The Society has invited Coleman, Mendelsohn, and Kaplansky to a reunion and celebration at the meeting in Edmonton in June.

John Coleman was born in Toronto in 1918. he obtained his B.A. from Toronto in 1939 and spent the next year at Princeton on a fellowship from the University of Toronto. He obtained his Ph.D. from the University of Toronto in 1943. His first academic appointment was at Queen's University from 1943 to 1945. From 1945 to 1949 he worked at the World's Student Christian Federation in Geneva and in 1949 he took up a position at the University of Toronto. In 1960 he became the Department of Head at Queen's University. He was president of the CMS from 1973 to 1975.

Nathan Mendelsohn was born in Brooklyn N.Y. in 1917. He earned all his degrees at the University of Toronto (B.A. in 1939 and Ph.D. in 1943). He began his academic career at Queen's University in 1945 and in 1947 he moved to the University of Manitoba. In 1981 he became the university's first `Distinguished Professor'. He was president of the CMS from 1969 to 1971.

Irving Kaplansky was born in Toronto in 1917. After completing his B.A. and M.A. from Toronto he earned his Ph.D. at Harvard in 1942. From 1945 to 1984 we has at the University of Chicago. In 1984 he became the second director of MSRI in Berkeley.

NEWS FROM DEPARTMENTS

York University, North York, ON

Appointments
Younes Benslimane (Assistant Professor, July 2001, ITEC); Luiz Cysneiros (Assistant Professor, July 2002, ITEC); Ilijas Farah (Assistant Professor, July 2002, Set theory); Jackie Ho (Assistant Professor, July 2002, Operations research); Steven Wang (Assistant Professor, July 2002, Statistics); Zijian Yang (Assistant Professor, July 2002, ITEC); Michael Zabrocki (Assistant Professor, July 2002, Algebraic Combinatorics); Huaiping Zhu (Assistant Professor, July 2002, Dynamical systems);Byron Wall (Associate Lecturer, July 2002, History of Science); Hans Joshi (Sessional assistant professor, July 2002); Eli Brettler (Sessional assistant professor, July 2000).

Promotions
Yuehua Wu, Buks van Rensburg (Professor, January 2001); Nantel Bergeron (Professor, January 2002); Yun Gao, (Associate Professor, July 2002); Huaxiong Huang (Associate Professor, July 2002);Peter Song (Associate Professor, July 2002).

Retirements
Israel Kleiner (July 2002); Pat Rogers (early retirement on becoming Dean of Education at Windsor, July 2001).

Resignations
Masoud Asgharian (July 2001);:Alan Dow (July 2001); Lisheng Hou (July 2001); Scott MacKenzie (July 2001); Francine Vinette (September 2002); Donna Salopek (January 2003).

Awards
Neal Madras (FRSC); Nantel Bergeron (Tier 2 CRC, July 2001); Jianhong Wu (Tier 1 CRC, July 2001).

Dalhousie University, Halifax, N.S.

Appointment
Keith Taylor
(Professor and Dean of Science, July 2003, Harmonic Analysis).

McMaster University, Hamilton, ON

Appointments
June Zhu (Assistant Professor, July 2002, Number Theory); Stefan Mueller-Stach (Professor, January 2003, Algebraic K-theory, Motivic Cohomology); Patrick Speissegger (Associate Professor, June 2003, Model Theory).

Deaths
Gunter Bruns, Professor Emeritus, died December 23 2002; Ernst Gadamer, Retired Professor, died January 3, 2003.

Award
Patrick Speissegger (Tier II Canada Research Chair,
June 2003, Model Theory)

University of Western Ontario, London, ON

Promotions
Jan Minac (Professor, July 2003);
David Riley (Professor, July 2003).

Award
J. F. Jardine (Tier I Canada Research Chair, October 2002, Applied Homotopy Theory).

CANADA RESEARCH CHAIRS IN THE MATHEMATICAL SCIENCES

Reprinted from www.chairs.gc.ca

As was mentioned in the last issue, the Notes is publishing research profiles of recently-created Canada Research Chairs in the mathematicsl sciences. We continue this month with five more chairs created last fall.

Rachel Kuske
Canada Research Chair in Applied Mathematics
The University of British Columbia
Tier 2 – October 1, 2002

Incorporating applied mathematics to analyze industrial problems offers huge potential benefits to society, but until recently, this was a relatively underdeveloped area of research. New industrial developments, such as the discovery of fuel cells, are now creating exciting opportunities for mathematicians to become more involved in real-world industrial problems. Dr. Rachel A. Kuske is taking full advantage of these opportunities.

Dr. Kuske is committed to advancing research in this important field. She has already established an international reputation as an expert in the field of applied mathematics and a pioneer in the areas of asymptotic analysis and stochastic differential equations. Few other researchers can boast her track record for leadership and innovation.

As Chair in Applied Research, Dr. Kuske is spearheading the creation of a strategic resource centre where she and other applied mathematicians can collaborate with many diverse Canadian industries to develop effective mathematical models to aid in analyzing and successfully solving a number of challenging industrial problems. The Mathematical Research Centre in Industry and Applications will house high performance computing facilities in a central location. It will support a broad base of innovative research talent. These researchers will work on a variety of integrated mathematical applications covering areas such as mathematical finance, biological modelling, dynamics of structures, optics and geophysical processes.

The focus of Dr. Kuske's own research is to develop new mathematical methods to study complex physical phenomena, combining asymptotic analyses based on crucial scale factors with computer-intensive approaches. Her goal is to explore and gain insight into the effects of random fluctuations and variations of control factors of various applications which are sensitive to such changes, including optics, chemical reactions, cellular dynamics, structural failures, rock fractures, option pricing and neural response. Increasing understanding of any one of these systems will, in turn, provide answers to other seemingly unrelated applications, due to the similarities that are extracted from the mathematical analysis.

Ravi Ramakrishna
Canada Research Chair in Number Theory and Galois Representations
McGill University
Tier 2 – October 1, 2002

In 1630, a French lawyer and amateur mathematician, Pierre de Fermat, posed a question that became what many have referred to as the "Mount Everest" of mathematics. His assertion — that it was impossible to express a perfect integer cube, or any higher power, as a sum of two like powers — baffled countless mathematicians. For more than 350 years, Fermat's Last Theorem stood as the most famous unsolved problem in the field. In 1986, it became clear that another outstanding problem — known as the Shimura-Taniyama-Weil conjecture — was related to Fermat's Last Theorem, and work toward a solution of that conjecture helped provide the arithmetic ammunition British mathematician Andrew Wiles needed to propose a solution to both it and Fermat's enduring problem in 1993.

Of course, in mathematics, proposing a solution is only the first step in a lengthy, complex process. Others must verify the result, and extend the result to other outstanding problems.

Dr. Ravi Ramakrishna is a leading member of a new generation of number theorists who will expand Wiles' work into the 21st century and into new areas of pure and applied mathematics.

A student of Wiles' at Princeton University, Dr. Ramakrishna supplied an important technical ingredient in Wiles' resolution of the Shimura-Taniyama-Weil conjecture, which led to the solution of Fermat.

Dr. Ramakrishna's work in the area of Galois representations — which includes proving a consequence of Jean-Pierre Serre's important conjecture about modular forms — provides the basis for his future research.

In addition to significant gains in the field of number theory, it is expected that Dr. Ramakrishna's research will have important applications to the field of cryptography and the challenge of developing algorithms that are sufficiently complex to ensure a high degree of security for data transmission and storage.

Thomas J. Ransford
Canada Research Chair in Spectral Theory
Université Laval
Tier 1 – October 1, 2002

Because so many physical systems are essentially linear in nature, spectral theory — the branch of mathematics devoted to the study of matrices and their eigenvalues, as

well as their infinite-dimensional counterparts, operators and spectra — plays a key role in solving problems related to science and engineering.

In the past, progress in spectral theory has been driven by the needs of applied mathematics. Reflecting this reality, Dr. Thomas Ransford, one of the world's leading practitioners of spectral theory, has developed a research program that draws on the resources, and cross-pollinates the work of, researchers in physics, electrical engineering and pure and applied mathematics. His program will be conducted in collaboration with specialists from each of these areas to develop the techniques necessary to solve the mathematical problems that arise in providing efficient numerical algorithms or new ideas for design.

His work will fall into three broad areas. The first is stability and convergence in numerical simulation, which plays an important role in science and engineering. Dr. Ransford will address two main questions, one theoretical and the other of a practical nature. Second, he will work with colleagues in applied mathematics and researchers in *Université Laval*'s optics, photonics and laser labs to solve existing problems concerning the design of effective optical waveguides. His third area of concentration is control theory and interpolation, which arises in the design of automatic feedback mechanisms, such as autopilots for airplanes.

To solve problems in these three areas, Dr. Ransford must develop new techniques in both commutative and non-commutative spectral theory, and his work holds the potential of attracting leading young mathematicians to the university to attack these challenging questions.

Peter S. Swain
Canada Research Chair in Systems Biology
McGill University
Tier 2 – October 1, 2002

The ability of cells to perceive and process information is fundamental to life. But single molecules rarely possess the power to do this; more frequently, molecules act together in biochemical networks to fulfill their functions within complex organisms. While the completion of genome-mapping projects helps to clarify which genes work in concert, the intricacy and large number of components in most biological systems make it impossible to analyze their interactions without the use of computer modelling and theoretical experimentation. Even then, scientists face the challenge of understanding a model that is almost as complex as the biochemical network itself. Of more practical use is the extraction of a set of design principles that govern the architectures of biochemical systems. The key to this is the concept of modules, or subsystems of genes and proteins that interact to perform a unique biological function.

Dr. Peter Swain's goal is to find and describe small biochemical systems which occur frequently in nature, and form the building blocks from which larger gene networks are constructed. By modelling well-studied examples, Dr. Swain will quantitatively describe the base of functional modules from which more complicated systems are built. His research will be aimed at elucidating three fundamental characteristics of the networks that govern all cellular information systems.

First, they are reliable, despite low numbers of proteins, and particularly DNA binding sites, which can potentially lead to extreme susceptibility to stochastic fluctuations. Second, they are highly robust and can, for example, be almost immune to substantial concentration changes in their components. Finally, they are specific; regardless of the availability of a large number of structurally similar substrates, information is only passed to appropriate targets. Dr. Swain intends to develop ideal examples with which to study each of these properties in turn.

Jie Xiong
Canada Research Chair in Stochastic Processes and Filtering
University of Alberta
Tier 2 – October 1, 2002

Probability theory and the use of stochastic partial differential equations (SPDEs) have become increasingly important in analyzing a broad range of phenomena in natural sciences and economics. Many processes can be described by differential equations where some of the parameters and/or the initial data are unknown. To compensate for this lack of information, stochastic noise is introduced into the equations, either in the parameters or the initial data, resulting in stochastic differential equations.

Dr. Jie Xiong brings an extensive background in statistics and pure mathematics to his research project that focuses on stochastic analysis, particularly in the filtering of signals with random noises. His research will address the areas of non-linear filtering models for spatial signals, branching interacting particle systems and population models with interactions.

In the area of stochastic filtering models, Dr. Xiong will examine the topics of environmental pollution – with the aim of estimating the spread of chemical distribution – the tracking of submarines for oceanic observation, and the modelling and analysis of random fluctuations in signal theory and dynamic systems.

His research in the area of branching interacting particle systems will attempt to build a probability model to predict the evolution of populations and genetic distribution.

This is related to Dr. Xiong's work in his third focus area, where he will examine population models with one- and two-way interaction in an attempt to solve open problems regarding the interface between catalysts and reactants. The completion of this work is expected to have a fundamental impact on the interaction and evolution of species, and important consequences for the theory of non-linear SPDEs.

CMS ANNUAL REPORTS FROM COMMITTEES

Editorial Note: The following were edited from the 2002 Annual Reports from the President and the Society's Standing Committees. The Treasurer's Report will appear in the September issue of the Notes. Complete lists of Committee Members are available in the 2002 Annual Report as well as on our Web site at: http://www.cms.math.ca/aboutcms/

President's Annual Report

Christiane Rousseau

2002, A good year for CMS and Mathematics in Canada
The year 2002 was an exciting year for CMS and for mathematics in Canada, due to the quality of the discipline and the dedication of so many members of the Canadian mathematical community. As President, I again wish to remind you how hard and effectively our Executive Office continues to work and at how many activities the Society is engaged in. The Executive Director's report details changes in the Executive office. Whether we choose to compare with other canadian academic societies or with foreign Mathematical Societies, we take considerable pleasure in both the scale and level of function we provide. Examples include our annual meetings and prizes, our active publication programme, sponsored high school competitions and Math Camps (there were 13 this year (2002) with at least one camp by province), the Endowment Fund Grants Competition which has just completed its third set (first full cycle) of awards funding worthy mathematical projects ... and much else. Information on the Competition can be found via Camel at *www.cms.math.ca/Grants/*.

Central, as always, to last year's activities were the Summer and Winter Meetings, again aided by the generous support of the National Programme Committee of the three Canadian Research Institutes (Fields, CRM and PIMS) and the Mathematics of Information Technology and Complex Systems Network (MITACS NCE). We were extremely happy with the results of the last reallocation exercise at NSERC. These positive results owe a lot to the efforts of the community in the last 6 years, and in particular to the leading role of the Steering Committee for pure and applied mathematics and its Chair, Richard Kane, whom I would like to thank in the name of the community. The envelope of the Institutes, GSC 336, and of CSC 337 were increased. In 2002 BIRS started planning its scientific programming. BIRS is going to be exceptionally useful for Canadian Mathematics, and we look forward to the opening in the spring of 2003.

CMS Summer Meeting (Université Laval)
The 2002 Canadian Mathematical Society's Summer Meeting was hosted by Université Laval, from June 15-17, 2002. Our meetings, in addition to their scientific merit, was, as we now always expect, an excellent way to build and maintain friendships within the mathematical community. The meeting included fourteen diverse symposia, contributed papers, five plenary speakers, a public lecture, and two prize lectures. Additionally an Honorary Degree will be awarded to Robert Langlands (IAS). The *Jeffery-Williams Lecture* was given by Ed Perkins, of the University of British Columbia, who was the 1986 Coxeter-James Lecturer. The *Krieger-Nelson Lecture* was given by Priscilla Greenwood (University of British Columbia and Arizona State).

The CMS Winter Meeting (University of Ottawa)
The Canadian Mathematical Society's 2002 Winter Meeting was held at the Marriott Hotel from December 8 to 10, 2002, hosted by the University of Ottawa, the home of the CMS. It was very successful both intellectually and socially. The Coxeter-James Lecture was given by Lisa Jeffrey (University of Toronto). The CMS Doctoral Prize Lecture was given by David Kerr who got his degree from the University of Toronto and is now at the University of Rome. The CMS Distinguished Service Award was presented to Peter Lancaster, University of Calgary. The G. de B. Robinson Award was given to Ted Chinburg, Manfred Kolster and Victor Snaith, for their exceptional paper Comparison of K-theory Galois module structure invariants" published in the Canadian Mathematical Journal in 2000. The public lecture, "Passwords: Are they the weakest links?", was given by Robert Zuccherato from Entrust.

Canada School Mathematics Forum
The Canada School Mathematics Forum will be held at the *Université du Québec à Montréal* (UQAM) on May 16-18 2003 with a follow up meeting in Ontario two years later. The first meeting will bring together roughly 200 people from all provinces and territories representing the different groups with interest in and impact upon mathematical education in elementary, middle and high school (roughly grades K-12). The co-organizers are Christiane Rousseau (UdeM) and George Bluman (UBC), who are building the scientific programme with the help of a strong scientific committee. The local organizing committee (around Louis Charbonneau, UQAM) have done an excellent job.

The intention is for the first meeting to function primarily as an opportunity to compare issues and best practices across the country. It should also identify those issues on which subgroups can prepare more detailed findings to be presented at the second meeting. These findings will be

published electronically and distributed widely. It is hoped that the CMS, through these fora and the connections enhanced by them, can function more actively as a facilitator and clearing house on such educational issues. This, we expect, will be facilitated by the active participation of the three institutes. Although most participants are invited it is possible to apply for participation on the web at *http://www.cms.math.ca/Events/CSMF2003/*

First Canada-France Meeting
At the initiation of Michel Waldschmidt, President of the French Mathematical Society, we are now undertaking a multi-society (pure and applied) meeting in Toulouse on July 12-15, 2004: "*Toulouse 2004: Premier congrès Canada/France des sciences mathématiques*". The meeting will be organized jointly by the French societies SMF (*Société mathématique de France*), SMAI (*Société de mathématiques appliquées et industrielles*), SFdS (*Société française de statistique*) and in Canada by CMS and SSC with the support of CAIMS. Francis Clarke is the meeting director and an exciting scientific program is well under way.

Joint meeting in Halifax
The 2004 Summer Meeting in Dalhousie, Halifax will be held jointly with CAIMS, with the participation of CSHPM (Canadian Society of History and Philosophy of Mathematics) and CSFD (Canadian Symposium of Fluid Dynamics). Richard Wood (CMS) and Patrick Keast (CAIMS) are the meeting directors.

"Math in Moscow"
CMS and NSERC agreed to create the NSERC-CMS "Math in Moscow" scholarships to allow undergraduate or beginning graduate students at a Canadian university to spend a semester at the Moscow Independent University in the "Math in Moscow" program. There will be two competitions a year. One scholarship will be awarded at the fall competition (deadline: September 30) and two in the spring (deadline: April 15). The first competition was held in September 2002. The committee received strong applications and the scholarship was awarded to Jonathan Kavanagh from Memorial University.

New CMS Prize in Excellence in Teaching
At the December meeting the Board approved the creation of a new Prize in Excellence in Teaching supported by Nelson A Thompson Company for a 3 year period. Nominees from CEGEPs or colleges are also eligible. The first call for nominations will be in the fall of 2003 and the first Prize awarded at the Summer meeting of 2004.

General assembly of the IMU
A Canadian delegation of Kenneth Davidson, Nassif Ghoussoub, Jacques Hurtubise, Cameron Stewart and myself attended the general assembly of the IMU in Shanghai. Bernard Hodgson was reelected General Secretary of ICMI (International Commission of Mathematical Instruction). John Friedlander was a candidate for the IMU Executive but unfortunately he was not elected. Jonathan Borwein is Chair of the IMU's *Committee on Electronic Information and Communication.* The CEIC (*www.math.ceic.ca*) continues to make slow, but hopefully steady, progress on its charter, on issues of metadata, digital publishing, copyright and intellectual property. Presentation of the document "*Best current practices: Recommendations on Electronic Information Communication*" was very much appreciated by the members of the Assembly. The Canadian Mathematical Society has had some preliminary discussions with the International Mathematical Union to gauge whether it would favourably view a bid by Canada to host the 2010 International Congress of Mathematicians in Montreal. The IMU has indicated that Montreal would be an acceptable venue, and so we will work closely with the National Research Council of Canada over the next two years to assess the feasibility of this proposal.

ICM 2002 in Beijing
The International Congress of Mathematicians in Beijing last August attracted more than 4000 participants. The Congress began with an opening ceremony in the Great Hall of the People, presided over by Zhi-Ming Ma, President of the Chinese Mathematical Society, with the presence of Jiang Zemin, Chairman of the People's Republic of China, as well as many other high-ranking Chinese dignitaries. Not only did some of the highest-ranking officials of the People's Republic of China make it a point to attend the Congress's opening ceremonies, but the Chinese government contributed the unheard-of sum of $1.2 million US to underwrite the Congress. The Canadian Mathematical Society, the *Centre de recherches mathématiques*, the Fields Institute, and the Pacific Institute of Mathematical Science jointly organized a reception at the Canadian Embassy on August 21 to honour the Fields medallists and the recipient of the Nevanlinna Prize. Mr. Houlden, Minister of Political and Public Affairs at the Embassy recalled the role played by Charles Fields, the organizer of the 1924 International Congress in Toronto, in creating the Fields Medals. He has been extremely impressed by the support given to ICM 2002 by the Chinese officials. We thank Cam Stewart and the CMS staff for their help in preparing the reception: it is more difficult to organize something in a foreign country!

Advancement of Mathematics
[see next report for details]

CMS Books and Tracts
The *CMS Books in Mathematics* series with Springer New York now has twelve volumes published and many others under contract. Reviews will, I am sure, continue to appear

in the CMS Notes. In June 2000, the CMS launched a parallel series of shorter books, *CMS Tracts in Mathematics*, to be published by the American Mathematical Society, edited by Ken Davidson and Cam Stewart. Each series hopes to publish broadly and we should directly invite members of other Canadian mathematical science societies to consider publishing their work through these vehicles. See *www.cms.math.ca/ Publications/*

Executive Director
I'm very pleased to report that, at the December Board Meeting, Graham Wright's appointment as Executive Director for a further year (July 2004 - June 2005) was approved. This will allow the Executive Director's and President's terms not to end at the same time. I want to express my own deep gratitude for all that Graham has offered to the CMS over the past 23 years and for accepting to delay his retirement to help CMS. It is largely because of his extraordinary commitment to the CMS over that very long period, that the Society is in the robust shape that it is. I also express my thanks, and those of the CMS, to the University of Ottawa which has housed and supported the CMS over the past 23 years.

Some Ongoing Issues

Prize Nominations. The present nomination process for our prizes elicits many candidates from some Universities but few if any from others with very good potential nominees. We intend to construct posters to better remind the community of the nomination protocol. That said, I think it is worth emphasizing that making a nomination for one of our awards is itself an excellent way of acknowledging the contributions of one's colleagues, whether or not the nomination is successful. Details about all the prizes and something of their history is to be found at: *www.cms.math.ca/Prizes/*.

Membership. The Society, like many, is experiencing some difficulty in attracting new members. The nature of university affiliation has changed over the last quarter century and we all have many calls on our time and finances. As the retirement of our older members accelerates, this has led us to consider how best to make apparent the value of membership especially to our newer colleagues. Thus, I would ask each of you to consider doing some recruiting in your own institution.

Financial situation of the CMS. Our endowment fund depreciated during the last two years because of the difficult market situation and it is now below 1.5 million. Also the revenue coming from publications is going down because the number of subscriptions is decreasing. Although important efforts are made both to publicize our journals and to increase the quality it is clear that electronic publishing is threatning on our revenues of publications. If we cannot replace these revenues, the CMS may need to cut some of its other activities.

In Conclusion

As will be clear from my report, the Executive Director's and all the committee reports, the Society is for the most part thriving. The year 2003 will see a markedly increased emphasis on fund raising, on membership recruitment, and on joint initiatives with other societies and groups.

Advancement of Mathematics

Christiane Rousseau (Montreal), Chair

The Advancement of Mathematics Committee (AMC) (which, since July 2001, includes the Fundraising Committee as a sub-committee) has been very active during the past year.

Fields Medal Initiative. A dossier asking for the Federal Government to fund the Fields Medal had been sent to the Prime Minister in May 2002 by Keneth Davidson and Jonathan Borwein. A follow-up letter signed by the three directors of the Institutes, by Cameron Stewart and by Christiane Rousseau was sent to the Prime Minister in September requesting Federal Government support for the Fields Medal Endowment Fund. This initiative could also be linked with Montreal's bid for the 2010 ICM. Senator Michael Kirby and the Honourable John Manley, both of whom have a mathematical background, received copies of the request.

Endowment Fund and Potential Endowment Drive. The CMS Endowment Fund is not really an Endowed Fund and the auditors refer to it as a Restricted Fund. The Finance Committee is considering this matter and has recommended that the CMS undertake a major fund raising campaign to drastically increase the amount in the CMS Endowment Fund. This may involve retaining the services of a professional fund raising company which could be quite costly. If $5 million was raised, then $200,000 in fees for professional services was thought reasonable. Possibilities for such an Endowment Drive could be: Capital Project - CMS Building - Endowment of all of the CMS prizes - Endowment of the Fields Medals. The Committee strongly supported such an Endowment Drive. If the CMS were to start by allocating some of the existing Endowment Fund for such projects, this might be seen very positively by potential donors. The Executive Director and the Treasurer have begun to develop appropriate terms of reference for a true Endowment Fund and fundraising ideas for the Endowment Fund, with a view to initiating an Endowment fundraising campaign. Robert Woodrow volunteered to assist in this effort.

How to increase the membership? The practice of offering complimentary memberships has not been successful and the Committee approved a new approach offering two years' membership for the price of one to individuals who have never been a paying member before. The CMS Membership Marketing Plan, developed by Liliane Sousa to develop member recognition and pride was very well received. A suggestion was made to explore Joint CAIMS/CSHPM memberships. Also there is the potential to attract more members from Québec. It was suggested that a letter be sent to all Board members with sufficient membership forms to canvass all colleagues who are not members of CMS. It was also suggested that consideration be given to recognizing, on an annual basis, the department that has the largest percentage increase in membership.It was suggested that departments could be requested to provide an up-to-date list of graduate students and their e-mail addresses so that invitations to join CMS could be forwarded to them in a timely manner. The significant benefit for members resulting from the Reciprocity Agreement with the AMS was noted. The Committee approved the addition of one category in life-time memberships for those who are between 55 and 60 years old.

Institutional membership. There are actually four levels of institutional membership and the Committee is recommending that the fee for non-degree colleges be the same as for undergraduate colleges.

Fund-raising activities. Imperial Oil has increased its support to the National and Regional Math Camps from $25,000 to $35,000 for the next three years. Approaches have been made to life insurance companies and to provincial ministries of education to support our wide array of education activities. Provincial governments and teacher associations are being approached also to support the 2003 Canadian School Mathematics Forum in Montreal.

Math with a Human Face. There has been intensive work by Judith McDonald and Harley Weston to develop "Math with a Human Face" at Math Central and to prepare a new poster on this theme.

Endowment Grant Competitiona. The Review of the Endowment Grant Competition program has taken place. A number of modifications have been made to the application procedure and changes to the Terms of Reference for the Endowment Grants Committee have been approved by the Board.

A prize in History and Philosophy of Mathematics? There has been a suggestion that a prize in the area of History and Philosophy of Mathematics be considered which could be jointly sponsored by CMS and the Canadian Society of the History and Philosophy of Mathematics (CSHPM).

Greater cooperation with CSHPM. It was noted that special sessions on the History of Mathematics are becoming a regular part of the Society's meetings and, to increase cooperation between the CMS and the CSHPM, the expertise of CSHPM could assist in the selection of speakers for any future special sessions of this nature. It was suggested that consideration be given by CMS to having a plenary speaker on the History of Mathematics in the future. Such a plenary talk will be occurring at the CMS/CAIMS Meeting in Halifax in June 2004. Joint meetings in the future should also be considered.

Math Camp Coordinator. The Board has agreed to appoint a Math Camp Coordinator who will ex-officio be a member of the Education Committee and, for the time being, the Mathematical Competitions Committee.

Awards Officer. The Committee considered that it would be desirable for the Society to have an Awards Office and the Executive Director will be developing Terms of Reference for such a position.

CMS Publisher. The need for an individual to fill the position of CMS Publisher has been outlined previously. It may not be possible to find someone to fulfill all of the duties but it may be possible to find an individual who would perform some of the duties. A revised job description for this position with a more resticted focus will be developed.

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Education

Ed Barbeau (Toronto), Chair

The Education Committee secured a place on the program of both the general meetings of the Society in the year 2002 for educational activities.

At the Summer Meeting, held at Laval University in Quebec City, there was a rich session devoted to the teaching and learning of geometry that was organized by Frederic Gourdeau and Bernard Hodgson of Laval University, who invited a roster of seven speakers. David Henderson of Cornell University gave a plenary talk with the title, "How can we encourage students to think like mathematicians?"; he and a colleague Daina Taimina gave a workshop on experiencing geometry. The Society continued its tradition of plenary talks with a multimedia presentation by the popular Québec expositor, Jean-Marie de Koninck.

The session at the CMS Winter Meeting in Ottawa was organized by Tom Steinke of the Ottawa-Carleton District School Board. This looked at the use of technology in the teaching of mathematics, and we were pleased to note that a number of local teachers were able to attend the session.

Unfortunately, the Committee was unable to recommend the awarding of an Adrien Pouliot Award, but it has some individuals in mind who might be eligible to receive this award and will be actively soliciting nominations.

In addition, the Education Committee awarded grants in support of contests that are held in Alberta, Manitoba, Northern Ontario, Quebec, the Maritime provinces and Newfoundland.

At the annual National Science Fair in Saskatoon, in May, 2002, the senior prize was awarded to Andrea Dukeshire of Calgary, Alberta for her project "Stability of Tops", the intermediate to Eugene Savchenko of Ottawa, Omtario for his project "3D Scanner" and the junior to Anthony Chiarelli of the St. Teresa of Avila School in Hamilton, Ontario for his project "Steganography... You Can Look but You Can't See". A number of colleagues from the University of Saskatchewan served as judges: James Brooke, Bjorn Friberg, Franz-Viktor Kuhlman, Salma Kuhlman, John Stephenson and Keith Taylor.

I have completed my term as Chair of the Committee and I am pleased to hand over the responsibility to Richard Caron of the University of Windsor with his best wishes for a successful term.

Electronic Services

Jason I. Brown (Dalhousie), Chair

This year the Electronic Services Committee (ESC) of the Canadian Mathematical Society has provided input on the substantial redesign of the Camel web site. A historical component has been added to the site, as well as the ability to handle committee nominations. Other main changes have been to the infrastructure, including the move to a new server and spam filtering is a priority for 2003. The status of online advertisements and sponsorship are currently under review. The issue of online security and digital certificates for secure transactions is under the advisement of the Camel Manager. The ESC appreciates the ongoing excellent work of both the Camel Manager (Alan Kelm), his staff, and the Director of Electronic Products and Services (Graham Wright).

The standardization of the CMS logo both for print and online usage was raised. The committee gave its recommendations on what format should be used on the camel web site.

Unfortunately, it seems that there may be little to salvage for the Society from the APuRL project, but the Camel Manager is looking into the possibility of incorporating some of the modules, provided adequate documentation can be received.

The TEX Office (to be called the Publications Office effective January 1, 2003) will take over responsibility for the Digital Editorship. The Committee hopes that the transition will be a smooth and beneficial one for the Society. The ESC would like to thank Loki Jorgenson for his service as the Digital Editor over the past several years. The CTAN mirror site on Camel is very popular, as always. There will be a number of items that will arise for online publications, including the use of MathML, and the advice of the Publications Office will be crucial in any decisions. The ESC extends its appreciation to Michael Doob for his work as TEX Editor, and its best wishes to Craig Platt, who is assuming the position of Technical Editor in January 2003.

My term as Chair of the ESC ends on December 31, 2002. I would like to express my appreciation to Edgar Goodaire, Past-Chair of the Committee, to the other members of the ESC (David Rodgers, Gail Wolkowicz, Laurent Marcoux, Peter and Jonathan Borwein, Christiane Rousseau, Eric Woolgar), and to Alan Kelm and Graham Wright. It was a pleasure working with all of you, and I wish David Rodgers a successful and productive term as the incoming Chair. The committee is in excellent hands!

Endowment Grants

Kathryn Hare (Waterloo), Chair

The main task of the Endowment Grants Committee is to adjudicate proposals for projects that are requesting financial support from the CMS Endowment Grants Competition. Projects which are funded must contribute to the goals of the CMS and the broader good of the mathematical community.

The committee was allotted $40,000 for the 2002 Competition. Seven applications were received. Four of these were funded and a total of $23,000 was awarded. All applicants have been notified by the Executive Office in Ottawa.

The successful applications included a conference for women graduate students, a project supporting junior

faculty, a project supporting secondary school teachers in Atlantic Canada, and science fairs in British Columbia. The details of the successful applications can be viewed on the CMS web site (*www.cms.math.ca/Grants/EGC/*). Reports on projects funded in the past can also be found there.

Because of the poor performance of the stock market over the last few years we anticipate that the money available for next year's competition will be significantly reduced. However, it was decided at the December Meeting of the CMS Board of Directors, that there will be a competition in 2003, and that the $17,000 unspent from this year's competition will be available for distribution next year.

It was also agreed to use a portion of the Endowment Fund to support several special projects of the CMS, including the "Math in Moscow" program and the Canadian School Mathematics Forum which will take place in Montréal in May, 2003.

During the year, a review of the Endowment Grants Competition program was carried out by James Timourian (Alberta) and the CMS Executive Committee and this led to some fine tuning in our procedures.

Finance

Michael Lamoureux (Calgary) Chair

The Finance Committee includes among its members the Treasurer, the Executive Director, the President, and the Past-President or the President-Elect. The Committee is responsible for the overall financial activities of the Canadian Mathematical Society, including the annual budget and the Restricted Investment Funds — the Endowment Fund, the Mathematical Olympiad Fund and the Designated Activities Fund. The Committee meets twice a year, in April and October, to discuss the Budget and make recommendations on financial matters to the Executive Committee and the Board of Directors. The Treasurer's Report provides details of the 2002 financial year and the 2003 Budget.

Ian Goulden completed his term in 2002; a new member Dr. Murray Bremner (Saskatchewan) will be joining the Committee in 2003.

The Society's Restricted Investent Funds continue to be managed by Toronto Dominion Quantitative Capital, wholly in indexed funds. Thus, for example, no decisions on individual equities are required. Instead, only the mix between funds is considered periodically. After a decision in 2001 to change the asset mix to 40% Bonds, 10% Canadian Equities and 50% Global Equities, an evaluation of the performance of the fund was made, and a recommendation made to maintain the mix for the current Period.

Proceeds from this Fund are use to finance certain activities of the Society, including the Endowment Grants Competition. The Society has been greatly helped in discussions concerning the maintenance and use of the Fund by our two consultants, Tim Appelt and David Bates, as well as the staff at TDQC.

Serious consideration is being given to undertaking a major fund raising effort to significantly increase the size of the Endowment Fund. This might allow us to do such things as endow the major prizes of the CMS. At this time, preliminary work is being done on the feasibility of such an undertaking.

Taking into account the current market situation and special CMS projects that will be supported from the Endowment Fund for 2003, the Board of Directors, in consultation with the Finance and Endowment Grants Committee and the Executive Committee, decided that the 2003 Endowment Grants Competition should be funded from unused funds from the 2002 Competition and any returned funds from previous competitions.

International Affairs

Cameron Stewart (Waterloo), Chair

The primary concern of the International Affairs Committee in 2002 was the International Congress of Mathematicians at Beijing in August and events related to it.

The Committee chose the Canadian delegation for the 14th General Assembly of the International Mathematical Union held August 17-18 in Shanghai. The delegation consisted of Ken Davidson, Nassif Ghoussoub, Jacques Hurtubise, Christiane Rousseau and Cameron Stewart. George Elliott, the alternate delegate for Canada, was not present in Shanghai. Canada had nominated John Friedlander for a position as a member of the Executive Committee of the IMU and he appeared on the approved slate of seven candidates of whom five were to be elected. Two others, Joram Lindenstrauss (Israel) and Vaughan Jones (USA/New Zealand) were nominated but were not on the approved slate. In the election John Friedlander and Claudio Procesi (Italy) were not chosen. The following five individuals were elected: Andrey Bolibruch (Russia), Martin Grötschel (Germany), Zhi-Ming Ma (China), Ragni Piene (Norway) and Madabusi Raghunathan (India). The balance of the Executive Committee for 2003-2006 consists of the President John Ball (United Kingdom), Vice-Presidents Jean-Michel Bismut (France) and Masaki Kashiwara (Japan) and the Secretary Phillip A. Griffiths (USA).

Bernard Hodgson was re-appointed as Secretary of the International Commission on Mathematical Instruction. Jonathan Borwein, a continuing member of the Committee on Electronic Information and Communication, is now Chair of this Committee. They remain the only Canadians on major committees of the IMU.

With the help of Graham Wright, Christiane Rousseau, Jonathan Borwein, and the institutes, the CMS organized a reception at the Canadian Embassy in Beijing on August 21 to honour the winners of the Fields Medals and the Nevanlinna Prize. This proved to be a very challenging undertaking but I am happy to reports that about 90 attended the event and it was a considerable success. The reception was jointly sponsored by the CMS, the CRM, The Fields Institute, and PIMS.

The Committee is considering ways to obtain a better representation of Canadian speakers at each ICM as well as increase Canadian participation on the major committees of the IMU.

Mathematical Competitions

Peter Cass (Western) Chair

The Mathematical Competitions Committee (MCC) 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 the MCC include the Mathematical Olympiads' Correspondence Program, and the National and Regional Mathematics Camps. At the 2002 CMS Winter Meeting, the Board of Directors, acting on a recommendation of the Executive Committee, approved the idea of appointing a "Math. Camps Coordinator" who would be, ex-officio, a member of the Education Committee and the Mathematical Competitions Committee. Terms of Reference for such a position are being developed and it is hoped that a Math. Camps Coordinator will be named shortly. After such an appointment is made, the MCC will be relieved of direct responsibility for these math camps.

Much of the work of the MCC is done by the four sub-committees and the Correspondence Program Coordinator. Further information, including press releases, on most of the topics in this report can be found through the CMS Competitions web page (*www.cms.math.ca/Competitions/*).

The Canadian Mathematical Olympiad
The 34th Canadian Mathematical Olympiad (CMO) was held on March 27th, 2002. There were 80 competitors from 47 schools in eight provinces. The top three students were: **Tianyi (David) Han**, Woburn Collegiate Institute, ON (First Prize: The Sun Life Cup, $2000, and book prizes.) **Roger Mong**, Don Mills Collegiate Institute, ON (Second Prize: $1500 and book prizes.) **Paul Cheng**, West Vancouver Secondary School, BC (Third Prize: $1000 and book prizes.)

A detailed report on the 2002 CMO, including the exam paper, solutions to the problems, and graders' reports is available at *www.cms.math.ca/Competitions/CM0/*

The Asian Pacific Mathematics Olympiad
The 2002 Asian Pacific Mathematics Olympiad (APMO) was written in March.

As reported in the 2001 CMS Annual Report of the Mathematical Competitions Committee, there were problems of security with the 2001 APMO (Columbia was the coordinating country for the 2001 APMO. Canada, taking over for a three year term, was the coordinating country for the 2002 APMO.) For example, some of the problems were posted on an internet site before some countries had written the paper. Consequently, the results for the 2001 APMO were nullified. For the 2002 APMO some changes to procedure were recommended and were implemented for the 2002 contest. This included a shorter period in which the contest could be written, from a week to three days. Nevertheless, there were similar security problems with the 2002 APMO. Consequently, the results were again nullified.

At a meeting in Glasgow during the 2002 IMO, which involved the APMO participating countries, it was agreed that, in future, the APMO would be held in the afternoon of one day on one side of the date line and in the morning of the next day on the other side of the date-line. The two times would be arranged so that they would be as close together as reasonably possible. Further, at the meeting in Glasgow, those responsible for the administration of the APMO in the various countries were warned that future irregularities would incur consequences.

The results from the 2002 APMO for the Canadian students were compiled and were one of the factors in selecting the 2002 Canadian IMO team.

Discussion is underway to include Kazakhstan among the countries participating in the APMO.

Further details about the APMO are available at:
www.cms. math.ca/Competions/APMO/

The International Mathematical Olympiad
The 43rd International Mathematical Olympiad was held in Glasgow, U.K. July 19-30, 2002. The Canadian team placed 12th out of 84 participating countries with a team score of 142 (maximum 252). The members of the Canadian team and their results were: **Robert Barrington-Leigh**, Old Scona Academic High School, Edmonton (Bronze); **Olena Bormashenko**, Don Mills Collegiate Institute, Toronto (Silver); **Alexander Fink**, Queen Elizabeth High School, Calgary (Silver) ; **Ralph Furmaniak**, John Paul II Secondary School, London (Honourable Mention), **Tianyi (David) Han**, Woburn Collegiate Institute, Toronto (Silver) ; **Roger Mong**, Don Mills Collegiate Institute, Toronto (Gold).

The 2002 team was accompanied by Arthur Baragar (University of Nevada) Leader; Naoki Sato (Toronto) Deputy Leader; Bill Sands (University of Calgary) Leader Observer; Robert Morewood (Burnaby Secondary School) Deputy Leader Observer.

The Canadian results for the 2002 IMO were outstanding and could be regarded as Canada's best ever showing. Further details are available at: *www.cms.math.ca/ Competitions/IMO/*

IMO Training Camps
Two training camps are held each year to prepare students for the annual IMO. The CMS Winter 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. To avoid confusion with the Society's other math camps, the MCC agreed that the IMO Training Camps be renamed "The Winter Training Seminar" and "The Summer IMO Training Seminar." Certificates of Participation will be given to each student who attends these seminars.

Mathematical Olympiads' Correspondence Programme
The Mathematical Olympiads' Correspondence Programme (MOCP) is a problems based correspondence programme. 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. Dr. Edward Barbeau has been Coordinator of this programme for many years. There were more students participating this year than in the past. Thirty-seven wrote the summer set of problems and 45-50 wrote the winter set. About 10 sets of problems have been made up for future use. The availability of material in French is an issue. The Mathematical Competitions Committee discussed this at its meeting at the 2002 CMS Winter Meeting. Edward Barbeau and Matthieu Dufour have undertaken to address this issue. Further details are available at: *www.cms.math.ca/Competions/MOCP/*

ESSO/CMS Math Camps
As reported above, the National and Regional Math. Camps program will eventually be the responsibility of a new "Math Camps Coordinator."

The Imperial Oil Charitable Foundation has generously been the Title Sponsor for these camps since 1999, and has agreed to increase its support for 2003 to 2005.

The **National Math Camp** is designed primarily for younger Canadian students with at least two years remaining in high school and with the potential to compete at the mathematical Olympiad level. Participation in the camp is by invitation only. In 2003, students from grades 8 to 10 will be invited. The initial selection (about 10 students) will be made from the results in the Canadian Open Mathematics Challenge. Other students (about 15) will be selected based on the Galois Contest. Other contest information, and recommendations from Regional Math Camp directors will also be considered. Normally at most two students from a particular school will be invited.

During June 15-22, 2002 the fifth annual CMS National Math Camp took place at Huron College (on the Campus of The University of Western Ontario). The camp was organized and run by Tom Griffiths, Marlene Griffiths, and Richard Hoshino.

In addition to the National Math Camp, Regional Math Camps were held at the following universities:

University of Regina; The University of New Brunswick; University of Prince Edward Island; Sir Wilfred Grenfell College; Collège Jean-de Brébeuf; Simon Fraser University; Dalhousie University; University of Ottawa; University of Western Ontario; Brock University; University of Alberta; University of Manitoba.

The format and length of these camps varied considerably: from 2 day non-residential to 6 day residential camps.

All of these institutions (the University of Alberta alternates with the University of Calgary) together with possibly a new camp in Québec, plan to hold camps in 2003. This attests to the considerable success of this venture. Further details can be obtained at: *www.cms.math.ca/ MathCamps/*

The Canadian Open Mathematics Challenge (COMC)
The COMC is a contest written every year at the end of November. 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 used in the selection of students for the Winter Training Seminar and for the National Math Camp held in the summer. Almost 6000 students from all across Canada and abroad wrote the 2002 COMC. Further details can be obtained at: *www.cms.math.ca/Competitions/COMC/*

Thanks
It is apparent that the Mathematical Competitions Committee and particularly its subcommittees are very active. I would like to thank all members for the enthusiasm and hard work in making everything run very smoothly. No small measure of thanks is also due to the staff at the CMS Executive Office and to the Executive Director, Graham Wright for their dedication.

Nominating

Anthony Lau (Alberta), Chair

The Nominating Committee for the Year 2002 has been very busy filling chairs and memberships of various committees including:

Human Right Officer; Endowment Grants Committee; Finance Committee; International Affairs Committee; Research Committee; Committee on Women in Mathematics; Mathematics Competitions Committee; Advancement of Mathematics Committee; Education Committee.

For the 2003 Election of the Canadian Mathematical Society, the Committee has nominated a candidate for President and four candidates for Vice-Presidents. We are now in the process of completing the slate for members of the Board of Directors for the four regions in Canada and for the member at large. The Committee has also nominated the students representatives on the Board of Directors as well as approved the members of the Student Committee.

The Committee has worked hard to maintain regional balance for various committees.

Publications

Keith Taylor (Saskatchewan), Chair

The Publications Committee oversees the publishing activities of the Society. The publications of the Society together with the respective editors-in-chief for 2002 were:

- The Canadian Journal of Mathematics (Henri Darmon and Niky Kamran)
- The Canadian Mathematical Bulletin (James Lewis, Arturo Pianzola and Noriko Yui)
- Crux Mathematicorum with Mathematical Mayhem (Bruce Shawyer)
- CMS Book Series (Jonathan Borwein and Peter Borwein)
- CMS Tracts in Mathematics (Kenneth Davidson and Cameron Stewart),
- CMS Notes (Peter Fillmore and Srivinasta Swaminathan)
- A Taste of Mathematics (A. Thompson).

The G. de B. Robinson 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 Journal and in odd numbered years, for an article published in the Bulletin. The 2002 Prize was awarded to Ted Chinburg (Pennsylvania); Manfred Kolste (McMaster); Victor Snaith (Southampton), *Comparison of K-theory Galois module structure invariant*s. Canad. J. Math. 52 (2000), No. 1, 47-91.

The following editorial appointments were recommended by the Committee and approved by the Board of Directors:

- Scientific Editorial Board for the CJM and CMB: Walter Craig (McMaster);
- Publications Office: Craig Platt (Manitoba) as Technical Editor, Michael Doob (Manitoba) as Technical Consultant, and Srinivasa Swaminathan (Dalhousie) as Associate Technical Editor;
- CMS Notes: Robert Dawson (St. Mary's) and Srinivasa Swaminathan (Dalhousie) as Editors-in-Chief;
- Crux Mathematicorum with Mathematical Mayhem Board: Jim Totten (University College of the Cariboo) as Editor-in-Chief, Bruce Crofoot (University College of the Cariboo) as Associate Editor, and Rick Brewster as Problem Editors;
- ATOM (A Taste of Mathematics): B. Shawyer (Memorial) was named Editor-in-Chief effective January 1, 2003.

My term finishes at the end of 2002 and Dana Schlomiuk (Montreal) will be taking over as Chair of the Publications Committee from January 1, 2003.

Research

Douglas Stinson (Waterloo), Chair

The 2002 Summer Meeting of the CMS was held in Quebec City. The meeting was hosted by Laval University with Claude Levesque as the Meeting Director and Jean-Pierre Carmichael as Chair, Local Arrangements. There were 14 sessions and Contributed Paper Sessions organized by the Meeting Director (see details in the *CMS Notes* – February 2002 Vol. 34, No. 1, pp. 22 – 24)

The CMS 2002 Jeffery-Williams Prize Lecture was given by Edwin Perkins (University of British Columbia.) and the CMS 2002 Krieger-Nelson Prize Lecture was given by Priscilla Greenwood (University of British Columbia and Arizona State University).

The plenary speakers were: David W. Henderson (Cornell University); Nikolai Nikolski (University of Bordeaux 1, Steklov Inst.); Christophe Reutenauer (Université du Québec à Montréal); Paul D. Seymour (Princeton University); Isadore M. Singer (MIT); Robert P. Langlands (IAS) received an honoris causa doctorate from Laval University during the meeting.

The 2002 Winter Meeting of the CMS was held in Ottawa and was hosted by the University of Ottawa. Dr. Daniel Daigle was the Meeting Director and Walter Burgess and André Dabrowski were in charge of Local Arrangements. In addition a Contributed Paper Session was organized by Walter Burgess (see details in *CMS Notes*, September 2002, Vol. 34, No. 5, pp. 19-22).

The CMS 2002 Coxeter-James Prize Lecture was given by Lisa Jeffrey (University of Toronto) and the CMS 2002 Doctoral Prize Lecture was given by David Kerr (University of Tokyo and University of Rome).

The plenary speakers were: James Arthur (University of Toronto); Rene Carmona (Princeton University); Victor Guillemin (MIT); Maciej Zworski (Berkeley University).

The next four meetings of the CMS will be held in Edmonton (University of Alberta, Summer 2003), Vancouver (Simon Fraser University, Winter 2003), Halifax (Dalhousie University, Summer 2004) and Montreal (McGill University, Winter 2004)

The Research Committee chose Jingyi Chen (UBC) as the 2003 Coxeter-James Prize Lecturer for the CMS Winter 2003 Meeting, and Joel Feldman (UBC) as the 2004 Jeffery-Williams Prize Lecturer for the CMS Summer 2004 Meeting.

The Committee recommended, and this was passed by the CMS Board of Directors, that the eligibility rules for the Coxeter-James Prize Lecture be amended to require that the winner should be no more than 10 years past his or her PhD at the time when the prize selection is made.

The Research Committee passed the following motion, which is being submitted to the CMS Executive Committee and the Board of Directors for their consideration:

> "That the terms of reference for the Jeffery-Williams, Coxeter-James and Krieger-Nelson prize lectureships be revised to require that the winner be a member of the Canadian mathematical community".

The intention of this motion is that winners need not be "in Canada", but should have a clear and real connection to the Canadian research community. This also would create a uniform requirement for the three prize lectureships.

Student

Susan Cooper (Queen's) and Robert Juricevic (Waterloo), Co-Chairs

This is the fourth annual report of Student Committee (Studc). Although there are other committees, such as Education, Advancement of Math, etc., which are related to student issues, Studc plays a direct role in issues regarding students. Information on the goals of Studc and its membership can be found on the CMS web site: *www.cms.math.ca/Students*

Change of membership. Studc underwent its second change in membership. As part of this change, Studc experienced its first change in chairs. We take this moment to thank Dan Piché, founder and past chair of the Student Committee, for all his hard work. Dan's enthusiasm is what made Studc the successful Committee it is today. Dan's CMS legacy will be his work with the CUMC, Studc, and his work as a student representative on the CMS Board of Directors. Dan will stay on our committee until June 2003 in order to ease transition.

The Student Committee is now being co-chaired by Susan Cooper and Robert Juricevic.

We thank all past members, in particular Andy Culham who organized a fantastic CUMC last spring, David Morgan and Benoit Charbonneau for continuing to help us. We have 1 vacancy to fill at present and we will have 3 additional vacancies to fill this June, namely for Renato, Dan, and Boris.

Operations Manual for the Student Committee. Dan Piché is working on an operations manual for the Committee. This manual will describe the Student Committee activities so that each transition of membership will go smoothly.

Student Newsletter. Our newsletter editor, Antoine Khalil, is working on the October 2002 and March 2003 newsletters. Antoine's first newsletter, the October 2002 newsletter, has not yet been published. It will be modified by Antoine in order to include our comments from this past CMS Winter meeting in Ottawa. The October 2002 newsletter will be distributed in January 2003.

Graduate Student Events. Studc organized a social event for graduate students at each of the CMS meetings in 2002. The events were well attended and enjoyed. The Committee plans to continue to organize these events. Susan and Robert will be organizing the next event in Edmonton.

Regional Conferences. The goal of this project is to financially support 4 student activities (one in each of the 4 regions across Canada). In 2002 we supported two regional conferences: the IAM-CSC-PIMS Undergraduate Math Modelling Workshop and the APICS conference. An amount of $150 was given to each group. The Committee hopes to support 4 events in 2003. Youness Lamzouri will be looking after these affairs.

Promotional Poster. Renato Dedic will begin work on a Studc promotional poster. He has been working with Judith MacDonald and Harley Weston on a poster project on careers in mathematics – "Mathematics with a Human Face". Examples can be found at:
http://mathcentral.uregina.ca/HumanFace/careers/quilt/.

Renato clarifies that the goal was and still is to find as many people (mathematicians) as possible who would be willing to add their profile to the page. In particular recent mathematics graduates.

Maintaining a Student Web Site
(www.cms.math.ca/Students/)
Boris Reitman worked with Andy Culham, the past CUMC organizer, to enable CUMC participants to register and submit their abstracts via the CUMC webpage. He did a masterfull job and plans to work with Joy Abramson this spring for CUMC 2003. Furthermore, he will be actively working to update our Studc Website.

CUMC

The Student Committee again provided funding for the CUMC. $1,000 was given to put towards the organizing of CUMC 2002. CUMC 2002 was held at the University of Calgary from July 2 to July 7. The conference was well attended. Photos of the conference can be seen on our website.

Dan Piché, Benoit Charbonneau, and the CUMC 2002 Committee developed an operations manual for CUMC organizers. This manual will assist future CUMC organizers. We hope that the CUMC operations manual will aid in the continuity of the CUMC.

CUMC 2003 will be held May 27 to June 1 at York University (see *www.cumc.math.ca*). CUMC 2003 will be the 10th anniversary of CUMC!

Women in Mathematics

Malgorzata Dubiel (Simon Fraser), Chair

The Committee on Women in Mathematics is charged with monitoring the status of women within the Canadian mathematical community and the Society, recommending and initiating actions which will ensure equitable treatment of women, and with encouraging the participation of women in mathematics at all levels.

The Committee continues to maintain the Directory of Canadian Women in the Mathematical Sciences: a collection of web pages of Canadian women who are actively involved in research or studies in mathematics, or any other aspects of mathematical sciences. The Directory is a valuable source for information about Canadian women mathematicians.

The committee initiated discussions with the CMS Student Committee on the issues of concern for women graduate students in the mathematical sciences across Canada. One result of these talks was an idea of a conference which would bring the students and women faculty together, to address these issues and initiate networking and mentoring connections.

The conference will take place from June 12th to 13th, immediately prior to the CMS 2003 Summer Meeting. The Department of Mathematical and Statistical Sciences, University of Alberta is the host for this meeting which is also supported by the Pacific Institute for the Mathematical Sciences and Simon Fraser University. Plenary talks will be given by Priscilla Greenwood and Christiane Rousseau.

I wish to thank Neal Madras (York) who ended his term on the Committee in December 2002 and to welcome Mateja Sajna (Ottawa) who will join the Committee in January 2003.

CANADIAN PUTNAM RESULTS

Two Canadian university teams placed among the top ten in the 2002 Putnam Competition.

Honorable Mentions went to the teams of the University of Waterloo consisting of **Lino Demasi**, **Shu Niu** and **Karen Yeats**, and the University of Toronto consisting of **Jimmy C. Chui**, **Jonathan Sparling** and **Manuel Zamfir**. Congratulations go to **Alexander R. Fink** of the University of Calgary who ranked in the first ten after the five Putnam Fellows, and qualifies for an award of $1000. Four students obtained honorable mention: **Daniel S. Brox** of the University of British Columbia, **Jimmy C. Chui** of the University of Toronto, **Lino Demasi** of the University of Waterloo and **Roger S. Mong** of the University of Toronto. Other students ranking among the top hundred were **Simon H. Lambert** of the University of Alberta, **Jonathan R. Sparling** of the University of Toronto, **Shu Niu** of the University of Waterloo, and **Thomas P. Waterhouse** of the University of Waterloo.

In all there were 23 Canadian students among the top 210 contestants. The top team in the Putnam Competition was, once again, that of Harvard University. But the Duke University team came in third with the able contribution of **David Arthur**, a former Canadian contestant in the International Mathematical Olympiad. Another former Canadian Olympian was **David G. Pritchard**, now a student at the Massachusetts Institute of Technology, who received honorable mention. A total of 3349 students from 476 colleges and universities in North America took part.

MOST CITED MATHEMATICIANS

Two Canadian mathematicians, Jonathan Borwein (SFU) and J.N.K. Rao (Carleton), appear in the ISIHighlyCited.com's list of the 231 researchers Highly Cited for their articles in the Mathematics category.
http://isihighlycited.com/isi_copy/Comm_news26.htm

RÉUNION D'HIVER DE LA SMC du 6 au 8 DÉCEMBRE 2003

Université Simon Fraser, Harbour Centre, Vancouver, Colombie-Britannique

Voici le programme provisoire de la Réunion d'hiver 2003 de la Société mathématique du Canada. La Réunion aura lieu au Campus Harbour Centre de l'Université Simon Fraser, au centre-ville de Vancouver, Colombie-Britannique. La première annonce paraîtra dans le numéro de septembre 2003 des *Notes de la SMC* et sur notre site Web: *http://www.smc.math.ca/Reunions/hiver03*.

Hôte : Département de mathématiques et de statistique, Université Simon Fraser.

Conférenciers principaux : **Tom Archibald** (Acadia University) ;
Robert Calderbank (AT&T Laboratories, NJ) ;
Andrew Granville (Université de Montréal) ;
Madhu Sudan (MIT).

Prix : **Conférence Coxeter-James: Jingyi Chen** (Université de la Colombie-Britannique) ;
Prix de doctorat et le **Prix Adrien-Pouliot**.

Symposium :

Combinatoire : Organisateurs – Petr Lisonek (SFU) et Brett Stevens (Carleton) ;

Algèbre computationnelle : Organisateur – Michael Monagan (SFU) ;

Systèmes dynamiques : Organisateur – Florin Diacu (Victoria) ;

Enseignement des mathématiques : Organisateur – Malgorzata Dubiel (SFU) ;

Graphes et matroïdes : Organisateurs – Luis Goddyn (SFU) et Ladislav Stacho (SFU) ;

Analyse harmonique : Organisateurs – Isabella Laba (UBC) and Alex Iosevich (Missouri at Columbia) ;

Histoire des mathématiques : Organisateur – Len Berggren (SFU) ;

Biologie mathématique : Organisateur – Leah Keshet (UBC) ;

Modèles pour la dynamique des fluides atmosphériques : Organisateur – David Muraki (SFU) ;

Équations aux dérivées partielles non linéaires : Organisateurs – Rustum Choksi (SFU) et Keith Promislow (SFU) ;

Théorie des nombres : Organisateurs – Michael Bennett (UBC), Peter Borwein (SFU), David Boyd (UBC), Imin Chen (SFU), et Stephen Choi (SFU) ;

Algèbres d'opérateurs : Organisateurs – Marcelo Laca (Victoria) et Ian Putnam (Victoria) ;

Cohomologie quantique et symétrie miroir : Organisateur – Kai Behrend (UBC) ;

Représentations d'algèbres associative et sujets connexes : Organisateurs – Vlastimil Dlab (Carleton) et Shiping Liu (Sherbrooke) ;

Algèbre universelle et théorie des treillis : Organisateur – Jennifer Hyndman (UNBC).

Communications libres : Organisateur – Steven Ruuth (SFU).

Mini-cours « Cryptologie »

Conférenciers :
Doug Stinson (Waterloo) – Introduction à la cryptologie ;
Neal Koblitz (Washington) – Cryptologie par courbes elliptiques ;
Hugh Williams (Calgary) – Théorie des nombres algorithmique ;
Mike Mosca (Waterloo) – Informatique quantique et cryptologie quantique.

Directeur de Réunion : Norman Reilly (Simon Fraser).

Logistique locale : Malgorzata Dubiel (Simon Fraser).

CMS WINTER MEETING 2003 DECEMBER 6 – 8

Simon Fraser University, Harbour Centre, Vancouver, British Columbia

We are happy to announce the provisional outline for the Canadian Mathematical Society Winter Meeting 2003, to be held at Simon Fraser University's Harbour Centre Campus, in downtown Vancouver, British Columbia. Look for the First Announcement in the September 2003 issue of the *CMS Notes* and at *http://ww.cms.math.ca/ Events/winter03/.*

Host: Department of Mathematics and Statistics, Simon Fraser University.

Plenary Lectures: **Tom Archibald** (Acadia University);
Robert Calderbank (AT&T Laboratories, NJ);
Andrew Granville (University of Montreal);
Madhu Sudan (MIT).

Prizes: **Coxeter-James Lecture: Jingyi Chen** (University of British Columbia);
Doctoral Prize Lecture, and the **Adrien Pouliot Prize**.

Symposia:

Combinatorics: Organizers – Petr Lisonek (SFU) and Brett Stevens (Carleton);

Computer Algebra: Organizer – Michael Monagan (SFU);

Dynamical Systems: Organizer – Florin Diacu (Victoria);

Education: Organizer – Malgorzata Dubiel (SFU);

Graphs and Matroids: Organizers – Luis Goddyn (SFU) and Ladislav Stacho (SFU);

Harmonic Analysis: Organizers – Isabella Laba (UBC) and Alex Iosevich (Missouri at Columbia);

History of Mathematics: Organizer – Len Berggren (SFU);

Mathematical Biology: Organizer – Leah Keshet (UBC);

Models for Atmospheric Fluid Dynamics: Organizer – David Muraki (SFU);

Nonlinear Partial Differential Equations: Organizers – Rustum Choksi (SFU) and Keith Promislow (SFU);

Number Theory: Organizers – Michael Bennett (UBC), Peter Borwein (SFU), David Boyd (UBC), Imin Chen (SFU), and Stephen Choi (SFU);

Operator Algebras: Organizers – Marcelo Laca (Victoria) and Ian Putnam (Victoria);

Quantum Cohomology and Mirror Symmetry: Organizer – Kai Behrend (UBC);

Representations of Associative Algebras and Related Topics: Organizers – Vlastimil Dlab (Carleton), and Shiping Liu (Sherbrooke);

Universal Algebra and Lattice Theory: Organizer – Jennifer Hyndman (UNBC).

Contributed Papers: Organizer – Steven Ruuth (SFU).

Short Course "Cryptography"

Speakers:
Doug Stinson (Waterloo) – Introduction to Cryptography;
Neal Koblitz (Washington) – Elliptic Curve Cryptography;
Hugh Williams (Calgary) – Algorithmic Number Theory;
Mike Mosca (Waterloo) – Quantum Computing and Quantum Cryptography.

Meeting Director: Norman Reilly (Simon Fraser).

Local Arrangements: Malgorzata Dubiel (Simon Fraser).

FROM THE PRESIDENT'S DESK

My annual report describes the many activities that have taken place in 2002 and will look at what's coming up in 2003. I will also pass on some last-minute news.

The Canadian School Mathematics Forum will be held at UQAM on May 16-18, 2003. The Forum has five main themes. The first theme, "Comparison of experiences," will consist of a plenary lecture by Liping Ma on differences between the Chinese and U.S. models, followed by a panel discussion on the situation in various regions of the country. The second theme, "Critical thinking," will feature a plenary lecture by Jean-Pierre Kahane, chairman of the "Kahane" commission formed by the French Department of Education to make recommendations on the reform of mathematics programs in French primary and secondary schools. The third theme, "Mathematics in the modern school: goals and challenges," will offer a panel discussion as the plenary activity. The fourth theme will focus on the education and professional development of teachers; it will feature as plenary speakers the duo of mathematician Hyman Bass and educator Deborah Ball, regarded as two of the top U.S. experts in this field. The 200 Forum participants will be divided into working groups of 10 to 20 people. Each group will meet three times: once after each plenary activity under themes 2, 3 and 4. The working groups will cover a broad range of issues in mathematics teaching, from mathematics for active citizenship to the needs of industry. One working group will focus specifically on the challenges of teaching mathematics in aboriginal communities and on the need to take account of cultural differences in teaching strategies. Direction for this working group will be provided by: Corinne Jetté, founder and director of the Concordia Native Access Engineering Program; Dawn Wiseman, the coordinator of the same program; Ed Doolittle, Director of the Department of Mathematics at Saskatchewan Indian Federated College; Jim Barta of the State University of Utah and a specialist in teaching aboriginal Americans; and Louise Poirier of the University of Montreal, who frequently visits the Innu of Nunavik. The public lecture will be given by Jean-Marie de Koninck. The fifth theme will focus on developing a "Vision for the future" and will include two panel discussions. The first, chaired by Katherine Heinrich, will focus on solutions, such as better coordination among the various levels of education and more inter-provincial cooperation, as well as on the issues surrounding the creation of a Canadian sub-commission of the ICMI (International Commission on Mathematical Instruction). The second panel will examine the question of "How to bring the ideas of the Forum to the public." Among the panellists will be Isabelle Blain, Vice-President of NSERC, Heather Sokoloff of the National Post, and Ivar Ekeland of UBC. The complete program for the Forum is available on the web at *www.smc.math.ca/Reunions/ FCEM2003.*

On 28 February 2003, the Canadian mathematical community gathered in Banff to mark the opening of BIRS, the Banff International Research Station. This station was founded by the Pacific Institute for Mathematical Sciences (PIMS) and Berkley's Mathematical Sciences Research Institute (MSRI), thanks to the vision and leadership of Nassif Ghoussoub, Director of the PIMS and David Eisenbud, Director of the MSRI. The Banff station will be the North American equivalent of the Oberwolfach mathematical centre in Germany and the Luminy centres in France. It is partially funded by NSERC in Canada, the NSF in the United States, the province of Alberta through ASRA (Alberta Science Research Authority), the PIMS and MITACS. The station will start to host mathematical meetings on 15 March 2003 and will be in operation 40 weeks a year. Robert Moody is the Scientific Director and Nassif Ghoussoub the Executive Director. The training camp for the Canadian team competing in the International Olympiad will be held at BIRS this July.

Our next meeting will be in Edmonton in June and will include 13 symposia. There is still time for you to sign up or send your students.

As we go to press with this issue, we have received the sad news of the passing of Professor Donald Coxeter (Professor at the University of Toronto and the CMS' 7th President from 1965 to 1967) on April 1, 2003 in Toronto.

An obituary will be published in the September 2003 issue of the *CMS Notes.*

RAPPORT DU VICE-PRÉSIDENT

James Mingo

« L'idéalisme de l'étudiant de premier cycle, son empressement à faire quelque chose pour son collège, pour son pays ou pour toute cause qui le passionne suscite constamment l'admiration des dirigeants universitaires. Il est reconnu que cette impulsion désintéressée est l'une des grandes forces des étudiants, et que ceux-ci accomplissent de grandes choses grâce à elle. »

C'est sur ces paroles que commence l'article de William Lowell Putnam, publié en 1921, dans lequel il proposait la création d'un concours intellectuel par équipe entre universités. De toute évidence, M. Putnam songeait à un concours s'apparentant à une partie de football Harvard-Yale, que Harvard remporterait. Après deux concours expérimentaux en 1928 et en 1933, le concours Putnam tel qu'on le connaît aujourd'hui naissait en 1938.

« Young Einsteins » John Coleman, Nathan Mendelsohn, et Irving Kaplansky
Photo reproduite du Toronto Star (janvier 1939)

Ainsi, le 18 avril prochain marquera le 65e anniversaire de ce concours. L'équipe gagnante de la première édition se composait de John Coleman, Irving Kaplansky et Nathan Mendelsohn, alors étudiants à l'Université de Toronto. Cette université a remporté le concours trois autres fois, et deux autres universités canadiennes seulement ont gagné le Putnam : Queen's (1952) et Waterloo (1974 et 1999). Même si Harvard a mis sept ans à remporter sa première victoire, W. L. Putnam serait heureux aujourd'hui de savoir qu'elle a gagné 13 des 20 derniers concours.

Certaines des questions du premier examen seront familières aux professeurs de calcul différentiel et intégral. Par exemple, la question 5 de la séance du matin demandait aux concurrents de trouver la limite de n^2/e^n si n tend vers l'infini; et la question 6 se lisait comme suit :

Un nageur est debout, au coin d'une piscine carrée, et veut atteindre le coin opposé. Si w est sa vitesse de marche et s, sa vitesse de nage ($s < w$), trouvez le tracé qui lui permettra d'arriver le plus rapidement.

Considérons deux possibilités :
(i) $w/s < \sqrt{2}$, and (ii) $w/s > \sqrt{2}$.]

Aujourd'hui, bien sûr, les questions sont plus difficiles, et le résultat médian pour l'année 2002, dans un groupe de plus de 3 000 concurrents, était de 3.

En 1938, John Coleman et Nathan Mendelsohn étaient en troisième année, et Irving Kaplansky en quatrième. Irving Kaplansky a été le premier lauréat de la bourse Putnam, remise à un étudiant qui se classait dans les cinq premiers. Les règlements de l'époque empêchaient MM. Coleman, Kaplansky et Mendelsohn, en tant que membres de l'équipe gagnante, de participer l'année suivante. Mentionnons toutefois que tous trois sont devenus de grands administrateurs et mathématiciens.

Selon John Coleman, le succès de Toronto dans les premières années était attribuable à deux aspects du système d'éducation ontarien de l'époque. Le premier était la formation scientifique de haut niveau des enseignants du secondaire de la province, peut-être parce qu'il s'agissait alors d'une des rares professions offertes aux passionnés de mathématiques. Le deuxième était le programme de mathématiques, de physique et de chimie (MPC) de l'Université de Toronto, programme stimulant qui attirait des étudiants doués aspirant à une formation scientifique rigoureuse.

Irving Kaplansky se rappelle que Samuel Beatty, alors chef du département, avait le concours très à cœur et organisait des séances d'entraînement. Qui plus est, le programme de MPC offrait aux étudiants une formation en mathématiques classiques un peu à l'instar des « Tripos » de Cambridge. Les étudiants de Toronto avaient donc plus d'expérience que ceux d'autres programmes à ce moment-là.

Il se rappelle aussi que la victoire avait fait couler beaucoup d'encre dans les médias locaux, et qu'un journal y ait même consacré deux pleines pages. Canon Cody, recteur de l'Université, a félicité personnellement les gagnants en soulignant que leur victoire justifiait la politique de l'établissement de ne pas faire de discrimination contre les étudiants juifs. Irving Kaplansky se souvient aussi avoir dit à William Cody, le quatrième étudiant de l'équipe de Toronto, qu'il avait trouvé le premier examen trop facile.

Nathan Mendelsohn se souvient de sa joie d'être choisi pour faire partie de l'équipe du Putnam : « En 1938 ou à la fin de 1937, le professeur Beatty a annoncé qu'un concours de mathématiques aurait lieu tous les ans, auquel pourrait participer chacune des universités d'Amérique du Nord, représentée par une équipe de trois étudiants. Seuls les membres officiels de l'équipe seraient autorisés à participer. Il s'appellerait le concours William Lowell

Putnam. Quand j'ai su que je ferais partie de l'équipe, j'étais très excité, mais aussi intrigué, car aucun autre concours ne pourrait m'aider à me préparer. J'ai finalement décidé de m'attaquer à la résolution des 100 problèmes du professeur Beatty. Il distribuait ces problèmes en classe et demandait à ses étudiants de les résoudre. Ces problèmes ont ensuite été publiés dans le compte rendu du premier congrès canadien de mathématiques en 1946. Pour illustrer leur degré de difficulté, voyez le problème suivant, qui faisait partie de la liste distribuée à une classe de première année du baccalauréat spécialisé. »

Given n positive numbers $a_1, a_2, \ldots, a_n$ *show that the sum* $\sum 1/(a_1(a_1 + a_2)(a_1 + a_2 + a_3)\cdots(a_1 + a_2 + a_3 + \cdots + a_n))$, *taken over all permutations of* $a_1, a_2, \ldots, a_n$, *is* $1/(a_1 a_2 \ldots a_n)$.

La Société a invité MM. Coleman, Mendelsohn et Kaplansky à des retrouvailles qui auront lieu dans le cadre de la Réunion de juin à Edmonton.

John Coleman est né à Toronto en 1918. Il a obtenu son B.A. à l'Université de Toronto en 1939 et a passé l'année suivante à Princeton grâce à une bouse de l'Université de Toronto. Il a obtenu son doctorat de l'Université de Toronto en 1943 et a fait ses premières armes en enseignement à l'Université Queen's de 1943 à 1945. De 1945 à 1949, il a travaillé à la Fédération universelle des associations chrétiennes d'étudiants à Genève, et, en 1949, il a accepté un poste à l'Université de Toronto. En 1960, il est devenu directeur de département à l'Université Queen's. Il a été président de la SMC de 1973 à 1975.

Nathan Mendelsohn est né à Brooklyn (New York) en 1917. Il a fait toutes ses études à l'Université de Toronto (B.A. en 1939, Ph.D. en 1943). Il a entrepris sa carrière de professeur à l'Université Queen's en 1945 et il est passé à l'Université du Manitoba en 1947. En 1981, il est devenu le premier professeur émérite de cette université. Il a été président de la SMC de 1969 à 1971.

Irving Kaplansky est né à Toronto en 1917. Après avoir obtenu son B.A. et sa M.A. à Toronto, il a fait son doctorat à Harvard et a décroché son diplôme en 1942. De 1945 à 1984, il a enseigné à l'Université de Chicago. En 1984, il est devenu le deuxième directeur du MSRI à Berkeley.

ABEL PRIZE FOR 2003

The Norwegian Academy of Science and Letters has decided to award the Abel Prize for 2003 to **Jean-Pierre Serre**, Collège de France, Paris, France, "*for playing a key role in shaping the modern form of many parts of mathematics, including topology, algebraic geometry and number theory*".

The first Abel Prize has been awarded to Jean-Pierre Serre, one of the great mathematicians of our time. Serre is an Emeritus Professor at the Collège de France in Paris. He has made profound contributions to the progress of mathematics for over half a century, and continues to do so. Serre's work is of extraordinary breadth, depth and influence. He has played a key role in shaping the modern form of many parts of mathematics, including:

- Topology, which treats the question: what remains the same in geometry even when the length is distorted?
- Algebraic geometry, which treats the question: what is the geometry of solutions of polynomial equations?
- Number theory, the study of basic properties of numbers. For example prime numbers and the solution of polynomial equations as in Fermat's Last Theorem.

Serre developed revolutionary algebraic methods for studying topology, and in particular studied the transformations between spheres of higher dimensions. He is responsible for a spectacular clarification of the work of the Italian algebraic geometers by introducing and developing the right algebraic machinery for determining when their geometric construction worked. This powerful technique of Serre, with its new language and viewpoint, ushered in a golden age for algebraic geometry.

For the past four decades Serre's magnificent work and vision of number theory have been instrumental in bringing that subject to its current glory. This work connects and extends in many ways the mathematical ideas introduced by Abel, in particular his proof of the impossibility of solving the 5th degree equation by radicals, and his analytic techniques for the study of polynomial equations in two variables. Serre's research has been vital in setting the stage for many of the most celebrated recent breakthroughs, including the proof by Wiles of Fermat's Last Theorem.

Although Serre's effort has been directed to more conceptual mathematics, his contributions have connection to important applications. The practical issues of finding efficient error-correcting codes and of public-key cryptography, both make use of solutions of polynomial equations (specifically over finite fields) and Serre's work has substantially deepened our understanding of this topic.

Jean-Pierre Serre was born in 1926 in Bages, France. He studied at the École Normale Supérieure and received his D.Sc. in 1951 from the Sorbonne in Paris. After holding a position through the Centre National de la Recherche Scientifique, he was an associate professor at the Université de Nancy. In 1956 he assumed the position of professor at the Collège de France.

Serre has been made a Commander Légion d'Honneur and High Officer Ordre National du Mérite. He has been elected to many national academies, in particular, the academies of France, Sweden, United States and the Netherlands. He was awarded the Fields Medal in 1954 (the youngest recipient ever), the Prix Gaston Julia in 1970, the Balzan Prize in 1985, the Steele Prize in 1995 and the Wolf Prize in 2000. He has been awarded honorary degrees from many universities, most recently from the University of Oslo in 2002 in connection with the Abel Bicentennial.

ÉDITORIAL

S. Swaminathan

Howard Eves (*Mathematical Circles Revisited*) raconte dans son livre un épisode où il enseignait le principe du raisonnement par récurrence à des étudiants de première année à l'Université de Puget Sound. Il demande à ses étudiants de s'imaginer à l'extérieur d'une pièce où se trouve une rangée de livres sur une étagère. La particularité de cette rangée de livres : si un livre est rouge, celui qui le suit est rouge aussi. Un étudiant regarde par la porte entrouverte et constate que le huitième livre est rouge. Quelle conclusion, demande Howard Eves à ses étudiants, peut-on tirer de cela? Verner Hoggatt Jr, qui assistait à ce cours – et qui est devenu par la suite un spécialiste de Fibonacci et des suites associées, lui demande alors : « *Are they all good books?* » « *Alright, let us assume they are all good books* », répond le professeur. « *Then, all the books on the shelf are red* » réplique l'étudiant, Un peu ébranlé, le professeur demande à l'étudiant d'expliquer sa réponse. « *Because, you see, all good books are* READ », répond celui-ci.

Ce qui m'amène à poser la question suivante : « Quels critères essentiels établissent la « permanence » d'un ouvrage de mathématiques? » De nos jours, grâce à la facilité de préparation des manuscrits TEX, aux épreuves, au courriel et à la publication sur le Web, les livres et les articles scientifiques émanent des esprits fertiles des mathématiciens tels la multitude de graines produites par une seule plante ou de feuilles qui naissent aux branches des arbres au printemps, et leur durée de vie est presque aussi brève. Ni la popularité ni la réputation d'un auteur ne garantissent la pérennité d'un livre ou d'un article. Les ouvrages fondamentaux, comme les Éléments d'Euclide ou *Foundations of Algebraic Geometry*, d'André Weil, jouissent toutefois d'une permanence naturelle. La loi de la survie du plus fort, aujourd'hui généralement acceptée, s'applique probablement ici. Mais que veut dire « plus fort » quand on parle de la survie d'un livre? Au nombre des critères suggérés, l'originalité est sans doute le plus important. Mais ce ne sont pourtant pas tous les livres originaux qui survivent.

De plus, les manuels d'introduction sont bien souvent délibérément réédités au bout de quelques années pour contrer le marché des livres d'occasion. Même les manuels avancés, qui ne font pas l'objet d'une telle machination, font face à un double problème : c'est soit leur contenu mathématique, soit leur style pédagogique qui vieillit. Ainsi, leur durée de vie est très limitée.

Il y a bien sûr des classiques comme *Survey of Modern Algebra* de Birkhoff-MacLane, qui est populaire malgré la parution d'une version modernisée. Ou encore un ouvrage mentionné par G. C. Rota, Schaum's Outlines (dans *Indiscrete Thoughts*), qui ont été réimprimés pendant un demi-siècle. Paul Halmos a décrit dans son auto autobiographie (*I Want to be a Mathematician*) comment Dover Publications a commencé, pendant les périodes de vache maigre de la Seconde Guerre mondiale, à réimprimer des ouvrages classiques de mathématiques. C'est grâce à eux si nous avons aujourd'hui des réimpressions d'œuvres comme *Ramanujan* de G. H. Hardy.

Votre opinion ou vos commentaires sur le sujet sont les bienvenus. Écrivez-nous!

CONGRATULATIONS
FÉLICITATIONS

The CMS would like to congratulate and thank the following Members for over 50 years of membership.

La SMC aimerait féliciter et remercier les Membres suivants pour plus de 50 années d'abonnement.

Since 1948

M.S. (Jack) Macphail

Joachim (Jim) Lambek

Kenneth Ghent

A. John Coleman

Benjamin Moyls

Since 1949

Garth Thomas

Norman Lane

William Moser

Since 1952

Samuel Melamed

Since 1953

P.G. (Tim) Rooney

Helen Cullen

Lincoln Durst

2003 ENDOWMENT GRANTS COMPETITION

CALL FOR PROPOSALS

The Canadian Mathematical Society is pleased to announce a new grants competition to fund projects that contribute to the broader good of the mathematical community. The Endowment Fund will be used to fund such projects and the Endowment Grants Committee (EGC) will administer the distribution of the grants and will adjudicate proposals for projects. Depending on the performance of the CMS Endowment Fund, the funds available for this year's competition may be less than past years.

Proposals must address the goal and statement of purpose of the Canadian Mathematical Society:

The goal of the Canadian Mathematical Society is to support the promotion and advancement of the discovery, learning, and application of mathematics. The CMS Statement of Purpose is:

1. To unify and support Canadian mathematicians through effective communication, broad membership, sponsorship of diverse activities, and partnerships with like professional societies.
2. To support mathematics research through the communication of current research to both the specialist and non-specialist, public recognition of research accomplishments and collaboration with the research institutes and granting agencies.
3. To support the advancement of mathematics education through joint projects with mathematics educators at all levels, promotion of educational advancements, and partnerships with provincial ministries of education and organizations supporting mathematics education.
4. To champion mathematics through initiatives that explain, promote and increase the general understanding of mathematics, provide extra-curricula opportunities for students, and encourage partnerships with corporate, government and not-for-profit agencies.

An applicant may be involved in only one proposal per competition as a principal applicant. Proposals must come from CMS members, or, if joint, at least one principal applicant must be a CMS member.

The EGC will consider funding proposals for a maximum of three years. However, multi-year proposals must be funded from the funds available to the EGC in the year of application. The EGC will consider funding proposals to a maximum of $5,000 per year.

The EGC committee intends to favour proposals where CMS funds can be leveraged or where proposals have no other natural funding body to which to apply.

If it is anticipated that a proposal will generate something of lasting financial value, proposers must indicate that this is the case and declare their intent with respect to that value. An application form, advice and directions are available at the CMS website *www.cms.math.ca/Grants/*.

We prefer to have an applicant fill out the application on an HTML form and submit it electronically. We will accept a hard copy as an e-mail attachment using either the Microsoft Word template or the LATEX template available for downloading from the CMS web site given above. Send the proposal as an attachment to the e-mail address *chair-egc@cms.math.ca.* We will also accept a proposal in these templates sent as hard copy to the CMS Executive Office. If you have any immediate questions on the program or the application process please e-mail the Chair of the EGC, at *chair-egc@cms.math.ca*. If you plan on applying, the committee would find it extremely useful if you sent the Chair an e-mail expressing your interest as soon as possible.

Proposals must be received at the CMS Executive Office or electronically by the EGC committee no later than September 30, 2003.

Proposals should be sent to the following address:

2003 CMS Endowment Grants Competition
Canadian Mathematical Society
577 King Edward, Suite 109 P.O. Box 450, Station A
Ottawa, Ontario K1N 6N5

Again, the relevant electronic addresses are:

www.cms.math.ca/Grants/ for directions, forms, advice and electronic form submission

chair-egc@cms.math.ca. for e-mail contact with the Chair of the EGC and for submission of a proposal as an attached file to an e-mail.

CONCOURS DE BOURSES DU FONDS DE DOTATION 2003

APPEL DE PROPOSITIONS

La Société mathématique du Canada (SMC) est heureuse d'annoncer la tenue d'un nouveau concours de bourses pour le financement d'activités qui contribuent à l'essor global de la communauté mathématique. Le Comité d'attribution des bourses du fonds de dotation (CABFD) se chargera d'évaluer les propositions et d'attribuer les bourses. Selon le rendement du Fonds de dotation de la SMC, le financement disponible pour le concours de cette année pourrait être inférieur à celui des années précédentes.

Les propositions doivent être conformes à l'objectif et à l'énoncé d'intention de la SMC :

La Société mathématique du Canada s'est donnée pour objectif de promouvoir et de favoriser la découverte et l'apprentissage des mathématiques, et les applications qui en découlent. Son énoncé d'intention est le suivant :

1. Regrouper et appuyer les mathématiciens canadiens en favorisant la communication et l'adhésion à grande échelle, en commanditant diverses activités et en établissant des partenariats avec des associations professionnelles semblables à la nôtre.
2. Encourager la recherche mathématique en diffusant les résultats de recherches en cours aux spécialistes et aux non-spécialistes, en faisant reconnaître publiquement les travaux de chercheurs et en collaborant avec les instituts de recherche et les organismes subventionnaires.
3. Favoriser l'apprentissage des mathématiques en réalisant des projets avec des professeurs de mathématiques de tous les niveaux, en faisant connaître les progrès dans l'enseignement et en établissant des partenariats avec les ministères de l'éducation provinciaux et les organismes voués à l'apprentissage des mathématiques.
4. Défendre les mathématiques en créant des initiatives visant à expliquer, à promouvoir et à mieux faire connaître la discipline, en organisant des activités parascolaires et en encourageant les partenariats avec les sociétés privées, les gouvernements et les organismes à but non lucratif.

Un demandeur ne peut présenter qu'une proposition par concours en tant que demandeur principal. Les propositions doivent venir de membres de la SMC. S'il s'agit d'un projet conjoint, au moins un des demandeurs principaux doit être membre de la SMC.

Le CABFD évaluera les projets qui s'étalent sur un maximum de trois ans. Les projets s'échelonnant sur plusieurs années seront toutefois financés en fonction des fonds dont disposera le Comité l'année de la demande. Le Comité se limitera aux propositions dont le financement demandé n'excède pas 5 000 $ par année.

Le CABFD désire privilégier les propositions où les fonds de la SMC peuvent être équilibrés ou les propositions qui ne disposent d'aucun organisme de financement naturel où postuler.

Si les demandeurs prévoient tirer une valeur financière durable du projet, ils doivent l'indiquer et expliquer ce qu'ils ont l'intention d'en faire. Le formulaire de demande, les instructions pertinentes et des conseils est disponible au site de la SMC *www.smc.math.ca/Grants/*. Ainsi, les proposants auront tout le temps voulu pour vendre leurs idées au CABFD.

Nous espérons qu'il sera possible de remplir la demande en format HTML et de la soumettre électroniquement mais sinon, nous accepterons les fichiers annexés à un message de courriel réalisés à l'aide des documents types de format Microsoft Word ou LaTeX téléchargeables à partir du site Web de la SMC, à l'adresse suivante : *presegc@smc.math.ca.* Nous accepterons aussi les copies imprimées de ces documents types au bureau administratif de la SMC. Pour toute question sur le programme ou sur le processus de demande, prière d'envoyer un message par courriel à la présidente du CABFD, à l'adresse suivante : *presegc@smc.math.ca*. Si vous prévoyez faire une demande, le Comité vous saurait gré de lui faire part de votre intérêt le plus tôt possible en faisant parvenir un message par courriel à sa présidente.

Les propositions doivent parvenir au bureau administratif de la SMC au plus tard le 30 septembre 2003.

Envoyer les propositions à l'adresse suivante :

Concours de bourses du fonds de dotation 2003
Société mathématique du Canada
577, avenue King-Edward, bureau 109 C. P. 450,
succursale A
Ottawa (Ontario) K1N 6N5

Rappel - liste des adresses pertinentes :

www.smc.math.ca/Grants : instructions, formulaires, conseils, envoi du formulaire électronique;

pres-egc@smc.math.ca. : pour communiquer avec le président du CABFD et envoyer vos demandes en annexe à un message de courriel.

THE UNIVERSITY OF WESTERN ONTARIO

Department of Mathematics

Applications are invited for a Professor (tenured) or Assistant/Associate Professor (Probationary/tenure track) position to be held in conjunction with an Associate Member position at the Perimeter Institute for Theoretical Physics. The rank and salary of the position will be dependent upon qualifications and experience.

The successful candidate will have an outstanding record of research and publication in quantum gravity, and will be expected to maintain an ongoing vigorous research program. The candidate's research interests should have considerable overlap with existing areas of research strength at both the Perimeter Institute and the Department of Mathematics at The University of Western Ontario; the position will entail active collaboration with mathematicians and theoretical physicists at both institutions. An important goal for this position is to further integrate the research activities of Perimeter Institute and The University of Western Ontario and it is therefore paramount that the candidate fit well with culture of both organizations.

The candidate will also have a commitment to and demonstrated aptitude for teaching, and will be expected to teach at the undergraduate and graduate levels and to supervise graduate theses.

Those interested in applying for this position should forward a curriculum vitae and have at least three letters of reference sent to:

Professor J. F. Jardine, Chair
Department of Mathematics
The University of Western Ontario
London, Ontario N6A 5B7 Canada

We also welcome email inquiries and submissions, to be sent to the address: math-pos@uwo.ca

Our web address is: *http://www.math.uwo.ca*. Perimeter Institute's website is *http://www.perimeterinstitute.ca/*

Application materials should arrive no later than June 2, 2003. The appointment is scheduled to begin on January 1, 2004.

Position is subject to budget approval. All qualified candidates are encouraged to apply; however Canadians and permanent residents will be given priority. The University of Western Ontario is committed to employment equity and welcomes applications from all qualified women and men, including visible minorities, aboriginal people and persons with disabilities.

CALENDAR OF EVENTS / CALENDRIER DES ÉVÉNEMENTS

MAY 2003 MAI

2 - 3 The ninth Great Lakes K-theory Conference (Fields Institute, Toronto, ON)
http://www.math.uwo.ca/GL9.htm

5 - 9 Theorie des Nombres et Applications
(Université Hassan II of Casablanca
and Université de Marrakech, Morroco)
elmorchid@yahoo.fr, cl@mat.ulaval.ca

11 - 16 International Conference on General Control Problems and Applications (GCP2003) : Dedicated to the 100th anniversary of A. N. Kolmogorov
(Tambov Sate University, Tambov, Russia)
www.opu2003.narod.ru/

14 - 18 Complex Systems and Computer Science in Sport
(Barcelona)
Natàlia Balagué: www-ma1.upc.es/comcom/

16 - 18 Canadian School Mathematics Forum 2003 / Forum canadien sur l'enseignement des mathématiques 2003
(Montréal, Québec)
www.cms.math.ca/Events/CSMF2003/
www.smc.math.ca/Reunions/FCEM2003/

17 - 22 Sixth Graduate Math Modelling Camp
(BIRS, Banff)
www.pims.math.ca/industrial/2003 /gimmc.

21 - 23 31st Canadian Annual Symposium on Operator Algebras and Operator Theory
(UNB, Fredericton)
www.math.unb.ca/~coas2003

24 - 30 Conference in Number Theory in Honour of Professor H.C. William
(Banff, Alberta)
www.fields.utoronto.ca/programs/scientific/02-03/numtheory/

24 - 29 Seventh Industrial Problem Solving Workshop
(University of Calgary)
www.pims.math.ca/industrial/2003/ipsw

30 - June 1 Groups and Semigroups in Analysis, Conference in honor of J.S. Pym
(University of Sheffield, U.K.)
www.math.uwo.ca/~milnes/JSMay03.htm

30 - June 1 Annual Meeting of the Canadian Society for History and Philosophy of Mathematics; Special Session: Maritime Mathematics
(Dalhousie University, Halifax)
www.cshpm.org ; baltus@oswego.edu

JUNE 2003 JUIN

2 - 20 Logical Foundations of Computer Science, Fields Institute Summer Programme
(University of Ottawa, Ottawa, ON)
http://www.mathstat.uottawa.ca/lfc/fields2003/

8 - 15 41st International Symposium on Functional Equations
(Noszvaj, Hungary)
pales@math.klte.hu ; http://riesz.math.klte.hu/~isfe

12 - 13 Connecting Women in Mathematics Accross Canada
(University of Alberta, Edmonton AB)
http://www.cms.math.ca/bulletins/2003/cwinac03.e

14 - 16 CMS Summer Meeting / Réunion d'été de la SMC (University of Alberta, Edmonton, Alberta)
www.cms.math.ca/Events/ ; www.smc.math.ca/Reunions/

14 -19 Integration on Arc Spaces, Elliptic Genus and Chiral de Rham Complex (Banff International Research Station, Banff, AB)
http://www.pims.math.ca/birs/

16 - 20 SIAM/CIAM Joint Annual Meeting
(Queen Elizabeth Hotel, Montreal, Quebec)
meetings@siam.org

17 - 21 Fourth Butler Memorial Conference
(University of Alberta, Edmonton, Alberta, Canada)
http://conley.math.ualberta.ca/butler.html

18 - 21 First Joint Meeting between AMS and Real Sociedad Matematica Espanola – (Seville, Spain)
www.us.es/rsme/-ams/

21-26 Point Processes - Theory and Application (Banff International Research Station, Banff, AB)
http://www.pims.math.ca/birs/

23 - 25 SIAM Conference on Mathematics for Industry: Challenges and Frontiers
(The Metropolitan Hotel, Toronto, ON)
meetings@siam.org

25-30 International Workshop on Small Sets in Analysis
(Center for Math. Sciences, Technion IIT, Haifa, Israel)
cms@math.technion.ac.il

29 - July 3 Conference in honour of Alexander Arhangelskii
(Brooklyn College of CUNY, Brooklyn,NY)
www.sci.brooklyn.cuny.edu/~raushan/Conference/

JULY 2003 JUILLET

1 - 10 Advanced Course on Polynomial Identity Rings
(Bellaterra, Barcelona, Spain)
Ferran Cedó: www.crm.es/Pl-rings

5 - 10 Mathematical Biology (Banff International Research Station, Banff, AB)
http://www.pims.math.ca/birs/

7 - 11 Fifth International Congress in Industrial and Applied Mathematics
(Sydney, Australia)
www.iciam.org

7 - 18 Structural Theory of Automata, Semigroups, and Universal Algebra Conference
(Université de Montréal)
www.dms.umontreal.ca/sms

7 - 19 44th International Mathematical Olympiad / 44e Olympiade internationale mathématique
(Tokyo, Japan)
http://olympiads.win.tue.nl/imo/

19 - 24 Differential Invariants and Invariant Differential Equations (Banff International Research Station, Banff, AB)
http://www.pims.math.ca/birs/

20 - 26 Hodge Theory in a New Century: A Euro Conference celebrating the centenary of Sir William Hodge (International Center for Math. Science, Edinburgh, UK)
http://www.ma.hw.ac.uk/icms/meetings/2003/HODGE/

21 - August 15 Second Annual AARMS Summer School for Graduate Students
(St. John's, Newfoundland)
www.math.mun.ca/ aarms/summerschools

26 - 31 Analysis and Geometric Measure Theory (Banff International Research Station, Banff, AB)
http://www.pims.math.ca/birs/

27 - August 9 Banach algebras and their applications
(University of Alberta, Edmonton, AB)
www.math.ualberta.ca/ ba03/

AUGUST 2003 AOÛT

4 - 9 International Algebraic Conference
(Lviv, Ukraine)
topos@franko.lviv.ua

5 - 8 12th International Workshop on Matrices and Statistics (IWMS 2003)
(Dortmund, Germany)
www.statistik.uni-dortmund.de/IWMS/main.htm

9 - 16 Localization Behaviorin Reaction-Diffusion Systems and Applications to the Natural Sciences (Banff International Research Station, Banff, AB)
http://www.pims.math.ca/birs/

11 - 13 15th Canadian Conference on Computational Geometry
(Dalhousie University, Halifax, NS)

16- 21 Current Trends in Arithmetic Geometry and Number Theory (Banff International Research Station, Banff, AB)
http://www.pims.math.ca/birs/

17 - 20 AARMS Workshop on Financial mathematics
(Memorial University, St. John's, NF)
http://math.mun.ca/aarms — edgar@math.mun.ca

30 - September 4 Locally Finite Lie Algebras (Banff International Research Station, Banff, AB)
http://www.pims.math.ca/birs/

SEPTEMBER 2003 SEPTEMBRE

2 - 6 Barcelona Conference on Asymptotic Statistics
(Bellaterra, Barcelona, Spain)
Vladimir Zaiats: www.crm.es/bas2003

16 - 20 Barcelona Conference on Set Theory, Bellaterra
(Barcelona, Spain)
Joan Bagaria: www.crm.es/set-theory

30 - October 7 Mathematics in Armenia - advances and perspectives (Institute of Mathematics of NAS of Armenia, Yerevan, Armenia)
http://math.sci.am/conf.htm

OCTOBER 2003 OCTOBRE

20-24 IMA Workshop 2: Comparative Genomics
(University of Minnesota, Minneapolis, MN)
http://www.ima.umn.edu/complex/fall/c2.htm

DECEMBER 2003 DÉCEMBRE

6 - 8 CMS Winter Meeting / Réunion d'hiver de la SMC
Simon Fraser University
(Harbour Centre, Vancouver, British Columbia)
Monique Bouchard: meetings@cms.math.ca

15 - 19 28th Australasian Conference on Combinatorial Mathematics and Combinatorial Computing
(Melbourne, Australia)
www.cm.deakin.edu.au/comb2003melbourne

JANUARY 2004 JANVIER

21 - 30 Advanced Course on Ramsey Methods in Analysis
(Bellaterra, Barcelona, Spain)
Joan Bagaria: www.crm.es/RamseyMethods

FEBRUARY 2004 FÉVRIER

2 - 13 Advanced Course on Contemporary Cryptology
(Bellaterra, Barcelona, Spain)
Paz Morillo: www.crm.es/ContemporaryCryptology

JUNE 2004 JUIN

Mathematical Foundations of Learning Theory
(Barcelona, Spain)
Gábor Lugosi: www.crm.es/MathematicalFoundations

13 - 15 CMS Summer Meeting / Réunion d'été de la SMC (Dalhousie University, Halifax, Nova Scotia)
Monique *Bouchard: meetings@cms.math.ca*

27 - July 2 European Congress of Mathematics
(Stockholm, Sweden)
Ari Laptev: laptev@math.kth.se

JULY 2004 JUILLET

4 - 11 The 10th International Congress on Mathematical Education
(Copenhagen, Denmark) *www.ICME-10.dk*

5 - 16 Advanced Course on Automata Groups
(Bellaterra, Barcelona, Spain)
Warren Dicks: www.crm.es/AutomataGroups

12 - 15 First Joint Canada-France meeting of the mathematical sciences / Premier congrès Canada-France des sciences mathématiques, (Toulouse, France)
www.cms.math.ca/Events/Toulouse2004/
www.smc.math.ca/Reunions/Toulouse2004/

DECEMBER 2004 DÉCEMBRE

11 - 13 CMS Winter Meeting / Réunion d'hiver de la SMC, (McGill University, Montréal, Québec)
Monique Bouchard: meetings@cms.math.ca

The 2003 Membership

Notices have been mailed. Please renew your membership now. To renew electronically, please visit our website at *www.cms.math.ca*.

Adhésion à la SMC

Les avis d'adhésion 2003 ont été postés. Veuillez renouveller votre adhésion maintenant. Vous pouvez aussi renouveller au site web *www.smc.math.ca.*

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