



CMS NOTES de la SMC

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VICTORIA, BC
December 10 - 12

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MESSAGE FROM THE PRESIDENT

Dr. H.E.A. (Eddy) Campbell
Memorial University of Newfoundland



nificant risks for the Society, since each of our activities is supported by a significant proportion of the community who would, no doubt, be offended if we were to reduce our support for our activities.

Later on in this column I will write as usual about our most important scientific work, the Summer Meeting in Waterloo. First, however, I want to bring to the attention of all members the difficult financial situation of the Society and the actions the Executive and Board have taken to correct it.

Many members will know that our chief source of revenue is our publications. Subscribers from outside Canada pay in US dollars. There are many constraints involved in the situation which I will not go into here: it is sufficient to know that our hands are tied in many ways. The recent strength of our dollar versus the US dollar has meant that the CMS has been operating at a deficit of serious proportions. Many people expect the Canadian dollar to remain strong.

We have choices to make: we can seek cost-saving measures; we can reduce our activities and hence our expenses; or we can enhance our revenues. The second of these three options carries with it sig-

capacity. This initiative will be very important for the Society and I will be devoting much of my work as President to this effort. You will be hearing more about this initiative over the coming months.

The Summer Meeting in Waterloo was a terrific success with some 540 delegates participating in this joint meeting with the Canadian Society for the History and Philosophy of Mathematics. I believe this was the largest meeting in our history. The Plenary Speakers were [Len Berggren](#) (Simon Fraser University), [Keith Devlin](#) (Stanford University), [Dan Freed](#) (University of Texas at Austin), [Robert McCann](#) (University of Toronto), [Andrei Okounkov](#) (Princeton University), [Gilles Pisier](#) (Université Paris 6, Texas A&M University), and [Ken Ribet](#) (University of California at Berkeley). The Krieger-Nelson Prize Lecture was delivered by [Barbara Lee Keyfitz](#), the Director of the Fields Institute. The Jeffery-Williams Prize Lecture was delivered jointly by [Edward Bierstone](#) (University of Toronto) and [Pierre Milman](#) (University of Toronto). And the Excellence in Teaching Award was given to [Philip Loewen](#) (University of British Columbia).

There were 23 sessions across the breadth of mathematics and its history and

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GOOD IDEAS

Many years ago a research student who had not yet settled on a problem was idly thumbing through the pages of J. L. Kelley's *General Topology*. In the opening chapter on preliminaries his attention was drawn to the definition of a ring in which the distributive law was stated as

$(u + v) \cdot (x + y) = u \cdot x + v \cdot y + v \cdot x + v \cdot y$, for all u, v, x, y . He wondered whether this was equivalent to the two separate equations formulation usually given in algebra texts. By checking it out himself and also consulting others he discovered that the two formulations are not equivalent unless $a \cdot 0 = 0 = 0 \cdot a$ for all a . This led to his thesis problem on generalized distributive laws. Two morals of this story are that a simple oversight of an author can be beneficial in some way and that good ideas for research lurk in seemingly unlikely places.

Mathematicians are not immune to oversights and errors. When Andrew Wiles announced his proof of Fermat's Last Theorem, an argument described in his Cambridge lectures turned out to have a gap in the construction of an Euler system. Fortunately he was able to fix it by using a different approach concerning Hecke algebras, the necessary property of which was established in co-operation with R. Taylor.

It happens often that mathematician A discovers a theorem, B gives a partial proof or a proof in which a gap is found later, C proves it completely and D generalizes it. A famous example of this is the law of quadratic reciprocity in number theory. Euler and later Legendre independently discovered the law, Lagrange gave a proof which had serious gaps, Gauss rediscovered it and gave the first complete proof and subsequently six other proofs, and Emil Artin generalized it. In the course of his attempts to prove his discovery Legendre anticipated Dirichlet's famous theorem on primes in arithmetic progressions, which too he could not prove.

Good ideas do not always occur by chance.
Hard work gives rise to them.

Steven Krantz gives an example in his admirable book *Mathematical Apocrypha*. When Dennis Sullivan was asked how he could come up with the theory of rational homotopy he replied that he read Hassler Whitney's *Geometric Integration Theory* and really understood what he was talking about.

Necessity is the mother of invention. This dictum is another source of great ideas. The electromechanical calculator at the Bell Telephone Labs was a pioneering machine which could perform calculations and also detected errors. But it simply

stopped due to a mechanical or electric fault or, if the error was in a program of instructions, it switched to next program in the queue. This frustrating behaviour of the machine impelled Richard W. Hamming into developing a way for the computer to correct errors and proceed without human intervention. Ivars Peterson tells the full story of the genesis of Hamming Codes in his book *The Jungles of Randomness*.

If you have an interesting story of how you got a good idea for research we would like to hear it. Please write to us your views.

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Rédacteurs en chef

Robert J. MacG. Dawson
Srinivasa Swaminathan
notes-redacteurs@smc.math.ca

Rédacteurs-gérant

Graham P. Wright
gwright@smc.math.ca

RÉDACTION

Éducation : Edward Barbeau
notes-education@smc.math.ca

Critiques littéraires: Peter Fillmore
notes-redacteurs@smc.math.ca

Réunions : Gertrud Jeewanjee
reunions@smc.math.ca

Recherche : Vacant
notes-recherche@smc.math.ca

Assistante à la rédaction :
Nathalie Blanchard

Note aux auteurs: indiquer la section choisie pour votre article et le faire parvenir au Notes de la SMC à l'adresse postale ou de courriel ci-dessous.

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CONTRIBUTING EDITORS

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Editors-in-Chief

Robert J. MacG. Dawson;
Srinivasa Swaminathan
notes-editors@cms.math.ca

Managing Editor

Graham P. Wright
gwright@cms.math.ca

CONTRIBUTING EDITORS

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

Book Reviews: Peter Fillmore
notes-reviews@cms.math.ca

Meetings: Gertrud Jeewanjee
meetings@cms.math.ca

Research: Vacant
notes-research@cms.math.ca

Editorial Assistant:
Nathalie Blanchard

The Editors welcome articles, letters and announcements, which can be sent to the *CMS Notes* at the address below.

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Canadian Mathematical Society - Société mathématique du Canada

577 King Edward, Ottawa, Ontario, Canada K1N 6N5
T: (613) 562-5702 F: (613) 565-1539

notes-articles@smc.math.ca
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EDITORIAL

par S. Swaminathan
Université Dalhousie, Halifax, N.-É.

DE BONNES IDÉES

Il y a longtemps, un étudiant-chercheur qui n'avait pas encore arrêté son choix sur un problème feuilletait tranquillement *General Topology* de J. L. Kelley. Dans le premier chapitre, la définition suivante de la distributivité d'un anneau a attiré son attention :

$(u + v) \cdot (x + y) = u \cdot x + v \cdot y + v \cdot x + v \cdot y$, pour tous les u, v, x, y . Il s'est alors demandé si c'était là l'équivalent des deux équations distinctes généralement données dans les manuels d'algèbre. En vérifiant lui-même et auprès de collègues, il a découvert que les deux formulations n'étaient pas équivalentes à moins que $a \cdot 0 = 0 = 0 \cdot a$ pour tous les a . Cette constatation lui a fourni le sujet d'une thèse sur les lois distributives généralisées. On tirera deux morales de cette histoire : une simple omission d'un auteur a parfois des effets bénéfiques, et les bonnes idées de recherche se cachent parfois dans des endroits inusités.

Les mathématiciens ne sont pas à l'abri des omissions et des erreurs. Lorsqu'Andrew Wiles a annoncé qu'il avait prouvé le dernier théorème de Fermat, l'un des éléments de preuve qu'il avançait dans ses conférences à Cambridge a fait ressortir une faille dans la construction d'un système d'Euler. Heureusement, il a pu rectifier le tir à l'aide d'une approche différente se rapportant à l'algèbre de Hecke, dont il a établi la propriété en collaboration avec R. Taylor.

Il arrive souvent qu'un mathématicien A découvre un théorème; que B fournisse une preuve partielle ou une preuve dont on découvre une lacune plus tard; que C en établisse la preuve complète et que D le généralise. Le cas de la loi de la réciprocité quadratique en théorie des nombres est un exemple célèbre. Euler, et plus tard Legendre, ont découvert la loi chacun de leur côté; Lagrange a fourni une preuve contenant de graves lacunes; Gauss l'a remise au jour et en a donné la première preuve complète, ainsi que six autres preuves par la suite, et Emil Artin l'a généralisée. Pendant qu'il tentait de prouver ses découvertes, Legendre a devancé le célèbre

théorème de Dirichlet sur les entiers dans les progressions arithmétiques, qu'il n'arrivait pas à prouver non plus.

Mais les bonnes idées ne sont pas toujours le fruit du hasard; elles sont souvent le résultat d'un travail acharné. Steven Krantz en donne un exemple dans son œuvre admirable intitulée *Mathematical Apocrypha*. Lorsqu'on a demandé à Dennis Sullivan comment il avait réussi à élaborer la théorie de l'homotopie rationnelle, il a répondu qu'il avait lu et véritablement compris *Geometric Integration Theory* de Hassler Whitney.

La nécessité est mère de l'invention. Ce proverbe est une autre source de grandes idées. Le calculateur électromécanique des laboratoires de Bell Telephone était une machine pionnière qui pouvait effectuer des calculs et aussi détecter des erreurs. Mais elle s'arrêtait en cas de défaillance mécanique ou électrique. Et si l'erreur se trouvait dans le programme d'instructions, elle passait au programme suivant dans la liste. Ce comportement frustrant de la machine a incité Richard W. Hamming à trouver une façon par laquelle l'ordinateur pourrait corriger les erreurs et ainsi poursuivre ses calculs sans intervention humaine. Ivars Peterson raconte l'histoire intégrale de la genèse des codes de Hamming dans son livre *The Jungles of Randomness*.

Vous avez une bonne histoire à nous conter sur la façon dont vous est venue une idée de recherche, ou des commentaires à ce sujet ? Écrivez-nous!

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Date limite 30 septembre 2005 pour le trimestre d'hiver 2006

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Application details
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For additional information please see your department or call the CMS at 613-562-5702.

Deadline is September 30, 2005 to attend the Winter 2006 semester.

**Elementary Probability
with Applications**
by Larry Rabinowitz, A K Peters
2005, x + 196 pp.

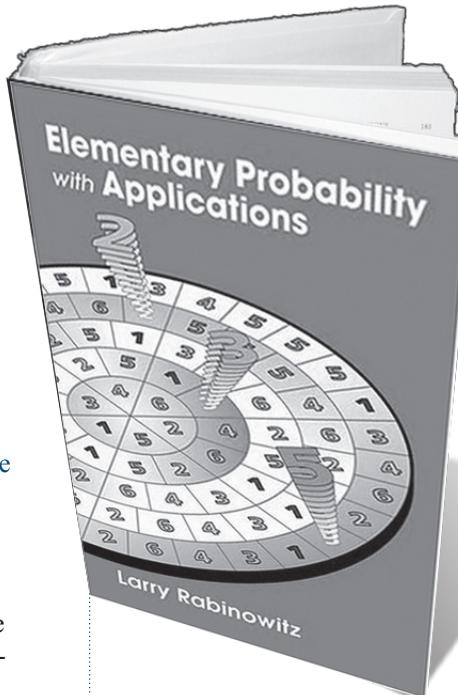
John Donne once wrote, apropos of platonic love affairs: “Whoever loves, if he do not propose/ The right true end of love, he’s one that goes/ To sea for nothing but to make him sick.” (Elegy XVIII). The same may be said of introductory courses in probability theory that do not lead to serious applications. While these could be in industrial quality control, actuarial studies, quantum mechanics, or cryptography, for most students the natural applications are to statistical inference.

There are two obvious reasons for using “real” questions in the study of probability. One, internal to the course, is the need to keep the interest of the students. Human nature being what it is, a question involving crime, sport, or scandal will probably keep students interested better than one that begins “Suppose that a certain random variable has the distribution...” The other reason is to teach an actual application of the theory that students will be able to use again later.

On the first count, this book does an excellent job. It is full of interesting questions dealing with popular culture, legal issues (discrimination, value of evidence), sports (chances of a sweep in the World Series, did “Magic” Johnson choke in Game 4 of the 1984 championships?) and “sex, drugs, and rock’n’roll” in general. Many of the problems are based on real-world events. This is an opportunity that writers of texts in many other areas don’t have, and that writers of probability texts don’t always take advantage of. This book does – and it is fun to read.

On the other hand, I cannot say that the attempts to introduce statistical inference and other useful applications are as successful. In all too many cases, what students are introduced to is just bad practice. For instance:

- A question on randomized-response sampling (Q15, p.83) involves a sample size of 300 with 55% of respondents asked to respond “true” or “false” to a statement (“I have had sex in an academic building”) while the other 45% are asked to respond to the negative statement (“I have never...”). We are told that 136 students respond “true” and asked to estimate the proportion of students who have done the deed. The correct point-estimate answer (1/30) is given. Unfortunately, what is not mentioned is that the standard error is so large that the data are compatible with almost any incidence of improper use of academic facilities. A 95% confidence interval for the proportion of the population who would have answered “true” runs from 40% to 51%. As this is $45\% \pm p/10$, where p is the proportion of students avoiding the residence beds, we see that p could very well be anywhere from 0% to 60%. Anybody designing a randomized-response



survey with this question as a model is unlikely to get a useful answer!

This loss-of-power issue is never taken up.

- The sections on hypothesis testing repeatedly use one-sided testing because “we are trying to establish” (p.171) a certain direction of alternative. In seven examples and fourteen prob-

lems, the students never see a two-sided alternative!

(One example and two problems use a point alternative, which is legitimate if artificial.)

While there are special circumstances in which a one-sided test is justified,

using such a test in ordinary inference is very bad practice, effectively deciding ahead of time to ignore any evidence against what you are trying to prove and pretending that this gives extra evidence for your favored hypothesis.

- At first glance, it appears that the author is advocating the rather old-fashioned practice of fixed-level significance testing. On closer inspection, what is actually being done is far stranger – significance levels are repeatedly being “chosen” to coincide with the (one-sided) p -values obtained! For instance, in example 7.4 (p.173), students are instructed to use a significance level of 0.063, which magically appears as the p -value. Students are told (p.174) that “It is common practice in actual studies to select a significance level near [sic] .05.”, but an α of 0.05 is only used in two examples (in one of which the computed p -value is 0.05) and one exercise. • Earlier in the book, in the section on cryptography, the “Index of Coincidence” for an enciphered message is introduced as a way to determine whether a substitution cipher has been used. This is the proportion of all $\binom{n}{2}$ pairs of symbols in an n -character message for which the two characters are the same; this would be about 0.038 for random choices from a 26-letter alphabet, about 0.066 for English text (in which some letters are more common than others) or text enciphered with a single transposition rule, and something intermediate if text is enciphered with a cyclic key. Thus, this index gives a way to determine which methods of codebreaking to try first.

Again, students are warned in passing (p. 80) that the IC gives a good estimate only when the message is long; but exercise 43 (p.90) ask the student to apply the method to a message of 9 letters, containing 2 pairs. As might be expected, with a sample size this small nothing useful can be said; →

Sets for Mathematics

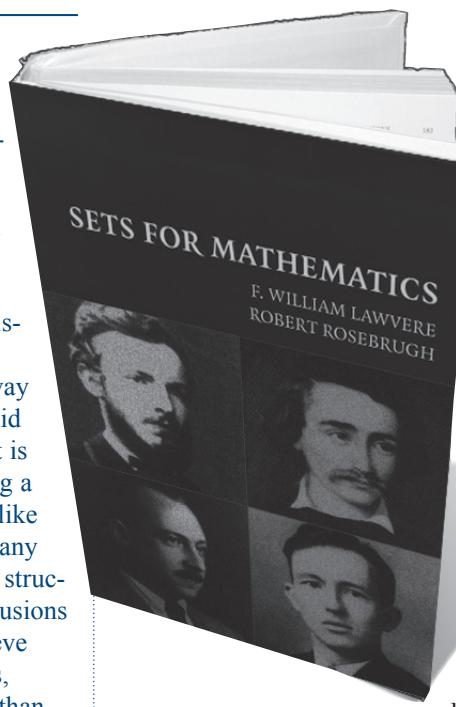
by F.W. Lawvere and R. Rosebrugh

Cambridge University Press, 2003, xiii + 276 pp.

When I was an undergraduate and beginning graduate student, it seemed like nearly every course began in much the same way. The instructor defined “set” (naively) and then explained what a {group | ring | topological space | topological group | ...} structure was and defined an admissible map as a function that preserved the structure. In the intervening years, I have taught courses that started that way too. I also once taught a course in set theory and when I did I discovered an interesting fact. A set also has structure; it is an e-tree. That is, it is a (well-founded) tree in which being a node of level one is the same as being an element. But unlike all those algebraic and topological examples, we never at any time discussed the notion of a function that respected that structure. There are, in fact, very few such functions (only inclusions of subsets) and they are of little or no interest. I now believe that those e-trees are just models of what we mean by sets, rather than the sets themselves which are specified rather than determined by the axioms. Thus the only purpose of this e-tree model of sets is to show that the specifications are consistent.

A similar example occurs with the definition of ordered pairs. We typically define the ordered pair (a,b) as $\{\{a\}, \{a,b\}\}$ (although other definitions are possible). In fact, the only thing we have to know about ordered pairs is that for any a and b , there is an ordered pair (a,b) and that $(a,b) = (c,d)$ if and only if $a = c$ and $b = d$. Similarly, the only thing we have to know about sets is that they satisfy the Zermelo-Frankel axioms, probably with choice.

As a third example, the natural number \mathbb{N} is characterized by being the free object for one nullary and one unary operation. Any such object will serve, regardless of its elements. Similarly \mathbb{Z} is the free (abelian) group of one element.



At this point one begins to feel that what matters is not the sets and their elements, but the undefined sets and the arrows they admit. The book under review is an attempt to carry out that program. More precisely, it presents the category of sets axiomatically as follows.

The category of sets is a finitely complete category with a subobject classifier and exponentials (so far, what is called an elementary topos) with 1 (the one element set) as a generator and satisfying the axiom of choice. One usually assumes an axiom of infinity (a natural numbers object).

To describe this non-circularly, a one element set is an object that is the target of exactly one map from each other object. Finite limits are described in terms of the well-known universal mapping properties of products and equalizers (in the presence of a one element set, pullbacks would suffice). A subobject classifier is an object Ω such that for an object E , there is a natural equivalence between maps $E \rightarrow \Omega$ and subobjects of E . This really means between those contravariant functors. Exponentials E^D are objects for which there is a natural equivalence between maps $C \rightarrow E^D$ and maps $C \times D \rightarrow E$. All this has to be described functorially. The assumption that 1 is a generator means that given two (distinct) maps $f, g : A \rightarrow B$, there is a map $h : 1 \rightarrow A$ such that $f \circ h \neq g \circ h$. The axiom of choice is simply that every epimorphism split and the axiom of infinity is stated in terms of the existence of an object that admits recursive definitions of maps.

BOOK REVIEWS *continued*

Elementary Probability with Applications

it may be shown that the observed value is very compatible both with English text and with random characters.

Overall, then, this book's basic intent to use real applications to motivate the sometimes-dry and often-artificial study of probability theory is laudable. It is a pity that the book

falls so far short of this goal. While it would be an excellent source of examples and problems for an instructor experienced enough to avoid the pitfalls, I cannot recommend it as a textbook. A second edition of this book with these problems addressed, however, could be valuable indeed.

NEW AND NOTEWORTHY FROM CAMBRIDGE

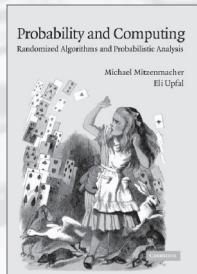
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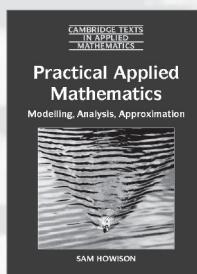
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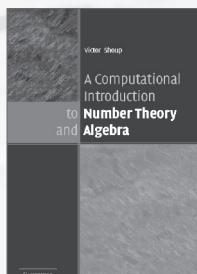


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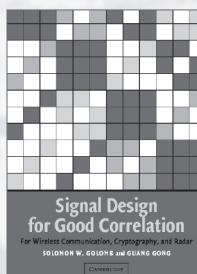
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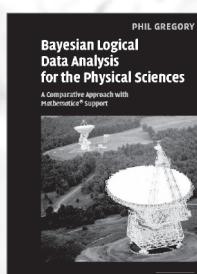


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BRIEF BOOK REVIEWS

by S. Swaminathan
Dalhousie University, Halifax, NS

Introductory Algebraic Number Theory

by *Saban Alaca and Kenneth S. Williams*
Cambridge University Press, 2004, xviii + 428 pp.

The subject of algebraic number theory arose from the sophisticated methods used during the middle of the nineteenth century to prove Fermat's Last Theorem. Attempts were made to consider a linear factorization of $x^n + y^n$ using complex numbers and then use the techniques of Leonard Euler's and Sophie Germain's to push through a general proof by infinite descent. The arguments involved were based on the assumption that if a product of relatively prime numbers is an n^{th} power itself, then each of the factors is also an n^{th} power. The proof of this requires unique factorization into primes, which is true for integers by the Fundamental Theorem of Arithmetic, but not for the more general class of complex numbers. Ernst Kummer began a program to understand the failure of unique factorization. His ideas led to the concepts of ideals in rings and ideal class numbers (in modern terminology) and thus laid the foundations of algebraic number theory.

The authors of this book present a detailed self-contained development of the classical theory of algebraic numbers. The first three chapters are devoted to introducing integral, Euclidean and Noetherian domains. Algebraic numbers and integers, and algebraic fields and their extensions, are introduced in Chapters 4, 5 and 6. Chapters 7 and 8 are concerned with integral bases and Dedekind domains. Factorization of ideals and the structure of the unit group of a real quadratic field form the subject matter of Chapters 9, 10 and 11. Chapter 12 deals with ideal class group and Minkowski's theorems in geometry of numbers. Dirichlet's determination of the units in an algebraic number field is presented in Chapter 13. Chapter 14, a short final chapter, gives applications to Diophantine equations.

Each chapter ends with a set of exercises, annotated bibliography and biographical references. Copious examples are given to illustrate the text material; this feature enhances the value of the book to beginners. The prerequisites for this book are just basic courses in linear algebra, modern algebra and elementary number theory. Galois theory is not required.

Computers, Rigidity and Moduli, The Large-Scale Fractal Geometry of Riemannian Moduli Space

by *Shmuel Weinberger*
Princeton University Press, 2005, xv + 174 pp.

This book is a record of the M. B. Porter Lectures given by the author in 2000 at Rice University. The main theme is the application of the theory of computation to problems in geometry. The author's interest is not simply in showing the algorithmic unsolvability of natural questions, but rather in solving geometric existence problems. A second aim is to gain insight into the geometry of various moduli spaces, most notably "Riemannian moduli space", i.e.,

the space of isometry classes of Riemannian metrics on a given smooth compact manifold with curvature bounds.

In the preface the author explains the title of the book, as follows: “‘Computers’ here refers to the idealization of the digital computer, the Turing machine. Its theory will be applied to the study of the geometry of certain smooth moduli spaces and to the existence of solutions to variational problems. Now where is the rigidity? On the one hand, of course, the very flexibility of the moduli spaces that we establish can be viewed as the opposite of too narrow a view of the rigidity phenomena. More significantly, in the study of arbitrary manifolds, ‘eastern philosophy’ requires ideas and methods that are the cornerstones of geometric rigidity (such as the theory of simplicial norms and results about hyperbolic and arithmetic groups) and topological rigidity (notably, results about versions of the Novikov and Borel conjectures, that are still known only under quite geometric hypotheses at this time).”

After an Introduction and Overview, there are four chapters with the following headings: Group Theory, Designer Homology Spheres, The Roles of Entropy, and The Large-Scale Fractal Geometry of Riemannian Moduli Space. Each part ends with a section called ‘Notes’ which includes credits, historical remarks and annotated references.

Combinatorics of Permutations

by *Miklós Bóna*
Chapman & Hall/CRC, 2004, xii + 383 pp.

Permutations have a rich combinatorial structure. A permutation of a finite set can be represented as a word (sequence), a function, a collection of disjoint cycles, a matrix, etc. Each of these representations suggests a host of natural invariants, operations, transformations, structures etc, that can be applied to, or placed on, permutations. In this book the author provides a comprehensive, up-to-date treatment of both enumerative and extremal combinatorics and looks at permutations as both linear orders and as elements of the symmetric group.

Chapters 1 and 2 are devoted to permutations as linear orders. Descents, runs and inversions are defined and studied. Chapter 3 contains an exposition of permutations as products of cycles; besides the classical topics some less well known topics are also discussed. Chapters 4 and 5 are on pattern avoidance. [Pattern avoidance is a generalization of the notion of inversion of a pair of entries to k -tuples of entries. Consider a ‘long’ permutation such as $p = 25641387$, and a shorter one, say, $q = 132$. We then say that the 3-tuple (2,6,4) in p forms a pattern or subsequence of type 132 because the entries of (2,6,4) relate to each other as the entries (1,3,2) of q . On the other hand there is no pattern of type 12345 in p , so we say that p avoids 12345.] These chapters give a systematic treatment of this fascinating and active area of research. Chapter 7 gives an introductory account of algebraic combinations of permutations. The last chapter, Chapter 8, is about combinatorial sorting algorithms, many of which are quite recent.

BRIEF BOOK REVIEWS *continued*

Besides the exercises, each chapter ends with a collection of Problems Plus, which are more difficult than the exercises. Solutions are given for odd numbered exercises and for Problems Plus.

The book can be used as a graduate-level text and as a reference for combinatorics researchers.

Analysis of Heat Equations on Domains

by El Maati Ouhabaz

London Mathematical Society Monograph Series, Vol. 31
Princeton University Press, 2005, xiii + 284 pp.

Aiming at a systematic study of the L^p theory of evolution equations associated with non self-adjoint uniformly elliptic

operators, the author presents in this book recent developments and applications of Gaussian upper bounds to spectral theory. Providing the necessary background to understand the properties of heat equations, he treats properties of solutions to a wide class of heat equations. The book is intended for researchers and graduate students interested in sesquilinear form technique, semigroups generated by second-order elliptic operators in divergence form, heat kernel bounds, and their applications. Each chapter concludes with a section of notes containing references and supplementary information. A 17-page bibliography is given at the end of the book.

BRIEF BOOK REVIEWS

Fourier Analysis

by Eric Stade

Wiley-Interscience Pure and Applied Mathematics, 2005
xxiv + 488 pp.

Just about every undergraduate math student studies Fourier analysis at some point, whether in a course dedicated entirely to the topic or in a course on applied math, complex analysis, or differential equations. Physics and engineering students also get a solid exposure. There can be few other areas of mathematics that are, on the one hand, so breathtakingly elegant and on the other hand so fantastically useful.

Eric Stade has done a great job of writing a textbook that gets across both the beauty and the utility of this subject. The mathematics is dealt with clearly and with due recognition that students may enter a course in Fourier analysis from many different backgrounds; even fairly basic concepts are briefly reviewed. There are plenty of interesting historical asides, and connections with deep mathematics such as the Riemann ζ function are explored.

by Robert J. MacG. Dawson
Saint Mary's University, Halifax, NS

On the practical side, there are clear explanations for the nonspecialist of how Fourier analysis is used in chemistry, physics, geology, astronomy, crystallography, image analysis, and other applications. The FFT and wavelets are dealt with in enough depth to give the reader a real feel for these important techniques.

Finally, the reader cannot help but appreciate the sense of fun in the book. The index contains such references as "Jurassic Park" (in the context of deconvolution and seismic imaging), "Philip Glass" (whose music is cited as an example of a periodic phenomenon), and "zebra" (converted to a horse on pp 393-5 with a stripe-removing digital filter!)

There are, perhaps, a few more typographical errors than one would like to see; but this is a small flaw in an otherwise highly readable book, the philosophy of which is summarized by the following paragraph from the end of the introduction: "If we're going to fingerpaint, we're necessarily going to get our hands dirty. And there's no point trying to wash this stuff off: It's Fourier analysis, it's indelible. So ye who enter here, abandon all soap."

Rencontre Canada-Mexique

La Société mexicaine de mathématiques (*Sociedad Matemática Mexicana, SMM*) tiendra sa première séance en collaboration avec la SMC le 25 octobre 2005, dans le cadre de son congrès annuel de Mexico.

Au programme, une conférence plénière de Gordon Slade (UBC) intitulée « *Critical Oriented Percolation* » ainsi que des allocutions des conférenciers invités Thomas Salisbury (York/Fields, président élu de la SMC) et Alejandro Adem (directeur adjoint du PIMS). Des conférenciers mexicains seront également au programme.

Pour de plus amples renseignements, consultez le site officiel de la SMM au : www.smm.org.mx/SMMP/html/

Lors de cette rencontre, des représentants de la SMC aborderont la possibilité d'élargir la collaboration avec la SMM, en particulier la tenue d'un congrès organisé conjointement par les deux sociétés.

Graham Wright, Directeur administratif de la SMC

CMS Awards Announcement / Lauréats des Prix de la SMC

Prix Krieger-Nelson 2005 Krieger-Nelson Prize



Dr. Barbara Lee Keyfitz
University of Houston
& Fields Institute

The Krieger-Nelson Prize was inaugurated to recognize outstanding research by a female mathematician. The first prize was awarded in 1995.

Dr. Barbara Lee Keyfitz has made deep and original contributions in the field of nonlinear partial differential equations, with particular emphasis on hyperbolic systems of conservation laws and evolution equations that change type. Such systems arise in models for multiphase flow in porous media, and in two-phase compressible and incompressible flow.

Several times during her career, she had a pioneering role in tackling the most challenging problems in the field, and she opened up a new research direction when she developed a powerful new technique dealing with free boundary problems to further the understanding of transonic shocks.

Keyfitz studied also bifurcation problems in reaction-diffusion equations, especially in the theory of shock waves. She succeeded in adapting techniques from vector field dynamics to the problem of the admissibility of shock waves, a long-lasting question in applied mathematics.

With Suncica Canic and Eun Heui Kim, she is currently working on the analysis of self-similar solutions of systems of conservation laws in two space dimensions.

Professor Keyfitz graduated from the University of Toronto in 1966 and obtained her Ph.D. under Peter Lax at the Courant Institute in 1970. She held positions at Columbia University, Princeton University, and Arizona State University, and is currently the John and Rebecca Moores Professor at the University of Houston. She is a Fellow of the American Association for the Advancement of Science and has been and continues to be a member of the editorial boards of many mathematical journals.

Dr. Keyfitz has been a thesis advisor, postdoctoral advisor, and collaborator for a whole generation of mathematicians and continues to play an important role in promoting mathematics and helping young mathematicians worldwide. She has remained involved in Canadian mathematics, not only as a regular participant in conferences, but also supporting Canadian research as external reviewer for departments, as a member of the Scientific Advisory Panel at the Fields Institute, the NSERC Reallocation Committee, and the college of reviewers for the Canada Research Chairs program.

Le prix Krieger-Nelson rend hommage aux mathématiciennes qui se sont distinguées par l'excellence de leur contribution à la recherche mathématique. Le prix a été décerné pour la première fois en 1995.

Barbara Keyfitz a fait une contribution approfondie et originale dans le domaine des équations aux dérivées partielles non linéaires. Elle s'intéresse particulièrement aux systèmes hyperboliques de lois de conservation et aux équations d'évolution qui changent de type. De tels systèmes sont caractéristiques de modèles d'écoulement multiphasique en milieux poreux et d'écoulement biphasé compressible et incompressible.

À plusieurs reprises au cours de sa carrière, elle a été la première à s'attaquer aux problèmes les plus ardues du domaine. En proposant une nouvelle technique puissante liée aux problèmes aux limites libres pour approfondir la compréhension des chocs transsoniques, elle a ouvert la voie à une nouvelle orientation de recherche.

Barbara Keyfitz a également étudié les problèmes de bifurcation dans les équations de réaction-diffusion, notamment dans la théorie des ondes de choc. Elle a par exemple réussi à adapter des techniques de la dynamique des champs vectoriels au problème de l'admissibilité des ondes de choc, qui est un problème de longue date en mathématiques appliquées.

En ce moment, elle travaille en collaboration avec Suncica Canic et Eun Heui Kim à l'analyse de solutions autosimilaires de systèmes de lois de conservation dans des deux dimensions spatiales.

Barbara Keyfitz a obtenu son baccalauréat de l'Université de Toronto en 1966, et son doctorat, sous la direction de Peter Lax, à l'Institut Courant en 1970. Après avoir occupé des postes dans divers établissements (Columbia, Princeton et Arizona State), elle est en ce moment titulaire de la chaire d'enseignement John and Rebecca Moores à l'Université de Houston. Elle est membre de l'AAAS et continue de siéger au conseil de rédaction de nombreuses revues mathématiques.

Barbara Keyfitz a dirigé des thèses et des stages postdoctoraux d'une génération entière de mathématiciens, et a collaboré à des projets de toute sorte. Elle continue de jouer un rôle important dans la promotion des mathématiques et d'aider les jeunes mathématiciens de partout. Elle a toujours été active au sein de la communauté mathématique canadienne, non seulement par sa participation à des congrès, mais aussi par son appui à la recherche canadienne en tant que spécialiste externe, membre du comité consultatif scientifique de l'Institut Fields, membre du comité de réaffectation des fonds du CRSNG, ou membre du Collège d'examineurs du Programme des chaires de recherche du Canada.

RECIPIENTS LAURÉATS

2004 n/a

2003
Leah Keshet
British Columbia

2002
Priscilla Greenwood
British Columbia
and Arizona State

2001
Lisa Jeffrey - Toronto

2000
Kanta Gupta
Manitoba

1999
Nicole
Tomczak-
Jaegermann
Alberta

1998
Catherine Sulem
Toronto

1997
Cathleen Morawetz
New York

1996
Olga Kharlamovich
McGill

1995
Nancy Reid - Toronto

CMS Awards Announcement / Lauréats des Prix de la SMC

Prix Jeffery-Williams Prize - 2005

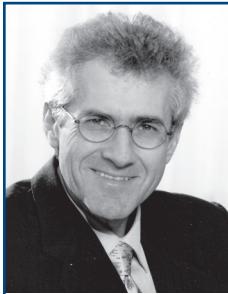
The Jeffery-Williams Prize recognizes mathematicians who have made outstanding contributions to mathematical research.

Dr. Edward Bierstone and Dr. Pierre Milman are honoured jointly for their highly significant work in the study of analytic and geometric properties of singular spaces.

Together, they found a simple proof of a canonical version of Hironaka's theorem on resolution of singularities, transforming that result from a monument to be admired to a tool to be used, bringing a new dimension of understanding and accessibility to the resolution process, at the same time extending it, and its applications, to a considerably wider range of spaces.

Recently, together with Wieslaw Pawlucki, they achieved a breakthrough on a classical problem of Whitney on extension of differentiable functions, leading to Fefferman's solution of the problem.

Professors Bierstone and Milman have made pioneering contributions to the geometry of sub-analytic sets, exploring their relationship to differentiable functions. Their results include solutions of long-standing problems on composite differentiable functions and on semi-coherent stratification. Their methods are expected to continue to reveal new and significant features of singular spaces.



Dr. Edward Bierstone
University of Toronto

Dr. Bierstone has been a member of the Institut des Hautes Études Scientifiques in Bures-sur-Yvette, France, a member of the Institute for Advanced Study in Princeton, and a visiting professor in Brazil and France. In 1992, he was elected Fellow of the Royal Society of Canada, in 1996 he won the Outstanding Teaching Award of the Faculty of Arts & Science at the University of Toronto, and in 2002 he was appointed a Fellow of the Fields Institute. He has also served as chair and member of NSERC Grant Selection Committee 336, Pure and Applied Mathematics A.

Dr. Pierre Milman graduated from Moscow State University in 1967, and obtained his Ph.D. from the University of Tel-Aviv in 1975, when he came to Toronto as a postdoctoral fellow. He held an NSERC University Research Fellowship at the University of Toronto from 1980 to 1985, and has been a Professor since 1986.

Dr. Milman has been a member of the Institut des Hautes Études Scientifiques, France, of the Max-Planck-Institut für Mathematik, Germany, and of the Weizmann Institute of Science, Israel, as well as a visiting Professor in Australia, U.S.A. and Japan. In 1996, he won a Connaught Transformative Research Award at the University of Toronto, in 1997 was elected Fellow of the Royal Society of Canada, and in 2000 was awarded a Killam Research Fellowship. One of his former pupils, Alexander Brudnyi, won the CRM André-Aisenstadt Mathematics Prize in 2002.

Le prix Jeffery-Williams rend hommage aux mathématiciens ayant fait une contribution exceptionnelle à la recherche mathématique.

Edward Bierstone et Pierre Milman sont les collauréats de ce prix en raison de l'excellence de leur travail dans le domaine des propriétés analytiques et géométriques des espaces singuliers.

Ensemble, ils ont trouvé une preuve simple d'une version canonique du théorème d'Hironaka sur la résolution des singularités. En transformant ainsi un résultat qui faisait figure de monument à contempler en un instrument pratique, ils ont jeté un éclairage nouveau sur le processus de résolution et l'ont rendu plus accessible, tout en étendant sa portée et celle de ses applications à une gamme d'espaces beaucoup plus large.

Récemment, en collaboration avec Wieslaw Pawlucki, ils ont achevé une percée d'un problème classique posé par Whitney sur le prolongement des fonctions différentiables. Leur approche a mené à la solution du problème par Fefferman.

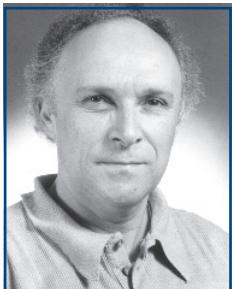
MM. Bierstone et Milman ont contribué de façon novatrice à la géométrie des ensembles sous-analytiques, en étudiant leur rapport aux fonctions différentiables. Parmi leurs résultats, citons les solutions des problèmes anciens sur les fonctions composées différentiables, et sur les stratifications semi-cohérentes. On s'attend à ce que leurs méthodes leur permettent, ainsi qu'à d'autres, de découvrir de nouvelles caractéristiques importantes des espaces singuliers.

Edward Bierstone a obtenu son baccalauréat ès sciences de l'Université de Toronto en 1969 et son doctorat de l'Université Brandeis en 1973, sous la direction de Richard S. Palais. Il est retourné à Toronto comme professeur en 1973 et y est titulaire depuis 1982.

Edward Bierstone a été tour à tour membre de l'Institut des Hautes Études Scientifiques de Bures-sur-Yvette, en France, membre de l'Institut des Études Supérieures de Princeton, et professeur invité dans des établissements brésiliens et français. Il est devenu membre de la Société royale du Canada en 1992, il a reçu le prix d'excellence en enseignement de la Faculté des arts et des sciences de l'Université de Toronto en 1996, et il est devenu membre (fellow) de l'Institut Fields en 2002.

CMS Awards Announcement / Lauréats des Prix de la SMC

M. Bierstone a présidé le comité de sélection des subventions du CRSNG, Mathématiques pures et appliquées A (336).



Dr. Pierre Milman
University of Toronto

Pierre Milman a obtenu son baccalauréat de Moscow State University en 1967, et son doctorat de l'Université de Tel-Aviv en 1975, la même année qu'il est arrivé à Toronto. Il a été boursier de recherche du CRSNG à l'Université de Toronto de 1980 à 1985, et il est devenu professeur titulaire en 1986.

Pierre Milman a été membre de l'Institut des Hautes Études Scientifiques, en France, membre du Max-Plank-Institut fur Mathematik,

en Allemagne, membre de l'Institut Weizmann, en Israël, et professeur invité dans des établissements australiens, américains et japonais. Il a reçu une bourse de recherche transformative Connaught à l'Université de Toronto en 1996, il est devenu membre de la Société royale du Canada en 1997, et il a obtenu une bourse de recherche Killam en 2000. Un de ses anciens élèves, Alexander Brudnyi, a reçu le Prix Mathématique André-Aisenstadt du CRM en 2002.

RECIPIENTS/LAURÉATS

2004 Joel Feldman British Columbia	1986 C. Herz McGill
2003 Ram Murty Queens	1985 L. Siebenmann Paris-Sud
2002 Edwin Perkins British Columbia	1984 C.S. Morawetz Courant
2001 David Boyd British Columbia	1983 R.H. Bott Harvard
2000 Not Awarded	1982 J. Lipman Purdue
1999 John Friedlander Toronto	1981 J.E. Marsden Berkeley
1998 George Elliott Toronto & Copenhagen	1980 R.P. Langlands Princeton
1997 S. Halperin Toronto	1979 I. Halperin Toronto
1996 M. Goresky Northeastern	1978 G. Gratzer Manitoba
1995 R.V. Moody Alberta	1977 G. Duff Toronto
1994 D. Dawson Carleton	1976 M. Wyman Alberta
1993 J. Arthur Toronto	1975 N.S. Mendelsohn Manitoba
1992 I. Sigal Toronto	1974 H.J. Zassenhaus Ohio State
1991 P. Lancaster Calgary	1973 H.S.M. Coxeter Toronto
1990 R. Steinberg U.C.L.A.	1972 P.J. Davis Brown
1989 E.C. Milner Calgary	1971 W.T. Tutte Waterloo
1988 J. Lambeck McGill	1970 W.A.J. Luxemburg Cal Tech
1987 L. Nirenberg Courant	1969 R. Pyke Washington
	1968 I. Kaplansky Berkeley

2005 CMS Excellence in Teaching Award



Dr. Philip Loewen
University of British Columbia

The winner of the Canadian Mathematical Society's second Excellence in Teaching Award is Dr. Philip Loewen, Professor of Mathematics at the University of British Columbia (UBC).

Philip Loewen has an incredible record in teaching over many years, resulting in an enormous positive influence on his faculty colleagues, his postdoctoral fellows and graduate students and, most of all, on his undergraduate students.

Loewen's students paint a portrait of a teacher who gives exceedingly clear lectures, motivates students to think deeply and is intensely dedicated to encouraging students to work hard and appreciate the value of Mathematics. Philip Loewen is consistently precise, rigorous, well-organized and richly motivated in his lectures. At the same time he is a magician with words, concepts, ideas and specific topics. His students acknowledge that he is very demanding, requiring that they understand the mathematical concepts and learn how to apply them to practical problems. His lectures are as highly appreciated by the students of the Honours program

in Mathematics as by the engineering students. The students' comments include: "his ability to weave additional layers of knowledge into his mathematical tapestry", "He showed us the beauty of maths", "He teaches with vivid descriptions... which come from his enthusiasm for and love of math."

Loewen won UBC's prestigious Killam Teaching Prize in Science for 1999-2000. In autumn 2004, the first year he became eligible again for the competition, his students spontaneously nominated him. The students also report that "Dr. Loewen makes himself readily available to help any who will come to his door." "He has the ability to make a student feel important and empowered in an environment where many undergraduates begin to doubt themselves." Philip Loewen has extensive online resources for his students, including detailed full lecture notes in PDF format. His web notes often contain extra enriching material not covered in the lectures.

Philip Loewen is very involved in promoting high-quality instruction at the largest possible scale: late each summer, he runs an orientation session for

RECIPIENTS LAURÉATS

2004 Leo Jonker
Queen's

mathematics instructors new to UBC. The session brings the newcomers together with senior faculty to describe and discuss some of the mechanics and expectations of teaching at UBC.

Philip Loewen has been active in mathematics education at all levels, from consultation on the secondary school curriculum in British Columbia to supervision of postgraduate students and postdoctoral fellows. He is an active member of the BC Association of Mathematics Teachers (BCAMT) and, until July 2004, he served as a Post Secondary Representative on the Executive of the BCAMT. In 1999-2001 he was involved with the Pacific Institute for Mathematical Sciences Elementary Grades Mathematics Contest. He often volunteers to help grade papers for the Euclid Mathematics Contest and is involved in issues of Mathematics curriculum development for Grades 11 and 12 with the BC Ministry of Education. He co-chaired a working group

on the preparation for university engineering and science courses at the 2003 Canada School Mathematics Forum. He has chaired the Department's Curriculum Committee since 1999 and was the Department Co-op Program Co-ordinator from 1996 to 2002.

Philip Loewen obtained his B.Sc. in Mathematics (Honours) in 1981 from the University of Alberta and then his M.Sc. and Ph.D. from the University of British Columbia in 1983 and 1986, respectively. After completing a NSERC-sponsored postdoctoral fellowship at Centre de Recherches Mathématiques in Montreal and Imperial College of Science and Technology in London, UK, he joined the University of British Columbia in 1987.

Throughout his career Philip Loewen has been an active researcher. In addition to his many research publications, he has written an outstanding advanced textbook on Optimal Control.

Prix d'excellence en enseignement de la SMC 2005

Le second Prix d'excellence en enseignement de la Société mathématique du Canada (SMC) est décerné à Philip Loewen, professeur de mathématiques de l'Université de la Colombie-Britannique (UBC).

Menant depuis de nombreuses années une carrière époustouflante dans l'enseignement, Philip Loewen est reconnu pour la grande influence qu'il exerce sur ses collègues, sur les chercheurs postdoctoraux et les étudiants des cycles supérieurs qu'il dirige et surtout, sur ses étudiants de premier cycle.

Les étudiants de Philip Loewen tracent le portrait d'un enseignant réputé pour la clarté de ses cours qui pousse constamment ses étudiants à approfondir leur réflexion, à se dépasser et à apprécier la valeur des mathématiques. Toujours précis, rigoureux, organisé et passionné en classe, il exerce aussi sa magie au contact des mots, des concepts et des idées. S'ils reconnaissent qu'il est très exigeant, qu'il les oblige à comprendre les concepts et à savoir les appliquer à des problèmes pratiques, ses étudiants de la spécialisation en mathématiques et de génie apprécient énormément ses cours, comme en témoignent ces commentaires : « il a le don de tisser tout un amalgame de connaissances en une superbe tapisserie mathématique », « il nous a fait apprécier la beauté des mathématiques », « il emploie toujours des exemples percutants [...] », qui témoignent de son enthousiasme et de son amour des mathématiques ».

Philip Loewen a remporté le prestigieux prix Killam d'enseignement en sciences de l'UBC en 1999-2000. À l'automne 2004, à sa première année d'admissibilité au concours, ses étudiants ont spontanément présenté sa candidature à nouveau. Écoutons encore ce que ces derniers avaient à dire : « M. Loewen est toujours prêt à aider quelqu'un qui se présente à son bureau; il a le don d'amener ses étudiants à se sentir importants dans un milieu où bien des étudiants de

premier cycle commencent à douter d'eux-mêmes ». Il met en outre à la disposition de ses étudiants toute une collection de ressources sur le Web, y compris toutes ses notes de cours détaillées en format PDF. Ces notes contiennent souvent du matériel d'enrichissement non couvert dans les cours.

Philip Loewen attache une importance particulière à promouvoir l'excellence en enseignement. À la fin de chaque été, il organise une séance d'orientation destinée aux nouveaux professeurs de mathématiques de l'UBC. La séance réunit les nouveaux professeurs et des professeurs expérimentés, qui discutent des méthodes et des attentes au niveau de l'enseignement à l'université.

Philip Loewen est actif dans le milieu de l'éducation mathématique à tous les niveaux, tant comme consultant au sujet des programmes provinciaux de mathématiques du secondaire qu'à la direction d'étudiants aux cycles supérieurs et de chercheurs postdoctoraux. Il est un membre actif de l'Association des enseignants de mathématiques de la C.-B et, jusqu'en juillet 2004, il était le représentant (palier postsecondaire) de cette association. De 1999 à 2001, il a pris part à l'organisation du concours de mathématiques de l'Institut du Pacifique pour les sciences mathématiques au primaire. Il s'offre aussi souvent pour corriger les examens du concours Euclid et contribue au développement des programmes de mathématiques de 11e et de 12e année en collaboration avec le ministère de l'Éducation de la province. Il a en outre coprésidé un groupe de travail sur la préparation aux études universitaires en génie et en sciences dans le cadre du Forum canadien sur l'enseignement des mathématiques 2003. Il dirige le comité des programmes de son département depuis 1999 et il a coordonné les programmes d'alternance travail-études du département de 1996 à 2002.

CMS Awards Announcement / Lauréats des Prix de la SMC

Philip Loewen a obtenu son baccalauréat ès sciences avec spécialisation en mathématiques en 1981 de l'Université de l'Alberta, puis sa maîtrise et son doctorat de l'UBC en 1983 et en 1986 respectivement. Après un stage de recherche postdoctorale subventionné par le CRSNG au Centre de recherches mathématiques à Montréal et à l'Imperial College of Science and Technology à Londres, il s'est joint au corps professoral de l'UBC en 1987.

Durant toute sa carrière, Philip Loewen a été un chercheur actif. Outre ses nombreuses publications scientifiques, il a publié un manuel exceptionnel de contrôle optimal avancé.



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Award's Presentation - Summer 2005 Banquet Présentation des prix, Banquet de l'été 2005



H.E.A. Campbell, Barbara Lee Keyfitz, Finnur Larruson



H.E.A. Campbell, Pierre Milman,
Edward Bierstone, Finnur Larruson



J. Harley Weston, Philip Loewen, H.E.A. Campbell

CMS Prize Lectureships and Awards Programmes Prix et bourses de la SMC

The most up-to-date information concerning all CMS Prize Lectureships & Awards programmes, including complete lists of recipients, can be found at:

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 :

www.cms.math.ca/Prix/

Un peu plus loin dans cet article, je vous parlerai comme toujours de notre principale activité scientifique, la Réunion d'été de Waterloo. D'abord, toutefois, j'aimerais porter votre attention sur la situation financière précaire de la Société et les mesures que le comité exécutif et le conseil d'administration ont prises pour redresser la situation.

Vous êtes nombreux à savoir que nos publications constituent notre principale source de revenus. Les abonnés hors Canada paient en dollars US. Cette situation pose de nombreuses contraintes que je n'aborderai pas ici en détail, sauf pour dire que nous avons les mains liées à de nombreux égards. La force de notre dollar par rapport à la devise américaine signifie que la SMC encaisse un déficit qui prend des proportions alarmantes. Et bien des spécialistes s'attendent à ce que notre dollar demeure fort.

Il faut donc faire des choix : chercher des moyens d'économiser; réduire nos activités, ou nos dépenses et par conséquent; accroître nos revenus. La seconde de ces trois options entraîne des risques considérables pour la Société, puisque nos activités reposent sur un grand nombre de nos membres, qui seraient certainement offusqués de nous voir réduire notre soutien aux activités de la Société.

Le comité exécutif et le conseil ont donc opté pour une combinaison de la première et de la troisième option. Le comité des finances a recommandé la formation d'un comité spécial qui s'occupera de réduire nos dépenses, proposition que l'exécutif et le conseil ont acceptée. Le comité spécial se compose de Jamie Mingo (Queen's), David Rodgers (Michigan), Arthur Sherk (Toronto, président) et de Graham Wright (directeur administratif). Yvette Roberts (comptable de la SMC) et moi-même appuyons également le comité dans ses travaux. Le comité a étudié plusieurs postes de dépenses et fera des recommandations qu'il présentera à l'exécutif et au conseil en temps opportun.

Une décision très importante a été prise à la réunion du conseil d'administration en juin dernier. Le conseil a adopté la recommandation de l'exécutif de créer un poste de collecte de fonds au bureau administratif, qui recevra l'appui d'un partenaire externe, le service d'avancement externe de l'Université Queen's. Dans les mois à venir, nous travaillerons avec ce service, qui nous aidera dans nos activités de financement. Il s'agit là d'une initiative très importante pour la Société, à laquelle je consacrerai une bonne partie de mon temps en tant que président. Nous vous reparlerons de cette initiative au cours des prochains mois.

La Réunion d'été de Waterloo a remporté un franc succès. Attrayant quelque 540 participants, ce congrès tenu conjointement avec la Société canadienne d'histoire et de philosophie des mathématiques est probablement le plus populaire de notre histoire. Nous y avons reçu les conférenciers pléniers **Len Berggren** (Simon Fraser), **Keith Devlin** (Stanford), **Dan Freed** (Texas - Austin), **Robert McCann** (Toronto), **Andrei Okounkov** (Princeton), **Gilles Pisier** (Université Paris 6, Texas A&M) et **Ken Ribet** (California - Berkeley). La conférence du prix Krieger-Nelson a été prononcée par **Barbara Lee Keyfitz** (Houston), directrice de l'Institut Fields, et la conférence du prix Jeffery-Williams, par **Edward Bierstone** (Toronto) et **Pierre Milman** (Toronto). Le Prix d'excellence en enseignement de la SMC a été décerné à **Philip Loewen** (UBC).

Au total, 23 sessions couvrant l'ensemble du spectre des mathématiques et de l'histoire et de la philosophie des mathématiques étaient au programme : *Suites automatiques et sujets reliés; Combinatoire et géométrie; Variables complexes; Géométrie discrète et computationnelle; Systèmes dynamiques; Problèmes d'exploration de salle de classe en calcul; Équations fonctionnelles et leurs applications; Topologie générale et ses applications; Topologie géométrique; Histoire et philosophie des mathématiques; Histoire des mathéma-*

tiques de l'Islam médiéval à l'Europe de la Renaissance; La théorie des invariants et la géométrie différentielle; Fonctions L et courbes algébriques; Aspects mathématiques de l'informatique quantique; Mathématiques des temps anciens aux temps modernes; Mathématiques financières actuarielles; Mathématiques de l'algèbre et de l'analyse computationnelles; Équations aux dérivées partielles non linéaires; Algèbres d'opérateurs, espaces d'opérateurs et analyse harmonique; Les graphes aléatoires et leurs applications; La théorie des représentations; Théorie des cordes et systèmes intégrables, ainsi qu'une session de communications libres. Le CRSNG a également donné un atelier sur la préparation d'une demande de Subvention à la découverte.

La Réunion a été organisée de main de maître par **Andu Nica** et **Frank Zoritzto** – tous deux de l'Université de Waterloo –, superbement appuyés par les nombreux organisateurs de sessions. J'aimerais aussi remercier **Kim Gingerich**, **Lis D'Alessio** et **Shonn Martin** (Waterloo) ainsi que le personnel du bureau administratif de la SMC de tout le travail accompli. Pour la réussite exceptionnelle de l'événement, la SMC est grandement redevable à ce groupe de personnes travaillantes et extrêmement organisées. Merci également à nos nombreux commanditaires, en particulier la **Faculté de mathématiques de l'Université de Waterloo**, mais aussi le **Centre de recherches mathématiques ; l'Institut Fields ; MITACS ; l'Institut du Pacifique pour les sciences mathématiques ; A.K. Peters ; l'Institut du calcul quantique ; Springer ; l'Université de Guelph ; le Département de mathématiques et de statistique de l'Université Queen's et le Département de mathématiques pures de l'Université de Waterloo**.

Je vous rappelle que notre Réunion d'hiver se tiendra du 10 au 12 décembre 2005 à Victoria (C.-B.), et j'espère vous y voir en grand nombre.

ANNUAL GREETINGS

Again, in this opening column for the new academic year, I have a request. I hope that this column will reflect a diversity of mathematical practice at all levels of education across the country and serve as a clearinghouse for informed opinion and mathematical examples for students. I am also interested in news of all sorts, in particular of honours that members of your department might receive in recognition of their teaching or exposition of mathematics to a larger public. While this column cannot claim to cover everything, I hope that with every issue, the readership can find something interesting, useful or provocative.

In May of this year, the second of a brace of mathematical education fora was held, this time in Toronto. It appears that there will be a national organization of mathematics educators, including teachers of all levels along with researchers. This is a positive development. Less positive is the suggestion that a similar forum be organized in two years. The two fora held in Montreal and Toronto were originally intended to be extraordinary meetings, and as such were able to draw upon a fairly wide audience. To continue the series as it stands would probably narrow its scope and dissipate resources. After all, the Canadian Mathematics Education Study Group is already in existence and enjoys success as a meeting place for folks in mathematics and in educational research. It would be better to form the new national body of educators, and then let it be the sponsor of annual or biennial conferences. In this way, a new regular conference would develop its own specific character and sources of funding.

One of the highlights of May's event was a cogent talk by Brent Davis of the education faculty at the University of Alberta. As teacher professional development is a hot issue and he crystallized the components of this very clearly, I am pleased that he agreed to submit the article to these *CMS Notes* that is reproduced below.

Although my political philosophy is conservative, I nevertheless support and follow the activities of the *Canadian Centre for Policy Alternatives*, which generally provides an informed, leftish and thoughtful study of social issues that lie beyond the radar of parties other than the New Democrats. Members are entitled to receive its magazine, the *CCPA Monitor*; the issue for February, 2005 (Vol. 11, No. 8) had an interesting article by David Stocker on using social justice issues in the teaching of mathematics to middle school students in Toronto. A précis is provided below. Readers might wish to compare this account of Stocker's work with the review of the package produced by *médecins sans frontières* (*CMS Notes* 37 (2), March, 2005; p. 10). You can visit the website of the CCPA at <http://www.policyalternatives.ca>.

In the last round of curriculum revisions, the Ontario Government introduced a Grade 12 course on data management. This course is supported in great measure by Statistics Canada, which has posted a wealth of material on its website www.statcan.ca

in both official languages. We conclude this section with brief mention of a recent project undertaken by this organization. *EJB*

Mathematics-for-teaching: Interrogating the beliefs that give shape to current research and practice

The issue of teachers' knowledge has been a prominent one for several decades now. However, little progress has been made toward a consensus on the question of what they need to know. At the University of Alberta, for example, teacher candidates in the secondary route (Grades 7-12) require a minimum of twelve 3-credit courses in mathematics. A few are designed specifically for teachers, but the bulk is drawn from 'stock' listings that include introductory calculus, linear algebra, discrete mathematics and introductory statistics. This is not atypical. In most English Canadian universities, prospective secondary teachers are required to take similar (*i.e.* generic) courses and most elementary education programs require only one 3-credit course, usually specially designed, that focuses on process rather than any particular content.

These practices seem to be held in place by an assumption that courses in formal mathematics are vital to effective teaching. Unfortunately, this belief is not easily substantiated. Begle (1979) and Monk (1994) demonstrated at best a weak relationship between generic courses taken by teachers and their students' performances on standardized examinations. Such results have prompted a belief that an emphasis on *more* mathematics in teacher education programs may be inappropriate. It might be that teachers require *more nuanced understandings* of the topics in a conventional curriculum. It is this sort of sensibility that underpins the few specialized courses offered at our and many other universities. Yet even here there is little agreement on what should be emphasized.

In an effort to help inform discussions of the sorts of mathematical competencies that are necessary for effective teaching, colleagues *Elaine Simmt*, *Dennis Sumara* and I are just beginning the second half of a 6-year investigation of the mathematics that teachers know (Davis & Simmt, *in press*). This work is anchored in the assumption that most experienced mathematics teachers have a wealth of mathematical knowledge, although much of this know-how may never have been an explicit aspect of their educations. Indeed, it may not be properly recognized as part of the formal disciplinary body of knowledge. As such, the project, involving a group of 24 teachers, is aimed at explicitly representing teachers' mathematics-for-teaching.

The cohort of teachers is a diverse one, with grades from Kindergarten through high school represented. In terms of professional experience, a few of the participants are at the beginning of their careers; several have taught for decades; the rest fall somewhere in between. Most of the teachers are generalists, but two are mathematics specialists. Some teach in small urban centres; some teach in rural locations. The cohort meets for daylong seminars, scheduled every few months. Topics have ranged from

general issues, such as problem-solving, to specific curriculum topics, such as multiplication (developed below). Our research is organized around extended, group-based engagements with seemingly narrow tasks — ones that often appear to have immediate and well-established responses. For example, one session was framed by the question, “What is multiplication?”

As might be expected, the immediate response and general consensus was that multiplication was “repeated addition” and “a grouping process”. And then discussion ceased ...until we followed up with, “And what else?”

With this prompt, participants began working together in self-selected groups of four or five, assembling lists of interpretations, metaphors, images, and applications that give shape to their understandings of the topic. Those lists were then “read against” one another in a whole group discussion, generating the following list:

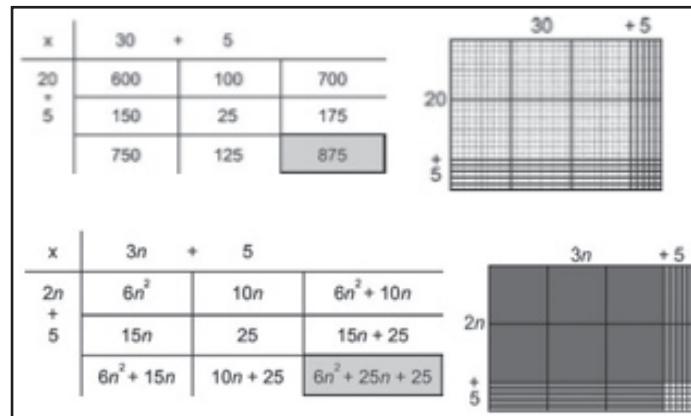
Multiplication has to do with ...

- repeated addition;
- grouping;
- sequential folding;
- many-layering;
- ratios and rates;
- the reverse/inverse of division;
- a sort of “in-between” operation of addition and exponentiation;
- grid-generating;
- dimension-changing;
- number-line-stretching or -compressing;
- rotating.

The balance of the session was devoted to discussions of how varied interpretations arise, how they might contribute to more robust (or more fragile) understandings, how topics in multiplication unfold through the K-12 curriculum, how they might be framed to capitalize on previous learning while supporting future studies, and so on. In the course of these discussions, teachers demonstrated a rich knowledge of diverse algorithms for and applications of multiplication, but it was clear that this knowledge was grade-specific and, considered on a collective level, fragmented. For the most part, teachers demonstrated little awareness of their students’ prior or subsequent experiences with the topic — contributing to, for example, overemphasises on restricted definitions and rigid algorithms in the early grades and failure to take advantage of earlier educational experiences in the higher grades.

These issues were in large part resolved during the session, however, as teachers debated various emphases and eventually came to a consensus around an array-based multiplication strategy that foregrounds the interconnectedness of various meanings of multiplication through a typical curriculum. The

method, illustrated below, can be readily adapted for multiplication of decimal fractions, common fractions, mixed numbers and polynomials — in brief, almost the entire range of applications encountered in Grades K through 12.



I develop this example in some detail, because it can be used to highlight some key issues that have arisen for us around the investigation of teachers’ knowledge of mathematics and pre-service programs in mathematics pedagogy. I focus on five issues here, linking them to the foregoing example.

First, discussions of teachers’ mathematical knowledge tend to be framed by an assumption that the individual is the sole site of knowledge production. In our work, we deliberately take a more collectivist approach. Our rationale is that teaching always occurs in group settings — that is, in spaces that not only invite, but compel negotiation of meanings and understandings. In the multiplication example, for instance, the ‘insights’ were decidedly collective. It would be impossible (not to mention pointless) to identify particular aspects of the final ‘answer’ with specific individuals.

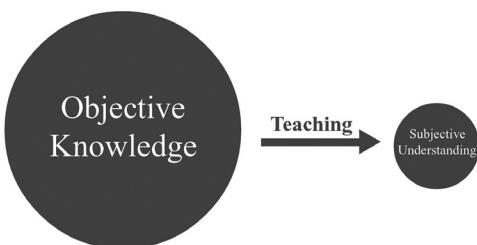
Second, discussions of teachers’ mathematics tend to focus on what might be called the ‘front end’ of knowledge — on established processes and conclusions — rather than on images, analogies, metaphors and applications that give shape to concepts. So pervasive is the emphasis on formal and explicit knowledge that the teachers had difficulty seeing their assembled list as mathematical, let alone as mathematics. Further, several attested to their surprise at the ‘depth’ of the list, noting that few of the represented entries had been an explicit part of their own education, nor were they explicit parts of their own pedagogy. It is thus that, in this research, we focus on teachers’ enacted knowledge as well as their explicit knowledge, inquiring into what sorts of understandings bubble to the surface when teaching.

Third, investigations of teacher knowledge tend to be level-specific, focused on the grade(s) they teach. While not disputing the importance of this emphasis, we also note the value of discussion to span grades. In particular, the commonplace separation

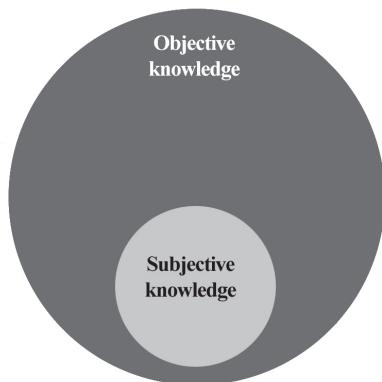
of pre-service and in-service programs into elementary and secondary strands can present some significant problems.

Fourth, investigations of teachers' mathematics have overwhelmingly been founded on an assumption that their knowledge is static. Moreover, they have been organized around uncritical shopping lists of the sorts of topics that others believe teachers should know, thus giving rise to report after report of what teachers *don't* know. Instead of this emphasis on static deficiency, in our research we regard knowledge in terms of dynamic sufficiency. We understand that knowing is constantly changing, in part because of our efforts to study such knowing. Further, we feel it important to be attending to what teachers *do* know — for the time being, at least, until we have a much better sense of the sorts of mathematical knowledge that are necessary to effective pedagogy,

Fifth, we note that discussion of teachers' mathematics tend to be organized around a radical break between 'objective knowledge' and 'subjective understanding'. This issue is no doubt anchored in the ancient assumption that pure knowledge exists on a metaphysical plane and that humans must use their wits and experience to bridge the gap that separates personal construals of the world from actual truths about the world.

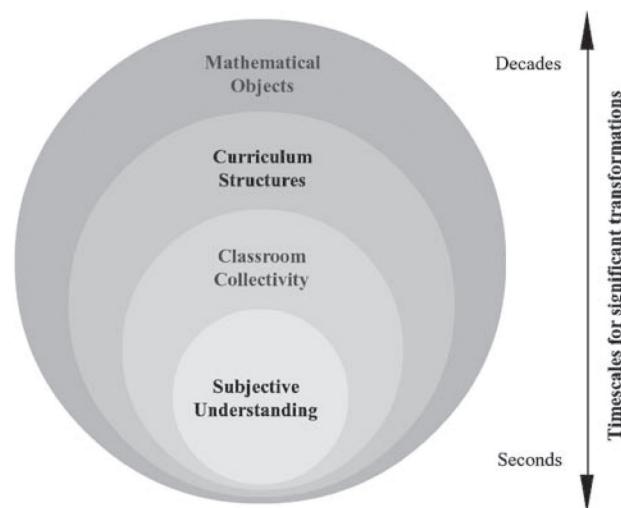


Contemporary theories of knowing and knowlege depart from such conceptions, tending to invoke notions of nested rather than discrete realms. In terms of the discourses that are now most prominent in discussions of mathematical pedagogy — namely radical constructivism, which focuses on individual sense-making, and various social constructionisms, which are more concerned with the emergence of bodies of knowlege — subjective understanding and objective knowledge are seen to be enfolded in and to enfold from one another.



While this move does represent an important development in discussions of mathematics education, it also serves to perpetuate some troublesome separations. For instance, despite the fact that mathematics has been acknowledged to be subject to revision and elaboration — that is, mathematics is seen to evolve — in the context of teachers' knowledge of mathematics, it is still treated as fixed backdrop and responsibility for this aspect of their education tends to be assigned to Departments of Mathematics. By contrast, subjective understanding is seen as inherently volatile, and responsibility for the development of this topic is usually assigned to Faculties of Education. The epistemological shift witnessed in the field over the last quarter-century has prompted little or no reorganization of the project of teacher preparation.

Part of the reason for this lack of meaningful modifications in programs, we suspect, is that the continued emphasis on two domains makes it easy to sustain a separation between the topic of established knowledge and the topic of how mathematics is established. Moreover, we worry that this emphasis contributes to a certain blindness to other complex, emergent forms that arise in the interactions of individual knowers and that are nested in bodies of collective knowledge. In particular, with regard to discussions of teachers' mathematics, it seems that relatively little attention is given their knowledge of the dynamic forms of curricula and classrooms.



In other words, rather than framing discussions of teacher expertise in terms of the categories of objective knowledge and subjective understanding, we organize our investigations around models in which these categories are two aspects in a grander continuum. When other levels of nested organization are examined, the tidy distinction that tends to be enacted between issues of objectivity and subjectivity becomes ever more troublesome. For example, matters of established mathematics come to be entangled in concerns for how curricula are constituted, which must be brought to bear on how classrooms are organized and

how, in turn, the subject matter comes to be understood. What is more, the self-similar dynamics that operate at the various levels — albeit on very different time scales — emerge as a vital issue when making sense of mathematics pedagogy.

The point here is mathematics-for-teaching is likely considerably more complex than has generally been assumed. In particular, it seems that it cannot be considered in terms of readily defined concepts or competencies that can be organized into courses designed especially for teachers. Rather, we would argue, such courses must give special attention to the dynamics of knowledge production — and we would offer our work with practising teachers as an example. If the hope is that teachers might be capable of organizing rich and meaningful knowledge-producing experiences for their students, it would seem sensible to argue that they must not only be involved in similar sorts of experiences in their mathematics courses, but that they have opportunity to examine closely the structural dynamics at work in such settings.

As well, we contend, the focus of such study be critically re-evaluated. The current practice of compelling teachers to study more advanced topics to ones presented in typical curricula might be pointed in exactly the wrong direction. As the multiplication example demonstrates, a sophisticated knowledge of mathematics-for-teaching might depend more on the capacity to engage more deeply with ‘simple’ ideas, rather than a capacity to demonstrate competence with more complicated ones.

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Brent Davis (brent.davis@ualberta.ca)

Social Justice in the Mathematics Class

A snail is climbing a tree 10 m high. Every day, the snail climbs 3 m. Each night, it slides back 2 m. How many days will it take to reach the top of the tree? That is one committed snail, remarks David Stocker. But his middle school students do not care at all about its progress, and he does not blame them.

Stocker teachers at City View Alternative School on Shirley Street in Toronto’s Parkdale area. He finds that the “pizza party” types of problems that parade as real-life are deceptively artificial. “A distinction must be made,” he emphasizes, “between using things in the world around us to do math upon, and using math to understand the world around us.”

He proposes a more dangerous approach, asking questions that encourage people to think, and perhaps intervene in their reality. Why do some of the wealthiest countries of the world have infant mortality rates similar to developing countries? What do marketing claims actually mean? Do IMF and World Bank policies create poverty? Questions like this cannot be adequately handled “without the ability to do statistical analysis, to use very large numbers confidently, to identify patterns and relationships and distinguish between correlation and causation, to point out where ideology and measurement converge, and to convey complicated ideas in comprehensive ways”. These are *mathematical* questions.

To those who disdain the introduction of social justice issues into the mathematics classroom, Stocker would respond that crucial connections have not been made, as those things that tend to affect the everyday lives of people tend to be divorced from the broader political and economic context. In Stocker’s classroom, “discussion crackles”. Students discuss human agency in the creation of famines, the relative magnitudes of “corporate welfare” and social assistance in the economy, and how much of the cost of goods that accrues to the primary producer, for example.

To use class time honestly and with integrity imposes a great responsibility upon a teacher, who after all enjoys a natural position of authority and influence. David Stocker maintains that decisions about selecting material are always political. The standard choice of classroom topics is not neutral; “it uses up opportunities for students to engage with their real worlds, to discuss change and possibilities”. He finds that, with this material, the students even learn better and fulfil the expectations laid out in curriculum documents. Certainly, middle school students are old enough to engage such issues. One can hardly maintain that our present world is without serious moral and ethical problems. Providing the new generation with the knowledge and tools, including mathematical ones, to address them should loom large in our educational regime.

David Stocker is preparing a school teaching resource with 50 social-justice-oriented mathematics lessons entitled *math that matters*. *EJB*

Census at School

Students across Canada are becoming involved in the International Census at School project. Through an online survey, they are asking and answering questions about their own lives and that of their peers. This project began in the United Kingdom in 2000 and now has spread to Australia, New Zealand,

South Africa and our country. Teachers have created online resources to encourage students in graphical analysis, exploration of relationships and other sorts of analysis. Statistics Canada has appointed regional representatives to make contact with teacher and teacher-librarian associations, school boards and departments of education, curriculum and technology specialists and publishers of textbooks and software. These are Yves Saint-Pierre (Québec), Sunita Kossta (Ontario), Danielle Rondeau (Prairie provinces, NWT, Nunavut), Stephanie Bush (Atlantic provinces) and Marion Smith (BC and Yukon).

Statistics Canada also officially releases its own research results through *The Daily* available on the net, provides profiles of various types of communities and compiles Canadian statistics for easy access. It has developed a tool *E-STAT* to aid students and teachers in accessing and processing data. The website is www.statcan.ca, and the Census project can be accessed at www.censusatschool.ca. *EJB*

CMS Excellence in Teaching Award

for post-secondary undergraduate teaching in Mathematics

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pour l'enseignement collégial et de premier cycle universitaire en mathématiques

Recognizing sustained and distinguished contributions in teaching. Full-time university, college, two-year college, or CEGEP teachers in Canada with at least five years teaching experience at their current institution can be nominated.

For details regarding nomination procedure, please visit www.cms.math.ca/prizes or <http://hed.nelson.com>

**Deadline for nomination is:
November 15**

Nelson & Brooks/Cole, Thomson Businesses are proud sponsors of this award.



Ce prix récompense des contributions exceptionnelles et soutenues en enseignement. Il s'adresse aux professeures et professeurs d'université, de collège ou de cégep au Canada ayant au moins cinq ans d'expérience dans leur institution présente.

Pour les détails sur la procédure de mise en nomination voir www.cms.math.ca/prizes ou <http://hed.nelson.com>

Date limite pour soumettre une candidature : 15 novembre

Nelson et Brooks/Cole, Entreprises Thomson sont fiers de commanditer ce prix.

CALL FOR SITES DEMANDES DE PROPOSITIONS D'EMPLACEMENTS

Interested in hosting a CMS Meeting?

The summer and winter meeting sites are confirmed to the year 2008 (Summer Meeting - see Calendar of Events). The CMS Research Committee invites requests from departments interested in hosting a CMS Meeting for Winter 2008 onwards. The head of the department should write to the chair.

Êtes-vous intéressés à être l'hôte d'une réunion de la SMC?

Les lieux des réunions d'été et d'hiver sont confirmés jusqu'à l'an 2008 (réunion d'été - voir le calendrier des événements). Le Comité de la recherche de la SMC invite les départements intéressés à tenir l'une de ces réunions en hiver 2008 ou plus tard à soumettre une proposition. Les chefs de département intéressés doivent soumettre leur propositions au président.

Dr. Finnur Lárusson, Chair/Président

CMS Research Committee / Comité de recherches de la SMC

Department of Mathematics

The University of Western Ontario

London, Ontario N6A 5B7 Canada

CMS WINTER 2005 MEETING - VICTORIA, BC

DECEMBER 10 - 12, 2005
HOST: UNIVERSITY OF VICTORIA
Victoria Conference Centre

On behalf of the University of Victoria, the Department of Mathematics and Statistics invites the mathematical community to the Winter 2005 Meeting of the Canadian Mathematical Society (CMS).

Following the usual format of the CMS Winter Meeting, the program will include a wide variety of sessions, a contributed paper session, plenary and prize lectures, and a public lecture.

All activities and scientific talks will be held at the Victoria Conference Centre and the Empress Hotel.

For the most up-to-date information concerning the program, detailed schedules, registration forms and abstract submission forms, please visit the meeting website at www.cms.math.ca/Events.

Prizes and Awards

Coxeter-James Prize Lecture	Robert McCann (Toronto)
Doctoral Prize Lecture	Vasilisa Shramchenko (Concordia)
Adrien Pouliot Prize Lecture	to be determined
Distinguished Service Award	to be determined
G. de B. Robinson Award	to be determined

Plenary Speakers

Robert Guralnick (University of Southern California)
Uffe Haagerup (South Denmark University)
Bryna Kra (Northwestern University)
Andrew Majda (Courant Institute, New York University)
Oded Schram (Microsoft)

Contributed Papers Session

Org: C. Robert Miers (Victoria)

Contributed papers of 20 minutes duration are invited. There will be a maximum of 20 papers in this session. For an abstract to be eligible, the abstract, the contributor's registration form, and payment of registration fees have to be received before October 10, 2005. To assist the organizers, please include the Primary AMS Classification (www.ams.org/msc) and specify your wish to participate in the contributed papers session.

Business Meetings

The CMS will be holding the following business meetings:
Executive Committee Meeting: Thursday, December 8
Development Group Luncheon: Friday, December 9
Board of Directors Meeting: Friday, December 9

Social Events

The CMS will be holding the following social events:
Welcoming Reception: Friday, December 9
Banquet: Sunday, December 11
Complimentary coffee and juice will be available during the scheduled breaks.

Exhibits

Exhibits will be open from 9:30 AM to 4:00 PM on December 10 and 11 in the Foyer of the Victoria Conference Centre.

The Joint Exhibit features books and other products from publishers and other companies and organizations not represented at the meeting. Order forms will be available at the exhibit for your convenience. The CMS will forward any orders to the corresponding company after the meeting. Books and other materials that will be displayed at this Joint Exhibit will be donated to the host university.

We invite participants to visit the CMS Membership Booth and Book Display, located in the Foyer of the Victoria Conference Centre. A representative will be available from 9:30 AM to 5:00 PM on December 10 and 11, and from 9:30 AM to 4:00 PM on December 12 to answer questions about membership, publications, and other programs.

In response to members' suggestions, an Information Table will be set up in the registration area to display information of interest to participants. Please send a copy of your announcement to the CMS Meetings Coordinator, 577 King Edward, Ottawa, Ontario, Canada K1N 6N5, facsimile (613) 565-1539, meetings@cms.math.ca.

All announcements require prior approval. Once approved, the participant may display up to 100 copies of the announcement. The participant is responsible for providing all copies for display and for removing any remaining copies before 3:00 PM on the last day of the meeting. After that time, all remaining material will be discarded.

Announcements may not be posted in the registration or meeting area. Personal distribution of announcements and announcements of events competing in time or place with the meeting program are not permitted.

This table is not meant for material promoting products or services for sale. Those wishing to promote products for sale should contact the Meetings Coordinator for information on the Joint Exhibit.

CMS WINTER 2005 MEETING

Submission of Abstracts

For abstracts of talks to be published on-line and in the meeting programme, they have to be submitted by October 10, 2005, using the on-line form at cms.math.ca/forms/abs-w05. The organizers appreciate the cooperation of all speakers in observing this important deadline.

Abstracts for contributed papers can be sent to abstracts-w05@cms.math.ca. The email should contain the speaker's name, affiliation, email address, the Primary AMS Classification (www.ams.org/msc), title of talk and abstract (using LaTeX coding if possible).

Registration

The registration form is also available at www.cms.math.ca/Events and from:

CMS Executive Office
577 King Edward, Ottawa, Ontario CANADA K1N 6N5
Tel: 613-562-5702, Fax: 613-565-1539
office@cms.math.ca

Payment may be made by cheque, or by VISA or MasterCard. Although registration fees are given in Canadian dollars, participants may send cheques in US dollars by contacting their financial institution for the current exchange rate.

Please note that payment must be received in Ottawa by **October 31** in order to qualify for reduced rates. In order for your payment to be processed before the meeting, it should be received by **November 30**. Receipts will be provided at the meeting.

	Reduced rate	Regular rate
Plenary/Prize/Public Lecturers	\$ 0	\$ 0
Organizers	\$ 200.00	\$ 265.00
Session Speakers	\$ 225.00	\$ 295.00
Non-Members (fee includes CMS Membership)	\$ 373.00	\$ 443.00
Members CMS/AMS/MAA	\$ 225.00	\$ 295.00
One-day fee (on site only)	n/a	\$ 195.00
Postdocs/Students/Retired/Unemployed	\$ 100.00	\$ 130.00
Teachers (K-12, CEGEP, College)	\$ 100.00	\$ 130.00
Banquet (free for plenary/prize lecturers)	\$ 60.00	\$ 60.00

AMS = American Mathematical Society

MAA = Mathematical Association of America

Why Pre-register?

Some of the advantages to pre-registering are:

- reduced fees for early registration before November 1
- your name appears on the list of participants on the meeting web site

- your Meeting Package is waiting for you at the reception on Friday evening
- no waiting in line early Saturday morning to process your registration!
- banquet tickets are available now but may no longer be available on site

For all these reasons, we encourage you to pre-register, whether it be before or after the early registration deadline.

Refund Policy

Participants wishing to cancel their registration must notify the CMS Executive Office in writing by November 30 to receive a refund less a \$40 processing fee. Those whose contributed paper has not been accepted will upon request be fully refunded.

Do you qualify for free CMS membership?

An AMS or a MAA member who registers at a semi-annual meeting of the CMS and who is not a member of the CMS, is eligible for a one-time only, one-year free membership in the CMS.

If you qualify, please visit the CMS booth to complete a membership application form. Please provide proof of current AMS or MAA membership. This offer applies to new members only.

Participants registering in the Non-Member category will automatically receive a free one-year membership.

Accommodation

It is recommended that bookings be made early in order to avoid disappointment. All participants must make their own reservations. Blocks of rooms will be held at the locations given below until the date indicated. Reservations made after this date will be on a space available basis. Rates are per room per night and are quoted in Canadian dollars. The conference rate is usually available up to three days before and after the meeting; please quote the Group code. Reservations must be guaranteed by a one-night deposit or a major credit card.

When making your reservation, please clarify payment and cancellation policies as these vary from hotel to hotel. You should get a confirmation number for future reference.

Additional information regarding accommodation choices will be posted to the meeting web site as it becomes available.

Fairmont Empress

Booking deadline: November 8, 2005

Hotel code : MATHS, Promo code : GRCMS1
721 Government Street, Victoria, BC, Canada V8W 1W5

Applicable taxes: 7% GST, 10% PST

Phone: 250-384-8111, toll free: 1-800-866-5577

Fax: 250-389-2747 ; theempress@fairmont.com

Parking: \$22.00 per night for self-parking (passes available at front desk), \$25.00 per night for valet parking

Rates (single or double occupancy):

CMS WINTER 2005 MEETING

Fairmont Room - \$125.00, Fairmont Deluxe - \$165.00, Deluxe Harbourview - \$205.00

Suites from \$225.00, 10 Moderate rooms - \$80.00

\$30.00 per night for each additional person, maximum occupancy per room is 4 people. No charge for children up to age 18 who share with their parents, reduced meal rates for children.

Executive House Hotel

Booking deadline: November 6, 2005

Group code: Canadian Mathematical Society

777 Douglas Street, Victoria, BC, Canada V8W 2B5

Applicable taxes: 7% GST, 10% PST

Phone: 250-388-5111; toll-free 1-800-663-7001

Fax: 250-385-1323 reservations@executivehouse.com

Parking: \$2.00 per night, subject to availability

Rates (single or double occupancy):

Guest Rooms - \$75.00, One Bedroom Suites - \$90.00

\$15.00 per night for each additional person, no charge for children up to age 16 who share with their parents.

Child Care

Information regarding available child care may be provided by the meeting hotels. Advance research and arrangements are recommended. Please contact the hotels directly to make enquiries.

Travel

AKAL Airport Shuttle is providing a shuttle service from the airport to downtown every $\frac{1}{2}$ hour during the day and after every flight arrival at night. Pick-up at the hotel is available by reservation only. Please contact AKAL Airport Shuttle at (250) 386-2525 for further information. Please mention you are attending the CMS Meeting to take advantage of the special group rate of \$10.00 per person each way. This rate applies whenever at least 3 meeting participants are utilizing the shuttle at the same time.

A taxi fare from the airport to downtown costs approximately \$45.00.

Budget Rent-A-Car of Victoria Ltd. (www.budgetvictoria.com) can supply cars, trucks, passenger vans and luxury vehicles at special Conference rates. Their offices are located in the airport arrival hall and at 757 Douglas St. (across from the Victoria Conference Centre). For more information contact Budget at phone (250) 953-5300, fax (250) 953-5250, or e-mail reserve@budgetvictoria.com.

Detailed information regarding the University of Victoria, the city of Victoria, and the Province of British Columbia, including tourism information, local weather

and climate, site and street maps, and itineraries for self-guided tours, are available at the following websites:

- University of Victoria (www.uvic.ca)
- Tourisme Victoria (www.tourismvictoria.com)
- Travel BC (www.travel.bc.ca)
- Canada Weather Forecast
(http://weatheroffice.ec.gc.ca/city/pages/bc-85_metric_e.html)

Graduate Student Support

Limited funds are available to partially fund the travel and accommodation costs for bona fide graduate students at a Canadian or other university. Preference is given to Canadian students. To apply for this funding, applicants should submit a letter written by their supervisor or departmental graduate advisor, providing the following: name of student, area of study and level, how the student will benefit from the meeting, whether or not the student be speaking, and what support is available from other sources.

This letter should be sent before October 10, 2005 to gradtravel-w05@cms.math.ca. Applicants will be notified early in November of the funding decision.

If successful, the student will receive a cheque for reimbursement of expenses after the meeting and upon completion and submission of the standard Travel Expense Claim Form, along with appropriate original receipts.

For more information, please contact the Meeting Committee at gradtravel-w05@cms.math.ca.

Sponsors

Support from the following is gratefully acknowledged. Additional information regarding support for this meeting will be posted to the meeting web site as it becomes available.

- **University of Victoria**
- **le Centre de Recherches Mathématiques**
- **The Fields Institute**
- **MITACS**
- **Pacific Institute for the Mathematical Sciences**
- **Simon Fraser University**
- **Department of Mathematics and Statistics**

The Canadian Mathematical Society wishes to acknowledge the contributions of the Meeting Committee.

SESSIONS

By invitation of the Meeting Committee, there will be sessions in the following areas. The list of speakers is preliminary, and participants interested in delivering a talk in one of the sessions should contact one of the organizers of that session.

Applied Partial Differential Equations

Équations différentielles appliquées

Org: Anne Bourlioux (Montreal), Reinhard Illner, Boualem Khouider (Victoria)

Joe Biello (NYU), Anne Bourlioux (Montreal), Walter Craig (McMaster), Markos Katsoulakis (Massachusetts, USA), Nicolas Kevlahan (McMaster), Boualem Khouider (Victoria), Randy Leveque (Washington, USA), Adam Monahan (Victoria), Adam Oberman (SFU), Vladislav Panferov (McMaster), Olivier Pau-luis (NYU), Francis Poulin (Waterloo), Steven Ruuth (SFU), John Scinocca (CCCma; Victoria), Amik St Cyr (NCAR, USA), Agnes Tourin (McMaster), Vitali Vougalter (Notre Dame, USA)

Combinatorics

Combinatoire

Org: Peter Dukes, Frank Ruskey (Victoria)

Karoly Bezdek (Calgary), Ilya Bluskov (UNBC), Aiden Bruen (Calgary), Sylvie Corteel (CNRS, Université de Versailles, France), Jonathan Jedwab (SFU), Hadi Kharaghani (Lethbridge), Pierre Leroux (UQAM), Petr Liso-nek (SFU), Eric Mendelsohn (Toronto), Marni Mishna (SFU,), Daniel Panario (Carleton), Carla Savage (North Carolina State, USA), Jozsef Solymosi (UBC), Brett Stevens (Carleton), Stephanie van Willigenburg (UBC)

Discrete and Convex Geometry

Géométrie discrète et convexe

Org: Karoly Bezdek, Jozsef Solymosi (Calgary)

Karoly Bezdek (Calgary), Ted Bisztriczky (Calgary), Aiden Bruen (Calgary), Fan Chung Graham (California - San Diego, USA), Thomas Hales (Pittsburgh, USA), Alex Iosevich (Missouri, USA), David Kirkpatrick (UBC), Izabella Laba (UBC), Zsolt Lanyi (Calgary), Marton Naszodi (Calgary), Janos Pach (Courant Inst., NYU, USA), Subhash Suri (California - Santa Barbara, USA), Gabor Tardos (SFU), Csaba Toth (MIT, USA), Catherine Yan (Texas A&M, USA)

Ergodic Theory

Théorie ergodique

Org: Christopher Bose (Victoria), Andres del Junco (Toronto)

Wael Bahsoun (Victoria), Stanley Eigen (Northeastern, USA), Sebastian Ferrando (Ryerson), Adam Fieldsteel (Wesleyan), Thierry Giordano (Ottawa), Guangyue Han (UBC), Mike Keane (Wesleyan, USA), Randall McCutcheon (Ohio State, USA), Vladimir Pestov (Ottawa), Marcus Pivato (Trent),

À l'invitation du comité de coordination, des sessions sont prévues dans les domaines ci-dessous. La liste de conférenciers est préliminaire, et l'on demande à toute personne intéressée à présenter une communication dans l'une des sessions de contacter l'un des organisateurs de la session en question.

Ergodic Theory *continued*

Théorie ergodique suite

Ian Putnam (Victoria), Anthony Quas (Victoria), Joe Rosen-blatt (Illinois - Urbana-Champaign, USA), Dan Rudolph (Colorado State - Fort Collins, USA), Ayse Sahin (DePaul, USA), Cesar Silva (Williams College, USA), Susan Wil-liams (South Alabama, USA), Reem Yassawi (Trent)

Graph Theory

Théorie des graphes

Org: Jing Huang, Kieka Mynhardt, Wendy Myrvold (Victoria)

Richard Anstee (UBC), Anthony Bonato (Wilfrid Laurier), Rick Brewster (Thompson Rivers), Kathie Cameron (Wilfrid Laurier), Stephen Finbow (Saint Francis Xavier), Shannon Fitzpatrick (UPEI), Patrick Fowler (Exeter; Sheffield, UK), Luis Goddyn (SFU), Gena Hahn (Montreal), Bert Hartnell (Saint Mary's), Nora Hartsfield (Western Washington, USA), Chinh Hoang (Wilfrid Laurier), Peter Horak (Washington, USA), Brad Jackson (San Jose State), Bill Kocay (Manitoba), Benoit Larose (Concordia), Jim Liu (Lethbridge), Wendy Myrvold (Victoria), Ortrud Oellermann (Winnipeg), David Pike (Memorial), Mateja Sajna (Ottawa), Jozsef Solymosi (UBC), Ladislav Stacho (SFU)

History of Mathematics

Histoire des mathématiques

Org: Len Berggren (SFU)

Life Beyond Calculus

Au-delà du calcul infinitésimal

Org: Małgorzata Dubiel, Veselin Jungic (SFU)

Mathematics Inspired by Biological Models

Mathématiques inspirées par des modèles biologiques

Org: Fred Brauer (UBC), Pauline van den Driessche (Victoria)

Caroline Bampfylde (Alberta), Daniel Coombs (UBC), Tomas de-Camino-Beck (Alberta), Sylvie Desjardins (UBC Okanagan), Rod Edwards (Victoria), Meredith Greer (Bates College, USA), Abba Gumel (Manitoba), Thomas Hillen (Alberta), Lev Idels (Malaspina University-College), Leah Keshet (UBC), Mark Lewis (Alberta), Kristin Swanson (Washington, USA), Rebecca Tyson (UBC Okanagan), Lin Wang (Victo-ria; UBC), James Watmough (UNB), Jianhong Wu (York)

SESSIONS

Matrix Analysis

Analyse matricielle

Org: Man-Duen Choi (Toronto), Douglas Farenick (Regina)

Tsuyoshi Ando (Hokkaido, Japan), Paul Binding (Calgary), Man-Duen Choi (Toronto), Shaun Fallat (Regina), Doug Farenick (Regina), Peter Gibson (York), David Kribs (Guelph), Peter Lancaster (Calgary), Chi-Kwong Li (William; Mary), Leo Livshits (Colby), Steve Kirkland (Regina), Matjaz Omladic (Ljubljana, Slovenia), Rajesh Pereira (Saskatchewan), Heydar Radjavi (Waterloo), Peter Rosenthal (Toronto), Peter Semrl (Ljubljana, Slovenia), Michael Tsatsomeros (Washington State, USA)

Nonlinear Analysis

Analyse non-linéaire

Org: Martial Aguech (Victoria), Ivar Ekeland (PIMS), Robert McCann (Toronto)

Rustum Choksi (SFU), Richard Froese (UBC), Stephen Gustafson (UBC), Aram Karakhanyan (Australian National University), Truyen Nguyen (MSRI, USA), Adam Oberman (SFU), Gunther Uhlmann (Washington, USA), Michael Ward (UBC)

Operator Algebras

Algèbres d'opérateurs

Org: Marcelo Laca, John Phillips (Victoria)

Beatriz Abadie (Montevideo, Uruguay), Berndt Brenken (Calgary), Ken Davidson (Waterloo), George Elliott (Toronto), Heath Emerson (Victoria), Thierry Giordano (Ottawa), Daniel Goncalves (Victoria), David Kerr (Tokyo, Japan), Masoud Khalkhali (Western), Hanfeng Li (Illinois - Urbana, USA), Huaxin Lin (Oregon, USA), Jamie Mingo (Queen's), Assad Niknam (Mashad, Iran), Ian Putnam (Victoria)

Probability

Probabilité

Org: Martin Barlow, Edwin Perkins (UBC)

Omer Angel (UBC), Antal Jarai (Carleton), Richard Kenyon (UBC), Mike Kozdron (Regina), Vlada Limic (UBC), Bruce Reed (McGill), Tom Salisbury (York), Chris Soteros (Saskatchewan), Balint Virág (Toronto)

Topology

Topologie

Org: Dale Rolfsen (UBC)

Alejandro Adem (UBC), Kristine Bauer (Calgary), Jens von Bergmann (Calgary), Steven Boyer (UQAM), Olivier Collin (UQAM), David Gay (Cape Town, South Africa), Izak Grguric (UBC), Ian Hambleton (McMaster), Gabriel Indurakis (UQAM), Rick Jardine (Western), Richard Kane (Western), Robion Kirby (California - Berkeley), Elena Kudryavtseva (Calgary), Kee Lam (UBC), Victor Nunez (CIMAT, Guanajuato, Mexico), George Peschke (Alberta), Dale Rolfsen (UBC), Laura Scull (UBC), Donald Stanley (Regina), Genevieve Walsh (Texas, USA), Peter Zvengrowski (Calgary)

Variational Analysis and Optimization

Analyse variationnelle et optimisation

Org: Jane Ye (Victoria)

Miguel Anjos (Waterloo), Didier Aussel (Perpignan, France), Heinz Bauschke (Guelph; UBC Okanagan), Jim Burke (Washington, USA), Rick Caron (Windsor), Thomas Coleman (Waterloo), John Dennis (Rice, USA), Yiran He (Chinese University of Hong Kong), Adrain Lewis (Cornell; SFU), Yuying Li (Cornell), Philip Loewen (UBC), Yves Lucet (UBC Okanagan), Jong-Shi Pang (Rensselaer Polytechnic Inst., USA), Jiming Pang (McMaster), Hristo Sendov (Guelph), Mohamed Tawhid (Thompson Rivers), Paul Tseng (Washington, USA), Bingwu Wang (Eastern Michigan, USA), Xianfu Wang (UBC Okanagan), Herre Wiersma (Dalhousie), Henry Wolkowicz (Waterloo), Vera Zeidan (Michigan State, USA), Qiji Jim Zhu (Western Michigan, USA)

Contributed Papers

Communications libres

Org: C. Robert Miers (Victoria)



**CMS Winter
2005 Meeting**

**Réunion d'hiver
2005 de la SMC**

October 31

31 octobre

RÉUNION D'HIVER 2005 de la SMC - VICTORIA, C.-B.

du 10 au 12 DÉCEMBRE, 2005
HÔTE: UNIVERSITÉ DE VICTORIA
Centre De Conférences Victoria

Au nom de l'Université de Victoria, le Département de mathématiques et de statistique invite la communauté mathématique à la Réunion d'hiver 2005 de la Société mathématique du Canada (SMC).

Conformément au format habituel, la Réunion d'hiver comprendra une grande diversité de symposiums, une session de communications libres, des conférences principales, des conférences de lauréats ainsi qu'une conférence populaire.

Toutes les activités, y compris celles du programme scientifique, se dérouleront au Centre de conférence de Victoria et à l'hôtel Empress.

Vous trouverez l'information la plus récente sur le programme ainsi que les horaires détaillés, les formulaires d'inscription et les formulaires d'envoi électronique des résumés sur le site de la Réunion au www.cms.math.ca/Events.

Prix

Prix Coxeter-James	Robert McCann (Toronto)
Prix de doctorat	Vasilisa Shramchenko (Concordia)
Prix Adrien-Pouliot	à déterminer
Prix pour service méritoire	à déterminer
Prix G. de B. Robinson	à déterminer

Conférences plénières

Uffe Haagerup (South Denmark)
Robert Guralnick (Southern California)
Bryna Kra (Northwestern)
Andrew Majda (Institut Courant, New York)
Oded Schram (Microsoft)

Communications libres

Org. : C. Robert Miers (Victoria)

Nous lançons un appel de communications libres de 20 minutes chacune. Un maximum de 20 communications libres seront acceptées.

Les résumés devront nous parvenir au plus tard le 10 octobre 2005, accompagnés du formulaire et des droits d'inscription du conférencier. Pour faciliter la tâche des organisateurs, veuillez indiquer la classification de sujet de l'AMS (www.ams.org/msc) et préciser que vous souhaitez présenter une communication libre.

Séances de travail

La SMC tiendra les séances de travail suivantes :
Comité exécutif : le jeudi 8 décembre
Lunch du groupe de développement : le vendredi 9 décembre
Conseil d'administration : le vendredi 9 décembre

Activités sociales

La SMC tiendra les activités sociales suivantes :
Réception d'accueil : le vendredi 9 décembre
Banquet : le dimanche 11 décembre
Du café et des jus seront servis durant les pauses prévues à l'horaire.

Exposition

Les exposants tiendront kiosque de 9 h 30 à 16 h les 10 et 11 décembre au Foyer du Centre de conférence de Victoria.

Exposition conjointe : On y présentera des produits de maisons d'édition et d'autres entreprises et organismes non représentés à la Réunion. On trouvera des bons de commande sur place, que la Société transmettra aux entreprises concernées après la Réunion. Les livres et autres produits qui seront présentés à cette exposition seront offerts à l'université hôte.

Nous vous invitons à visiter le comptoir d'adhésion et l'exposition de livres de la SMC au foyer du Centre de conférence. Un représentant sera sur place de 9 h 30 à 17 h les 10 et 11 décembre, et de 9 h 30 à 16 h le 12 décembre pour fournir des renseignements sur l'adhésion, les publications et les autres activités de la Société.

À la demande de nos membres, un kiosque de renseignements sera aménagé dans l'aire d'inscription. Prière de faire parvenir une copie de votre annonce à la coordinatrice des Réunions de la SMC au 577, ave. King-Edward, Ottawa (Ontario), Canada K1N 6N5, fax : (613) 565-1539, reunions@smc.math.ca.

Toute annonce doit être approuvée au préalable. Les participants pourront apporter jusqu'à 100 copies de leur annonce approuvée. Il leur incombe de fournir eux-mêmes les copies et de récupérer celles qui seront restées sur la table avant 15 h le dernier jour de la Réunion; autrement, elles seront détruites.

Il est interdit d'afficher des annonces dans l'aire d'inscription ou dans les salles de réunion, ou de distribuer des annonces aux passants. Les annonces d'événements entrant en conflit avec le programme de la Réunion ne seront pas acceptées.

Le kiosque n'est pas destiné à promouvoir des biens et services achetables. Ceux qui désirent faire la promotion de tels produits doivent communiquer avec la coordinatrice des expositions pour obtenir des renseignements sur l'exposition conjointe.

RÉUNION D'HIVER 2005 de la SMC

Envoi de résumés

Pour pouvoir publier votre résumé en ligne et dans le programme de la Réunion, nous devons le recevoir au plus tard le 10 octobre 2005. Veuillez utiliser le formulaire électronique au www.cms.math.ca/forms/abs-w05. Les organisateurs remercient les conférenciers de bien vouloir respecter cette importante échéance.

Veuillez envoyer les résumés de communication libre à cp-abstracts-w05@cms.math.ca. Dans votre courriel, indiquez le nom du conférencier, son affiliation, son adresse de courriel, la classification de sujet de l'AMS (www.ams.org/msc), le titre de la communication et le résumé (en LaTeX si possible).

Inscription

Vous pourrez vous procurer le formulaire d'inscription au www.smc.math.ca/Events ou au :

Bureau administratif de la SMC
577, ave. King-Edward, Ottawa (Ontario) CANADA K1N 6N5
Tél. : 613-562-5702 Fax : 613-565-1539 office@cms.math.ca

Vous pouvez payer par chèque, VISA ou MasterCard. Les paiements en devises américaines seront acceptés, mais nous vous demandons de contacter votre institution financière pour prendre connaissance du taux de change en vigueur. Dans le tableau, les prix sont indiqués en dollars canadiens.

Le paiement doit nous parvenir à Ottawa au plus tard le **31 octobre** pour que vous ayez droit aux tarifs réduits. Pour que votre inscription soit traitée avant la Réunion, votre paiement doit nous parvenir au plus tard le **30 novembre**. Les reçus seront remis à la Réunion.

	Prix réduit	Prix régulier
Conférences plénières/lauréats/populaire	0 \$	0 \$
Organisateurs	200 \$	265 \$
Conférenciers (sessions)	225 \$	295 \$
Non-membres (adhésion à la SMC comprise)	373 \$	443 \$
Membres SMC/AMS/MAA	225 \$	295 \$
Frais d'une journée (sur place seulement)	n/a	195 \$
Postdoc/étudiant/retraité/sans-emploi	100 \$	130 \$
Enseignants (mat-12 ^e , cégep, collège)	100 \$	130 \$
Banquet (gratuit pour conf. pléniers et lauréats)	60 \$	60 \$

AMS = American Mathematical Society

MAA = Mathematical Association of America

À quoi sert de s'inscrire à l'avance?

Quelques avantages de la préinscription : Vous avez droit à un prix réduit si vous vous inscrivez avant le 1er novembre

- Votre nom figurera dans la liste des participants sur le site de la Réunion
- Votre trousse d'inscription sera déjà prête à votre arrivée le vendredi soir

- Vous n'aurez pas besoin de faire la file pour vous inscrire à la première heure samedi matin!
- Les billets pour le banquet sont en vente maintenant, mais il pourrait ne plus en rester sur place

Pour toutes ces raisons, nous vous incitons à vous inscrire tôt, que ce soit avant ou après la date limite d'inscription à prix réduit.

Politique de remboursement

Les participants qui désirent annuler leur inscription doivent en aviser le bureau administratif de la SMC par écrit avant le 30 novembre pour se voir rembourser leurs frais d'inscription (moins 40 \$). Les participants dont les communications libres n'auront pas été acceptées seront remboursés intégralement sur demande.

Êtes-vous admissible à une adhésion gratuite à la SMC?

Les membres de l'AMS et de la MAA qui s'inscrivent à une Réunion semestrielle de la SMC et qui ne sont pas membres de la SMC sont admissibles à une année d'adhésion gratuite à la SMC (offre unique).

Si vous êtes admissible, présentez-vous au kiosque de la SMC pour remplir une demande d'adhésion. Veuillez fournir une preuve d'adhésion à l'AMS ou à la MAA. Cette offre est destinée aux nouveaux membres seulement.

Les participants qui s'inscrivent comme non-membres recevront une adhésion gratuite d'un an à la SMC.

Hébergement

Nous recommandons fortement aux participants de réserver à l'avance. Tous les participants doivent faire leurs propres réservations. Des chambres ont été retenues aux endroits ci-dessous jusqu'aux dates précisées. Après cette date, les hôtels ne prendront vos réservations que s'il reste des chambres et demanderont les tarifs affichés. Les tarifs sont par nuit, par personne, et sont indiqués en devises canadiennes. Les tarifs préférentiels s'appliquent généralement aux trois jours qui précèdent et qui suivent la Réunion. Au moment de réserver, veuillez donner le code de groupe. Toute réservation doit être garantie par le paiement d'une nuit ou par une carte de crédit reconnue.

Au moment de faire votre réservation, n'oubliez pas de vérifier les modalités de paiement et d'annulation, car celles-ci varient d'un établissement à l'autre. Demandez un numéro de confirmation pour toute communication ultérieure.

Nous publierons sur le site de la Réunion tout nouveau renseignement concernant l'hébergement dès que nous le recevrons.

Fairmont Empress

Réserver au plus tard le 8 novembre 2005

Code de l'hôtel : MATHS; code promotion : GRCMS1
721 Government Street, Victoria (C.-B.) Canada V8W 1W5
Taxes : 7 % TPS, 10 % taxe provinciale

RÉUNION D'HIVER 2005 de la SMC

Téléphone : 250-384-8111, sans frais : 1-800-866-5577

Fax : 250-389-2747

Courriel : theempress@fairmont.com

Stationnement : 22 \$ la nuit sans service voiturier (laissez-passer à la réception), 25 \$ la nuit avec service voiturier

Tarifs (une ou deux personnes) :

Chambre Fairmont – 125 \$; Fairmont de luxe – 165 \$; de luxe avec vue sur le port – 205 \$

Suites à partir de 225 \$ 10 chambres économiques – 80 \$

30 \$ la nuit par personne additionnelle, 4 personnes par chambre maximum.

Aucuns frais pour les enfants de moins de 18 ans qui partagent la chambre de leurs parents; repas à prix réduit pour les enfants.

Executive House

Réserver au plus tard le 6 novembre 2005

Code de groupe : Canadian Mathematical Society/Société mathématique du Canada

777 Douglas Street, Victoria (C.-B.) Canada V8W 2B5

Taxes : 7 % TPS, 10 % taxe provinciale

Téléphone : 250-388-5111; sans frais : 1-800-663-7001

Fax : 250-385-1323

Courriel : reservations@executivehouse.com

Stationnement : 2 \$ la nuit, selon la disponibilité

Tarifs (une ou deux personnes) :

Chambres individuelles – 75 \$; Suites avec une chambre à coucher – 90 \$ 15 \$ la nuit par personne additionnelle, aucun frais pour les enfants 16 ans et moins qui partagent la chambre de leurs parents.

Services de garde

Des renseignements sur les services de garde seront sans doute fournis par les hôtels prévus pour la Réunion.

Nous vous recommandons de faire vos démarches et vos réservations à l'avance. Veuillez communiquer directement avec les hôtels si vous avez des questions.

Déplacements

La compagnie AKAL Airport Shuttle offre un service de navette de l'aéroport au centre-ville aux demi-heures durant le jour et après tous les vols durant la nuit. Il est possible de prendre la navette à partir de l'hôtel, sur réservation. Communiquez avec AKAL Airport Shuttle au (250) 386-2525 pour de plus amples renseignements, en mentionnant que vous participez à la Réunion de la SMC; vous aurez ainsi droit à un tarif de groupe spécial de 10 \$ par personne à l'aller et au retour. Le trajet en taxi de l'aéroport au centre-ville coûte environ 45 \$. Ce tarif s'applique dans les cas où au moins trois participants à la Réunion prennent la navette en même temps

Budget Rent-A-Car de Victoria (www.budgetvictoria.com) offre des voitures, des camions, des camionnettes et des voitures de luxe à un tarif réduit pour les participants à la Réunion. La compagnie a des bureaux dans la zone des arrivées ainsi qu'au 757, rue Douglas (en face du Centre de conférence de Victoria). Pour de plus amples renseignements,

communiquez avec Budget au (250) 953-5300, par fax au (250) 953-5250 ou par courriel à reserve@budgetvictoria.com

Vous trouverez des renseignements détaillés concernant l'Université de Victoria, la ville de Victoria et la Colombie-Britannique (renseignements touristiques, température et climat locaux, cartes de la ville et des attractions touristiques, circuits touristiques piétonniers, etc.) sur les sites web suivants :

- Université de Victoria (www.uvic.ca/index.html)
- Tourism Victoria (www.tourismvictoria.com)
- Travel BC (www.travel.bc.ca)
- Service météorologique du Canada (http://weatheroffice.ec.gc.ca/canada_f.html)

Subventions pour étudiants diplômés

Les étudiants diplômés du Canada ou de l'étranger ont accès à un fonds limité pour financer une partie de leurs frais de déplacement et de séjour. La préférence est toutefois accordée aux étudiants canadiens. Toute demande de financement doit être accompagnée d'une lettre du superviseur de l'étudiant ou de la personne responsable des études supérieures de son département, dans laquelle il ou elle indiquera le nom de l'étudiant, son domaine et son niveau d'études, en quoi la Réunion sera profitable à l'étudiant, si l'étudiant présentera une communication et si l'étudiant a accès à d'autres sources de financement.

Faites parvenir votre lettre avant le 10 octobre 2005 à gradtravel-w05@cms.math.ca. Les décisions seront annoncées au début de novembre.

Si une subvention est accordée à l'étudiant, ce dernier se verra rembourser ses dépenses après la Réunion sur présentation du formulaire de remboursement approprié accompagné des reçus originaux.

Pour de plus amples renseignements, veuillez communiquer avec le comité de coordination (gradtravel-w05@cms.math.ca).

Commandites

Nous remercions les organismes ci-dessous de leur soutien financier. Nous publierons de plus amples renseignements sur le financement de la Réunion dès qu'ils nous parviendront.

- **L'Université de Victoria**
- **Le Centre de recherches mathématiques**
- **L'Institut Fields**
- **MITACS**
- **L'Institut Pacific**
- **Le Département de mathématiques et de statistique de l'Université Simon Fraser**

La Société mathématique du Canada tient à remercier les membres du Comité de coordination pour l'organisation de cette Réunion. RIGHT HERE NAT

REGISTRATION FORM – CMS WINTER 2005 MEETING

www.cms.math.ca/events/winter05

CMS ID	<input type="checkbox"/> DR. <input type="checkbox"/> PROF. <input type="checkbox"/> MS. <input type="checkbox"/> MRS. <input type="checkbox"/> MR.	DESIGNATION <input type="checkbox"/> Plenary/Prize/Public Speaker <input type="checkbox"/> Organizer <input type="checkbox"/> Participant <input type="checkbox"/> Session Speaker, Specify Session _____	ACCOMMODATION <input type="checkbox"/> The Fairmont Empress <input type="checkbox"/> Executive House <input type="checkbox"/> Other <input type="checkbox"/> Not Required	
LAST NAME				
FIRST NAME				
INSTITUTION (FOR NAME TAG)				
BUSINESS ADDRESS	MEMBERSHIP <input type="checkbox"/> CMS <input type="checkbox"/> AMS <input type="checkbox"/> MAA			
BUSINESS ADDRESS	<input type="checkbox"/> Provincial Ass'n _____ <input type="checkbox"/> School Board _____ <input type="checkbox"/> Other _____			
CITY				
PROV/STATE	POSTAL/ZIP CODE	SPECIAL DIET <input type="checkbox"/> Kosher <input type="checkbox"/> Vegetarian <input type="checkbox"/> Diabetic <input type="checkbox"/> Low Fat <input type="checkbox"/> Milk Allergy <input type="checkbox"/> Nut Allergy <input type="checkbox"/> Other _____		
COUNTRY				
TELEPHONE	PROFESSION <input type="checkbox"/> University Professor <input type="checkbox"/> College/CEGEP Teacher <input type="checkbox"/> School Teacher <input type="checkbox"/> Public Sector <input type="checkbox"/> Private Sector <input type="checkbox"/> Undergraduate Student <input type="checkbox"/> Graduate Student <input type="checkbox"/> Postdoc <input type="checkbox"/> Retired <input type="checkbox"/> Other			
EMAIL	ARRIVAL DATE			
I AGREE TO HAVE MY NAME APPEAR IN THE PARTICIPANTS LIST ON THE CMS MEETING WEBSITE	<input type="checkbox"/> YES	<input type="checkbox"/> NO	DEPARTURE DATE	
I WOULD LIKE TO DELIVER A CONTRIBUTED PAPER	<input type="checkbox"/> YES	<input type="checkbox"/> NO	VOLUNTARY INFORMATION <input type="checkbox"/> MALE <input type="checkbox"/> FEMALE	
Deadline for registration fees and abstract is October 10, 2005. Abstracts will not be considered unless registration fee is paid.				
I WILL BE ATTENDING THE FOLLOWING SESSIONS <input type="checkbox"/> Applied Partial Differential Equations <input type="checkbox"/> Combinatorics <input type="checkbox"/> Discrete and Convex Geometry <input type="checkbox"/> Ergodic Theory <input type="checkbox"/> Graph Theory <input type="checkbox"/> History of Mathematics <input type="checkbox"/> Life beyond Calculus <input type="checkbox"/> Matrix Analysis <input type="checkbox"/> Mathematics Inspired by Biological Models <input type="checkbox"/> Nonlinear Analysis <input type="checkbox"/> Operator Algebras <input type="checkbox"/> Probability <input type="checkbox"/> Topology <input type="checkbox"/> Variational Analysis and Optimization <input type="checkbox"/> Contributed Papers				

FEES SHOULD MORE THAN ONE CATEGORY APPLY, PLEASE CHOOSE THE LOWER FEE.				
EARLY FEE	REGULAR FEE	DEADLINES	Early registration Pre-registration Cancellation (less \$40 admin fee)	October 31 November 30 November 30
<input type="checkbox"/> Plenary/Public Lecturer (1 free banquet ticket)	\$ 0	\$ 0	CHEQUES PAYABLE TO THE CANADIAN MATHEMATICAL SOCIETY	
<input type="checkbox"/> Prize Lecturer (2 free banquet tickets)	\$ 0	\$ 0		
<input type="checkbox"/> Organizer	\$ 200	\$ 265		
<input type="checkbox"/> Session Speaker	\$ 225	\$ 295		
<input type="checkbox"/> Non-Member (fee includes CMS Membership)	\$ 373	\$ 443		
<input type="checkbox"/> Member CMS/AMS/MAA	\$ 225	\$ 295		
<input type="checkbox"/> One-Day Fee (onsite only)		\$ 195		
<input type="checkbox"/> Postdoc/Student/Retired/Unemployed	\$ 100	\$ 130		
<input type="checkbox"/> Teacher (K-12, CEGEP, College)	\$ 100	\$ 130		
<input type="checkbox"/> Banquet _____ X	\$ 60	\$ 60		
REGISTRATION \$ _____ + BANQUET \$ _____ = TOTAL \$ _____			CREDIT CARD PAYMENT <input type="checkbox"/> VISA <input type="checkbox"/> <input type="checkbox"/> MASTERCARD <input type="checkbox"/>	
		CARD NUMBER _____		
		EXPIRY DATE _____		
		CARDHOLDER NAME _____		
		SIGNATURE _____		FORM MUST BE SIGNED BY CARDHOLDER

PLEASE SEND YOUR COMPLETE FORM WITH PAYMENT TO: CMS, 577 KING EDWARD AVE., OTTAWA, ON CANADA K1N 6N5
FAX: 613-565-1539 (FOR CREDIT CARD PAYMENTS ONLY)

FORMULAIRE D'INSCRIPTION – RÉUNION D'HIVER 2005 DE LA SMC

www.smc.math.ca/reunions/hiver05

N° SMC	<input type="checkbox"/> M ^{me} <input type="checkbox"/> M.	STATUT <input type="checkbox"/> Conf. principal/primé/populaire <input type="checkbox"/> Organisateur <input type="checkbox"/> Participant <input type="checkbox"/> Conférencier (précisez la session) <hr/>	HÉBERGEMENT <input type="checkbox"/> The Fairmont Express <input type="checkbox"/> Executive House <input type="checkbox"/> Autre <input type="checkbox"/> Pas nécessaire
NOM			
PRÉNOM			
ÉTABLISSEMENT (POUR LE BADGE)			
ADRESSE POSTALE (TRAVAIL)			
ADRESSE POSTALE (TRAVAIL)			
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PROV./ÉTAT	CODE POSTAL		
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COURRIEL			
J'ACCEPTE QUE MON NOM FIGURE DANS LA LISTE DES PARTICIPANTS SUR LE SITE WEB DE LA SMC <input type="checkbox"/> OUI <input type="checkbox"/> NON			
J'AIMERAIS PRÉSENTER UNE COMMUNICATION LIBRE <input type="checkbox"/> OUI <input type="checkbox"/> NON Les droits d'inscription et les résumés doivent nous parvenir au plus tard le 10 octobre 2005. Aucun résumé ne sera évalué avant le règlement des droits d'inscription.			
J'ASSISTERAI AUX SESSIONS SUIVANTES <ul style="list-style-type: none"> <input type="checkbox"/> Équations différentielles appliquées <input type="checkbox"/> Combinatoire <input type="checkbox"/> Géométrie discrète et convexe <input type="checkbox"/> Théorie ergodique <input type="checkbox"/> Théorie des graphes <input type="checkbox"/> Histoire des mathématiques <input type="checkbox"/> Au-delà du calcul <input type="checkbox"/> Analyse matricielle <input type="checkbox"/> Mathématiques inspirées par des modèles biologiques <input type="checkbox"/> Analyse non linéaire <input type="checkbox"/> Algèbres d'opérateurs <input type="checkbox"/> Probabilité <input type="checkbox"/> Topologie <input type="checkbox"/> Analyse variationnelle et optimisation <input type="checkbox"/> Communications libres 			

DROITS	SI VOUS ENTREZ DANS PLUSIEURS CATÉGORIES, VUEILLEZ COCHER LA MOINS CHÈRE.				
		Prix réduit	Prix régulier	DATES LIMITES	Pré-inscription à prix réduit 31 octobre Pré-inscription 30 novembre Annulation, moins 40 \$ de frais 30 novembre
<input type="checkbox"/> Conférencier princ./pop. (1 billet banquet incl.) <input type="checkbox"/> Conférencier primé (2 billets banquet incl.) <input type="checkbox"/> Organisateur <input type="checkbox"/> Conférencier <input type="checkbox"/> Non-membre (adhésion à la SMC comprise) <input type="checkbox"/> Membre SMC/AMS/MAA <input type="checkbox"/> Droits d'une journée (inscription sur place seulement) <input type="checkbox"/> Postdoc/Étudiant/Retraité/Sans-emploi <input type="checkbox"/> Enseignant (mat.-12 ^e , cégep, collège) <input type="checkbox"/> Banquet _____ X		0 \$ 0 \$ 200 \$ 225 \$ 373 \$ 225 \$ 195 \$ 100 \$ 100 \$ 60 \$	0 \$ 0 \$ 265 \$ 295 \$ 443 \$ 295 \$ 130 \$ 130 \$ 60 \$		LIBELLEZ VOTRE CHÈQUE AU NOM DE LA SOCIÉTÉ MATHÉMATIQUE DU CANADA
					PAIEMENT PAR CARTE DE CRÉDIT
					VISA <input type="checkbox"/> MASTERCARD <input type="checkbox"/>
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					TITULAIRE SEULEMENT
INSCRIPTION _____ \$ + BANQUET _____ \$ = TOTAL _____ \$					

VEUILLEZ ENVOYER CE FORMULAIRE ET VOTRE PAIEMENT À: BUREAU DE LA SMC, 577, AVE KING-EDWARD, OTTAWA ON CANADA K1N 6N5
 TÉLÉCOPIEUR : (613) 565-1539 (POUR LES PAIEMENTS PAR CARTE DE CRÉDIT SEULEMENT)

CALL FOR NOMINATIONS - NOMINATING COMMITTEE APPEL DE MISES EN CANDIDATURE - COMITÉ DES MISES EN CANDIDATURE

The term of office of the Chair and one member of the Nominating Committee ends on December 31, 2005. The positions to be filled are as follows:

One vacancy: **Chair**

One vacancy: **Representative for the Western region**

The term of office of the Chair is two years plus an additional two years as a member of the committee for the appropriate region. The term for the other members is four years.

The deadline for submission of candidates is **September 15, 2005**. Names, together with the candidate's agreement to serve, should be sent to the address below.

Les mandats de la présidente et d'un membre du comité des mises en candidature prennent fin le 31 décembre 2005. Les postes à combler sont les suivants:

Un poste : **Président**

Un poste : **Représentant pour la région de l'Ouest**

Le mandat du président est de deux ans plus deux années supplémentaires comme membre du comité pour la région appropriée. Pour les autres membres le mandat est de quatre ans.

L'échéance pour proposer des candidats est le **15 septembre 2005**. Les noms, avec le consentement du candidat, devraient être acheminés à l'adresse ci-dessous.

Dr. Graham Wright, Secretary / Secrétaire
Canadian Mathematical Society / Société mathématique du Canada
577 King Edward
Ottawa, Ontario K1N 6N5

The continuing members will be / Les membres qui continueront sont

Dr. H.E.A. (Eddy) Campbell (Memorial) Ex-officio (President) / d'office (Président)

Dr. Christiane Rousseau (Montréal) Ex-officio (Past-President) / d'office (Présidente-sortante) to/au 2005/06/30

Dr. Jacques Hurtubise (McGill)

Dr. Lisa Jeffrey (Toronto)

Dr. Keith Taylor (Dalhousie)

CALL FOR NOMINATIONS - EDITOR-IN-CHIEF A Taste of Mathematics (ATOM)

APPEL DE MISES EN CANDIDATURE - RÉDACTEUR-EN-CHEF Aime-T-On les Mathématiques (ATOM)

The Publications Committee of the CMS solicits nominations for an Editor-in-Chief for "A Taste of Mathematics" (ATOM). The appointment will be for five years beginning January 1, 2006.

The deadline for the submission of nominations is September 15, 2005. Nominations, containing a curriculum vitae and the candidate's agreement to serve should be sent to the address below.

Le comité des publications de la SMC sollicite des mises en candidature pour un poste de rédacteur-en-chef de "Aime-T-On les Mathématiques" (ATOM). Le mandat sera de cinq ans et débutera le 1^{er} janvier 2006.

L'échéance pour proposer des candidat(e)s est le 15 septembre 2005. Les mises en candidature, accompagnées d'un curriculum vitae ainsi que du consentement du candidat(e), devraient être envoyées à l'adresse ci-dessous.

Dr. Juris Steprans, Chair / Président
CMS Publications Committee / Comité des publications de la SMC
York University
Department of Mathematics
N520 Ross, 4700 Keele Street
Toronto, Ontario M3J 1P3
chair-pubc@cms.math.ca

philosophy; *Automatic Sequences and Related Topics; Combinatorics and Geometry; Complex Variables; Discrete and Computational Geometry; Dynamical Systems; Exploratory Classroom Problems in Calculus; Functional Equations and Their Applications; General Topology and Its Applications; Geometric Topology; History and Philosophy of Mathematics; History of Mathematics from Medieval Islam to Renaissance Europe; Invariant Theory and Differential Geometry; L-Functions and Algebraic Curves; Mathematical Aspects of Quantum Information; Mathematics from Ancient to Modern Times; Mathematics of Actuarial Finance; Mathematics of Computer Algebra and Analysis; Nonlinear Partial Differential Equations; Operator Algebras, Operator Spaces and Harmonic Analysis; Random Graphs and Their Applications; Representation Theory; String Theory and Integrable Systems* and a Contributed Papers session. There was also a workshop organized by NSERC on the preparation of a Discovery Grant application.

The meeting was superbly organized by **Andu Nica** (University of Waterloo) and **Frank Zoritzto** (University of Waterloo) with assistance from the many organizers of the special sessions. I would also like to acknowledge the considerable help from **Kim Gingerich**, **Lis D'Alessio** and **Shonn Martin** (University of Waterloo) as well as the staff from the CMS Executive Office. We are very grateful to this group of hard-working highly organized people for making this meeting such a terrific success. We also owe our many sponsors our thanks as well, particularly the **Faculty of Mathematics at the University of Waterloo**, but also the **Centre de Recherches Mathématiques**; **The Fields Institute**; **MITACS**; **the Pacific Institute for the Mathematical Sciences**; **A.K. Peters**; **the Institute for Quantum Computing (IQC)**; **Springer**; **the University of Guelph**; **Queen's University**, **Department of Mathematics and Statistics**; and the **University of Waterloo, Department of Pure Mathematics**.

I remind you all of our Winter Meeting December 10 - 12, 2005 in Victoria, BC. I look forward to seeing you there.

APPEL DE PROPOSITIONS - CONCOURS DE BOURSES DU FONDS DE DOTATION 2005

La Société mathématique du Canada (SMC) est heureuse d'annoncer la tenue du Concours de bourses du fond de dotation 2005 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 charge 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.

De façon générale, le CABFD favorise 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 leur intention envers cette valeur.

Processus de demande. Le formulaire de demande et gabarits, ainsi que conseils et instructions sont disponible au site de la SMC www.smc.math.ca/Grants/EGC/. Les applications doivent être reçues au plus tard le **30 septembre 2005**.

Le président du comité invite les courriels décrivant votre intérêt au fond dès que possible.

Dr. Karl Dilcher
Président, Comité d'attribution des bourses du fonds de dotation
Société mathématique du Canada
577 King Edward Ottawa, ON K1N 6N5
chair-egc@cms.math.ca

After several difficult years for all investors, our Restricted Investment Fund (Endowment, Mathematical Olympiads, and Designated Activities) show modest increases. The Finance Committee continues to monitor our investment portfolio, and has decided that the present strategy should continue.

We are very concerned, however, about the alarming deficit of \$165,006 in our Operations Fund. About half of this amount was anticipated when the 2004 Budget was set. It was attributable to a loss in periodicals subscription revenue (due to bankruptcy of a subscription agent) as well as a loss of foreign exchange profit (due to the increased value of the Canadian dollar). Now we find that the loss in foreign exchange is even greater than anticipated. Also, there was a large employee severance expense which was not anticipated at the time the budget was adopted.

The Board of Directors has approved that the unrestricted fund deficit will be covered by a transfer of the Endowment Fund (which in many former years has been the recipient of budget surpluses). But the revenue from foreign exchange is unlikely to soon regain its former amounts. Thus we need to find new sources of revenue or significantly reduce our programs.

To that end, the Finance Committee has appointed an Ad-Hoc Committee, chaired by the Treasurer, to seek solutions to the budget deficit problem. The Committee is to report in July 2005, so that its findings can be applied to the 2006 Budget.

Après plusieurs années difficiles pour tous les investisseurs, notre fonds d'investissement affecté (dotation, olympiades mathématiques, activités réservées) affiche une légère hausse. Le comité des finances continue de suivre notre portefeuille et a décidé de poursuivre la stratégie actuelle.

Nous sommes toutefois très inquiets du déficit alarmant – 165 006 \$ - qu'affiche notre budget de fonctionnement. Nous avions prévu un déficit d'à peu près la moitié de ce montant à l'établissement du budget 2004. On avait alors prévu une perte de revenus en abonnement aux périodiques (en raison de la faillite d'un agent des abonnements) ainsi qu'une baisse des profits attribuables au taux de change (à cause de la force du dollar canadien). Nous constatons maintenant que la perte due au taux de change est encore plus imposante que prévu. Une importante indemnité de départ n'avait pas non plus été budgétée au moment de l'adoption du budget. Le conseil d'administration a résolu que le déficit du fonds non restreint soit épargné par un transfert du fonds de dotation (qui a reçu des surplus budgétaires pendant de nombreuses années). Comme on ne s'attend pas à ce que les profits tirés du taux de change reprennent de sitôt leur valeur d'autan, nous devons soit trouver de nouvelles sources de revenus, soit réduire considérablement nos activités.

À cette fin, le comité des finances a formé un comité spécial, présidé par le trésorier de la SMC, qui a pour mandat de résoudre le problème du budget déficitaire. Ce comité doit présenter son rapport en juillet 2005 pour que les solutions puissent être appliquées au budget 2006.

MALASPINA

University-College



Malaspina University-College, located on beautiful Vancouver Island, is a comprehensive post-secondary institution that offers degrees; career, trades and technical diplomas and certificates; and also engages in community education, international education and contract training. Teaching excellence is stressed in all programs, and faculty engage in research and scholarly activities in their fields.

We are accepting applications for the following faculty position:

Mathematics

Comp. 05-4060 closes 1 pm, Oct. 27/05

For full details, please click on **Employment Opportunities** on the Malaspina University-College website www.mala.ca.



WWW.MALA.CA

Nanaimo Campus
900 Fifth Street
Nanaimo, BC V9R 5S5
[56-06-10-1040]

Canada-Mexico Meeting

The Mexican Mathematical Society (Sociedad Matemática Mexicana, SMM) will be hosting the first joint CMS-SMM special session at its annual meeting in Mexico City, on October 25, 2005.

The scheduled events include a plenary lecture by Gordon Slade (UBC) on "Critical Oriented Percolation" as well as invited lectures by Thomas Salisbury (York/Fields, CMS President-Elect) and Alejandro Adem (PIMS Deputy Director). The session will also include lectures by Mexican colleagues.

Further information can be obtained at the official website for SMM: www.smm.org.mx/SMMP/html/

Also at this meeting, CMS representatives will be discussing further interactions with the SMM, including plans for a joint meeting of the two societies.

**Graham Wright
CMS Executive Director**

NEWS FROM DEPARTMENTS

University of New Brunswick Fredericton, NB

Awards/Distinctions: William Chernoff (2005 UNB President's Medal Recipient); Gordon Mason (Honorary Research Professor, awarded 2004, and Professor Emeritus [Math & Stat], awarded at Encaenia Ceremony, May 2005).

University of Calgary Calgary, AB

Promotions: Clifton Cunningham (Associate Professor, July 1, 2005); Christiane Lemieux (Associate Professor, July 1, 2005); Antony Ware (Associate Professor, July 1, 2005)

Retirements: Kok Wah Chang (Professor, Aug. 31, 2005).

Concordia University Montreal, Quebec

Appointments: P. Gaillardetz, (Assistant Professor, Statistics, July 1, 2005)

Promotions: G. Dafni (Associate Professor, June 1, 2005)

Retirements: T.N.Srivastava (Professor, May 31, 2005)

Visitors: L. Chekov, Steklov (Mathematical Institute, Quantum Field Theory, September - December 2005); Z.Hu (Sichuan University, Probability Theory & Mathematical Statistics, November 2004 - October 2005); G.Karadzhov (Bulgarian Academy of Sciences, Nonlinear Partial Differential Equations, September - December 2005); A.McIntyre SUNY (Riemann Surfaces and Teichmuller Theory, September 2005 - May 2006); S.Rukolaine (Ioffe Physico-Technical Institute, Applied Mathematics, September - December 2005).

Other News: New Chairman Yogendra P. Chaubey, June 2005.

Saint Mary's University Halifax, NS

Retirements: Y.P.Singh (Professor, August 2005);

Resignations: Joe MacInnes (Professor, Computing Science, June 30, 2005)

McGill University Montreal, Quebec

Promotions: Vojkan Jaksic (Professor, June 2005); G.P.H.Styan (Emeritus Professor, September 2005).

Appointments: Thomas Wihler (Assistant Professor, Applied mathematics, July 2005).

Retirements: Roger Rigelhof (Associate Professor, August 31, 2005)

Awards/Distinctions: Paul Tupper (Leslie Fox Prize in Numerical Analysis June 2005)

Other News: David Wolfson appointed Chair, June 1, 2005 - May 31, 2008.

University of Manitoba, Winnipeg, Manitoba

Appointments: Julien Arino (Assistant Professor, Mathematical Biology, July 1, 2005); Stéphanie Portet (Assistant Professor, Mathematical Biology, July 1, 2005).

Promotions: Abba B. Gumel (Professor, March 30, 2005)

Retirements: Thomas Holens (Assistant Professor, August 31, 2005)

Resignations: Virginie Charette (Assistant Professor, June 30, 2005)

Death: Diane M. Dowling (Senior Scholar, April 29, 2005).
An obituary appears on page 37.

Awards/Distinctions: George Gratzer (Doctor of Science (honoris causa), La Trobe University, Melbourne Australia, May 2005).

Other news: Having published *Philosophia Mathematica* from 1993 to 2004 for the CSHPM/SCHPM as well as edited it, Robert Thomas has now passed the former task on to professionals at Oxford University Press. He continues as editor.

It is already available through them both on paper and online at www.philmat.oupjournals.org. This arrangement keeps the subscription rates lower than they would otherwise have been.

Memorial University of Newfoundland

St. John's, Newfoundland

Promotions: Serpil Kocabiyik (Professor, September 2005); Xiaoqiang Zhao (Professor, September 2005); Jie Xiao, (Associate Professor, September 2005).

Appointments: Chris Radford (Professor and Head of Department, August 25, 2005, Applied Mathematics); J. Concepcion Loredo-Osti (Assistant Professor, September 1, 2005, Statistics); Zhaozhi Fan (Assistant Professor, September 1, 2005, Statistics)

Visitors: Dr. Ivan Graham (U.K., March 17-April 3, 2005); Dr. Perre Magal (France, April 16-23, 2005); Dr. Jianlong Chen (P.R.China, Feb. 2 - April 2, 2005); Dr. Peter Nickolas (Australia, Sept. 3-30, 2004); Dr. Pedro Asentio (Spain, Sept. 6-12, 2004); Dr. Tom Osbourne (Manitoba, Sept. 6-13, 2004); Dr. Georgi Karadzhov (Bulgaria, Sept. 1-Dec. 31, 2004); Dr. Xiang Liang (P.R. China, Sept. 1, 2004 - Jan. 31, 2005); Dr. Sjur Dikrik Flam (Norway, Sept-December, 2004); Dr. Mingshu Peng (P.R. China, May 17, 2005 - April 30, 2006); Dr. JongJin Kim (South Korea, July 2005 - January 2007); Dr. Andrey Trifonov (Russia, September 2005); Dr. Shengfan Zhou (P.R. China) June 22 - August 31, 2005); Dr. Shiwang Ma (P.R. China, June 15 - August 31, 2005); Dr. Zhong Yi (P.R. China, July 1 - December 31, 2005); Dr. Peixuan Weng (P.R. China, July 27 - October 27, 2005); Dr. Tsiu-Kwen Lee (Taiwan, July 14-31, 2005); Dr. Stefano Maset (Italy, August 1-20, 2005); Dr. Gennady Bocharov, (Sept. 15-22, 2005).

Other News: A third edition of "Discrete Mathematics with Graph Theory", by Edgar Goodaire and Michael Parmenter, a popular text for discrete math and graph theory courses, has just been released, July 2005.



A reminder that the deadline for Research Tools & Instruments (RTI) applications is now October 25, 2005. Check with your university for internal deadlines. For any questions related to RTI or Discovery Grants, contact your Program Officers:

Catherine Podeszinski, 613/992-8101, cmp@nserc.ca - GSC 336 - Pure & Applied Maths A Jennifer Bean, 613/996-6217, jxb@nserc.ca - GSC 337 - Pure & Applied Maths B

CALL FOR PROPOSALS - 2005 ENDOWMENT GRANTS COMPETITION

The Canadian Mathematical Society is pleased to announce the 2005 Endowment Grants Competition to fund projects that contribute to the broader good of the mathematical community. The Endowment Fund is used to fund such projects and the Endowment Grants Committee (EGC) administers the distribution of the grants and adjudicates 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 tends 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.

Application process. Application forms and templates as well as advice and directions are available at the CMS website www.cms.math.ca/Grants/EGC. Proposals must be received no later than **September 30, 2005**.

The Chair of the Endowment Grants Committee invites emails expressing interest in the grant as soon as possible

Dr. Karl Dilcher
Chair, Endowment Grants Committee
Canadian Mathematical Society
577 King Edward
Ottawa, ON K1N 6N5
chair-egc@cms.math.ca

MATHEMATICAL COMPETITION RESULTS

37TH CANADIAN MATHEMATICAL OLYMPIAD (CMO)

Ten students received top honours in the 37th Canadian Mathematical Olympiad (CMO). The CMO, Canada's premier mathematics competition, is organized and administered by the Canadian Mathematical Society (CMS). A total of 75 students from 49 Canadian schools were invited to write the 2005 CMO based upon their performance in the 2004 Canadian Open Mathematics Challenge (COMC) (November 24, 2004), the CMS Correspondence Training Programme and other mathematics competitions. Students had to solve five difficult questions during the three hour 2005 CMO examination held on March 30, 2005.

2005 Prize Winners: The top winners in the 37th Canadian Mathematical Olympiad are:

FIRST PRIZE and the Sun Life Financial Cup goes to **Peng Shi**, Sir John A. MacDonald Collegiate Institute, Agincourt, Ontario. **SECOND PRIZE** goes to **Yang (Richard) Peng**, Vaughan Road Academy, Toronto, Ontario. **THIRD PRIZE** goes to **Yufei Zhao**, Don Mills Collegiate Institute, Don Mills, Ontario. **HONOURABLE MENTIONS** were awarded to: **Boris Braverman**, Sir Winston Churchill High School, Calgary, Alberta; **Elyot**

Grant, Cameron Heights Collegiate Institute, Kitchener, Ontario; **Zheng Guo**, Western Canada High School, Calgary, Alberta; **Oleg Ivrii**, Don Mills Collegiate Institute, Don Mills, Ontario; **Lin Fei**, Don Mills Collegiate Institute, Don Mills, Ontario; **Dong Uk (David) Rhee**, McNally School, Edmonton, Alberta; and **Shaun White**, Vincent Massey Secondary School, Windsor, Ontario.

CMS AWARDS BANQUET, JUNE 14, 2005 AT RENISON COLLEGE (UNIVERSITY OF WATERLOO)

BANQUET DES LAURÉATS DE LA SMC, LE 14 JUIN, 2005 AU COLLÈGE RENISON (UNIVERSITÉ DE WATERLOO)



from left / de la gauche: Sarah Marr (Sun Life Financial), Richard Peng, Peng Shi, Yufei Zhao, Terry Visentin (CMO Committee Chair), Zheng Guo, Elyot Grant, David Rhee, Shaun White and Lin Fei.

37^e OLYMPIADE MATHÉMATIQUE DU CANADA (OMC).

Premier concours de mathématiques en importance au pays, l'OMC est organisée par la Société mathématique du Canada (SMC). Soixantequinze élèves, représentant 49 écoles canadiennes, ont été invités à l'OMC 2005 d'après leurs résultats au dernier Défi ouvert canadien de mathématiques (24 novembre 2004), au programme de formation par correspondance de la SMC et à d'autres concours mathématiques. Les élèves devaient répondre à cinq questions difficiles pendant les trois heures de l'examen, tenu le 30 mars 2005.

Lauréats 2005 - Voici les grands gagnants de la 37e Olympiade mathématique du Canada :

PREMIER PRIX et la coupe La Financière SUN LIFE : **Peng Shi**, Sir John A. MacDonald Collegiate Institute, Agincourt, Ontario. **DEUXIÈME PRIX** : **Yang (Richard) Peng**, Vaughan Road Academy, Toronto, Ontario. **TROISIÈME PRIX** : **Yufei Zhao**, Don Mills Collegiate Institute, Don Mills,

Ontario. **MENTIONS HONORABLES** : **Boris Braverman**, Sir Winston Churchill High School, Calgary, Alberta; **Elyot Grant**, Cameron Heights Collegiate Institute, Kitchener, Ontario; **Zheng Guo**, Western Canada High School, Calgary, Alberta; **Oleg Ivrii**, Don Mills Collegiate Institute, Don Mills, Ontario; **Lin Fei**, Don Mills Collegiate Institute, Don Mills, Ontario; **Dong Uk (David) Rhee**, McNally School, Edmonton, Alberta; **Shaun White**, Vincent Massey Secondary School, Windsor, Ontario.

*The most up-to-date information concerning all mathematical competitions, math camps and other programs, can be found at:
www.cms.math.ca/competitions*

*Vous trouverez l'information la plus récente sur les concours et les camps de mathématiques ainsi que d'autres programmes au :
www.smc.math.ca/concours*

MATHEMATICAL COMPETITIONS RESULTS

CANADA WINS ONE GOLD, TWO SILVER AND TWO BRONZE MEDALS AT THE 46TH MATHEMATICAL OLYMPIAD IN MÉRIDA, MEXICO.

Competing against students from 90 other countries, Canadian high school students have done extremely well winning one Gold Medal, two silver, and two Bronze Medals at the 46th International Mathematical Olympiad (IMO) Mérida, Mexico, from July 8 -19, 2005.

The six students who competed for Canada were: Lin Fei, Don Mills Collegiate Institute, Toronto (Ontario); Elyot Grant, Cameron Heights Collegiate Institute, Kitchener (Ontario); Yang (Richard) Peng, Vaughan Road Academy, Toronto (Ontario); Dong Uk (David) Rhee, McNally High School, Edmonton (Alberta); Peng Shi, Sir John A. Mac Donald Collegiate Institute, Toronto (Ontario); and Yufei Zhao, Don Mills Collegiate Institute, Toronto (Ontario).

The team was accompanied by the Team Leader, Dr. Felix Recio (University of Toronto), the Deputy Team Leader, Dr. Dorette Pronk (Dalhousie University), and the Deputy Leader Observer, Mr. Adrian Tang (University of Calgary).

Although the closing ceremony, scheduled for July 18th, had to be cancelled due to Hurricane Emily, a **GOLD MEDAL** was awarded to **Yufei Zhao**; **SILVER MEDALS** to **Yang (Richard) Peng** and **Peng Shi**, and **BRONZE MEDALS** to **Elyot Grant** and **Donk Uk (David) Rhee**.



A report on the Canadian Team's participation at the 2005 IMO will be published in a subsequent issue of the CMS NOTES.

LE CANADA REMPORTE UNE MÉDAILLE D'OR, DEUX D'ARGENT ET UNE DE BRONZE À L'OLYMPIADE INTERNATIONALE DE MATHÉMATIQUES 2005 À MÉRIDA, AU MEXIQUE

En compétition avec des élèves de 90 autres pays, une équipe d'élèves canadiens du secondaire a réussi une superbe performance. Elle a en effet remporté une médailles d'or, deux d'argent et deux de bronze à la 46e Olympiade internationale de mathématiques (OIM) tenue à Mérida, au Mexique, du 8 au 19 juillet 2005.

Les six membres de l'équipe canadienne 2005 sont : Lin Fei, Don Mills Collegiate Institute, Toronto (Ontario); Elyot Grant, Cameron Heights Collegiate Institute, Kitchener (Ontario); Yang (Richard) Peng, Vaughan Road Academy, Toronto (Ontario); Dong Uk (David) Rhee, McNally High

School, Edmonton (Alberta); Peng Shi, Sir John A. Mac Donald Collegiate Institute, Toronto (Ontario); and Yufei Zhao, Don Mills Collegiate Institute, Toronto (Ontario).

La cérémonie de remise des médailles du 18 juillet 2005, à Mérida, a été cancellée due à l'ouragan "Emily"; une médaille d'or a été décernée à **Yufei Zhao**; **Yang (Richard) Peng** et **Peng Shi** ont reçu des médailles d'argent ; **Elyot Grant** et **Donk Uk (David) Rhee** pour leur part ont reçus des médailles de bronze.

Un rapport sur la participation de l'équipe canadienne de l'OIM 2005 paraîtra dans un prochain numéro des NOTES de la SMC.

OBITUARY

DIANE MARY DOWLING (NÉE JOHNSON)

February 21, 1933 – April 29, 2005

Diane Dowling was born and raised in Winnipeg, Manitoba, where she attended Balmoral Hall School and United College. Her bachelor's and master's degrees were earned at the University of Manitoba and her Ph.D. at the University of Toronto. In 1958, she joined the Department of Mathematics at the University of Manitoba where she served as a member for 40 years.

Diane's research interests were in the area of combinatorics. Almost half a century ago, she constructed (jointly with A. L. Dulmage and N. S. Mendelsohn) five mutually orthogonal Latin squares of order 12, which to this day remains the largest number ever found for a non prime power order. Her meticulously prepared and clearly delivered lectures won her the respect and affection of her students. In 1980 she became a member of St. Paul's College at the University of Manitoba, and her many contributions to the life of the College earned her the "Father Cecil Ryan Award".

After her retirement in 1998, Diane was appointed a Senior Scholar of the University of Manitoba and she continued her educational activities, always devoted to increasing the interest in mathematical education in the Province of Manitoba. For many years until her passing away she was a member of the Executive of the Manitoba Association of Mathematics Teachers, chaired the Manitoba Mathematical Contest Committee, and also served on curriculum committees for the Department of Education. Her husband Roy Dowling was a close associate in all these outreach activities; the two seemed inseparable, and they received the University of Manitoba "Campbell Outreach Award" in recognition of their work.

Diane had a warm and friendly personality, and she could always be counted upon in times of need. She will be greatly missed by all who had the privilege of knowing her.



MOTIVES AND PERIODS

University of British Columbia, Vancouver

June 5-12, 2006

The conference is intended to cover recent developments in the study of motives and periods with an emphasis to the connections to physics, arithmetic and algebraic cycles. The conference has an instructional component which consists of a series of survey talks. The conference will provide an opportunity for young speakers to present their results.

www.pims.math.ca/science/2006/06motives/



THE UNIVERSITY OF BRITISH COLUMBIA

CALENDAR OF EVENTS / CALENDRIER DES ÉVÉNEMENTS

SEPTEMBER	2005	SEPTEMBRE	
5-9	International Workshop on Functional Analysis (Liege, Belgium) http://www.ulg.ac.be/sectmath/sept05.html		
12-16	p-adic Representations (CRM, Montreal, Quebec) http://www.crm.montreal.ca/Number2005/		
12-16	CASC' 2005 The 8th International Workshop on Computer Algebra in Scientific Computing (Kalamata, Greece) http://www.cargo.wlu.ca/casc2005/		
13-17	Fifth International Conference on Words, CRM (Montreal, Quebec) http://www.crm.umontreal.ca/Number2005/		
26-30	49th Annual meeting of the Australian Mathematical Society (The University of Western Australia, Perth) www.maths.uwa.edu.au/~austms05/		
27-30	Workshop on Graphs, Morphisms and Applications, Centre de Recerca Matematica (Bellaterra, Spain) http://www.crm.es/		
OCTOBER	2005	OCTOBRE	
3-7	2nd Workshop on Tutte Polynomials and Applications, Centre de Recerca Matematica, (Bellaterra, Spain) http://www.crm.es/		
7-9	19th Midwest Conference on Combinatorics, Cryptography and Computing (Rochester Institute of Technology, Rochester, NY) www.math.rit.edu/~cvlsm/MCCCC/		
14-15	Prairie Analysis Seminar 2005 (Kansas State University, Manhatten, KS) www.math.ksu.edu/pas/2005/prarie05-index.html		
17-21	Nonlinear parabolic Problems (Helsinki, Finland) www.math.helsinki.fi/research/FMSvisitor0506		
NOVEMBER	2005	NOVEMBRE	
4-6	Geometric and Probabilistic Methods in Group Theory and Dynamical Systems (Texas A&M University, College Station, TX) www.math.tmu.edu/~sunik/05tamu		
28-Dec.3	International Conference on Operator Algebras and their Connections to Mathematical Physics (University Hassan II, Settat, Morocco) www.math.uni-muenster.de/math/inst/reine/cuntz/icoamp/		
DECEMBER	2005	DÉCEMBRE	
10-12	CMS Winter 2005 Meeting / Réunion d'hiver 2005 de la SMC (University of Victoria) www.cms.math.ca/Events		
12-15	Second International Conference on Technology, Knowledge and Society (Hyderabad, India) www.technology-conference.com		
JANUARY	2006	JANVIER	
3-7	Moduli spaces of knots - AIM Research Conference Center (Palo Alto, CA) www.aimath.org/ARCC/workshops/spaceofknots.html		
30-Feb.3	Mathematics-in-Study Group 2005 (Massey University, Auckland, New Zealand) http://misg2006.massey.ac.nz/		
FEBRUARY	2006	FÉVRIER	
30-Feb.3	The Cacetta-Haggkvist conjecture in Graph Theory - AIM Research Conference Center (Palo Alto, CA) www.aimath.org/ARCC/workshops/cacetta.html		
MARCH	2006	MARS	
13-17	L-functions and Related Themes (CRM, Montreal, Quebec) www.crm.umontreal.ca/Number2005/		
20-24	p-Adic Representations, Modularity, and beyond (AIM Research Conference Center(Palo Alto, CA) www.aimath.org/ARCC/workshops/padicmodularity.html		
APRIL	2006	AVRIL	
6-12	Additive Combinatorics (CRM, Montreal, Quebec) http://www.crm.umontreal.ca/Number2005/		
MAY	2006	MAI	
5-10	Combinatorial and Geometric Group Theory (Vanderbilt University, Nashville, TN) www.math.vanderbilt.edu/~msapir/cggt/cggt.html		
13-18	Analytical Methods for Diophantine Equations (Banff International Research Station, Banff, AB) paradis@crm.umontreal.ca		
17-21	ASL Annual Meeting (Montreal, Quebec) asl@vassar.edu		
JUNE	2006	JUIN	
3-5	CMS Summer 2006 Meeting - University of Calgary www.cms.math.ca/events		
5-12	Motives and Periods, University of British Columbia, Vancouver www.pims.math.ca/scivence/2006/06motives/		
27-Jul 3	International Commission on Mathematical Instruction: Challenging Mathematics in and beyond the Classroom (Trondheim, Norway) www.amt.canberra.edu/icmisi16.html/ , barbeau@math.utoronto.ca		
AUGUST	2006	AOÛT	
2-6	Eighth IMS North American New Researchers Conference (Minneapolis, Minnesota) galin@stat.umn.edu		
12-20	Methods of Integrable Systems in Geometry: An LMS Durham Research Symposium, Satellite to ICM 2006 (University of Durham, UK) www.icm2006.org		
13-19	10th Prague Topological Symposium,International Conference on General Topology and its Relations to Modern Analysis and Algebra (Prague, Czech Republic) topology-news@atlas-conferences.com		
16-19	Trends and Challenges in Calculus of Variations and its applications, Satellite to ICM 2006 (UCLM, Toledo,Spain) www.icm2006.org		
16-19	Algebraic Geometry, Satellite to ICM 2006 (Segovia, Spain) www.icm2006.org		

CALENDAR OF EVENTS / CALENDRIER DES ÉVÉNEMENTS

SEPTEMBER	2006	SEPTEMBER	DECEMBER	2006	DÉCEMBRE
14-17	Conference On Routing And Location 2006 (CORAL 2006), Satellite to ICM 2006 (Puerto de la Cruz, Tenerife) http://www.icm2006.org		9-11	CMS Winter 2006 Meeting - University of Toronto www.cms.math.ca/events , meetings@cms.math.ca	

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www.cms.math.ca/members/

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February / février		December 1 / le 1 décembre	
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October / octobre		August 15 / le 15 août	
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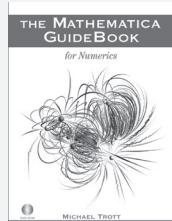
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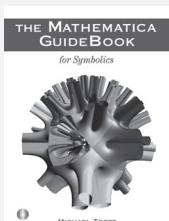
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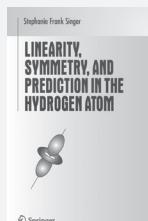
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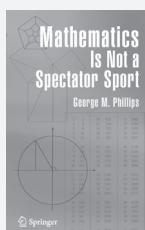


Linearity, Symmetry and Prediction in The Hydrogen Atom

Stephanie F. Singer, Haverford College, Pennsylvania

This text is devoted to making predictions about dimensions of the basic states of a quantum system from only two ingredients: the symmetry and the linear model of quantum mechanics. Known to the mathematicians as representation theory and to the physicists as group theory, this method finds wide applications in crystallography, classification of manifolds with symmetry, atomic structure, and so on.

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George Phillips, University of St. Andrews, Fife, UK

This book is intended for students at the start of their mathematical journey. Topics include early algebraic ideas such as the Euclidean algorithm, geometrical constructions created by the Greeks, and ancient Babylonian and Chinese proofs of the Pythagorean Theorem.

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0-387-25528-1 ► Approx. \$39.95



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Peter Brass, City College, New York; William O.J. Moser, McGill University, Canada; and Janos Pach, New York University

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