

# CMS NOTES de la SMC

Volume 30

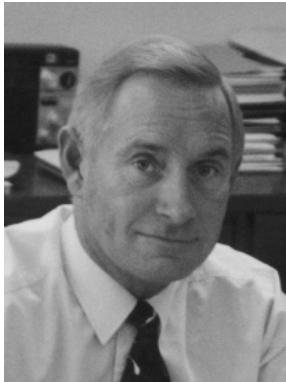
No. 6

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## FROM THE EXECUTIVE DIRECTOR'S DESK



*Graham Wright*

(*voir la page 7 pour la version française*)

In the last issue of the *Notes*, the President, Richard Kane, reported that the Board of Directors had approved an extension of my term as Executive Director until June 30, 2002. I wish to thank all of those involved in the Society's activities for their invaluable support and encouragement over the past 19 years and I look forward to working with many of you over the next four years.

Many diverse and interesting challenges lie ahead and together with the help and support of our many volunteers, both inside and outside the CMS, we will be able to maximize opportunities and actively pursue the Society's goal to promote and advance the

*discovery, learning and application of mathematics.*

The President also reported on the "Planning for the future of the CMS" document that had been endorsed by the Board and on the various task forces that will help "review all aspects of CMS operations". The scope of the Society's operations has grown significantly over the past several years and with this growth has come a corresponding increase in both administrative and financial operations. It is important that all of our activities are administered effectively and efficiently and the mandate of one of the Task Forces will be to review "Office Strategies", for example, workload, staff assignments, conference administration, streamlining and the requirements associated with Camel.

Change will certainly be a significant part of future planning and change is certainly not new for the Executive Office in Ottawa, or for the Society's various editorial offices (St. John's, Halifax, Hamilton, Winnipeg, Burnaby and Vancouver). Indeed, the past six months have already seen some significant changes at the Executive Office.

Several positions have been modified to better reflect current needs and to more clearly identify the responsibilities for each position. Monique Bouchard, who has been with the CMS since 1980, is now the Operations Manager and the other full-time Executive

*(continued on page 6)*

**CMS NOTES**  
**NOTES DE LA SMC**

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**EDITORIAL**



*Peter Fillmore*

Editing and publishing in the mathematical sciences in Canada today is impressively vigorous and extensive, comprising book series and periodicals, both print and electronic. This was brought to light in the document "Mathematics in Canada", prepared last year by Jim Timourian and the CMS International Affairs Committee in connection with the move of Canada's IMU membership to the top category.

To begin with books, there are 8 series in all - two each from the CMS and the Fields Institute, and no less than four from the CRM. With the CMS-Wiley series moving to Springer-Verlag, five of these are distributed by the AMS and three by Springer. To these one might add occasional publications such as the books issued by the CMS in 1995 to mark our 50th anniversary and the 36th IMO.

It appears that some 11 periodicals are published by professional organizations, including the CMS(5), AMQ(2), CAIMS(1), RSC(1), CSHPM(1), and SSC(1). There are another 8 (or more?) speciality journals edited in various Canadian university mathematics departments, led by the Universities of Manitoba and Waterloo with three each. Of these, three are in combinatorics (*Ars Combinatoria*, *J. Combinatorial Theory-Series B*, *J. Algebraic Combinatorics*), and the others on des sujets variés (*Aequationes Math*, *Algebra Universalis*, *Designs Codes and Cryptography*, *Theory and Applications of Categories*, *Utilitas Math*).

Combinatorics) and the balance in varied fields (*Aequationes Math*, *Algebra Universalis*, *Designs Codes and Cryptography*, *Theory and Applications of Categories*, *Utilitas Math*).

The dollar value of all this activity must be large, causing one to wonder if a greater portion of it might be captured for the benefit of the mathematical sciences community. Readers with views on this, or with comments on the above list, are invited to write to us.

Au Canada, l'édition et la publication dans le domaine des sciences mathématiques sont des secteurs étonnamment dynamiques et diversifiés. On publie des collections de livres et de périodiques, en format électronique et papier. C'est ce que nous apprenait le document Mathematics in Canada, rédigé par Jim Timourian et le Comité des affaires internationales de la SMC, en vue du passage du Canada l'échelon supérieur de l'UMI.

Du côté des livres, huit collections sont publiées au pays : deux par la SMC et l'Institut Fields, et quatre par le CRM. Comme la collection SMC-Wiley est passée chez Springer-Verlag, cinq de ces collections sont distribuées par l'AMS et trois par Springer. Ajoutons à cela des ouvrages occasionnels, comme les livres publiés par la SMC à l'occasion de son cinquantième anniversaire et de la 36e OIM.

Quelque onze périodiques sont publiés par des associations professionnelles, notamment la SMC (5), l'AMQ (2), la SCMAI (1), la SRC (1), la SCHPM (1) et la SSC(1). On compte aussi huit revues spécialisées (ou plus) éditées dans les départements de mathématiques de diverses universités canadiennes, les universités du Manitoba et de Waterloo en tête avec trois chacune. De ces onze périodiques, trois portent sur la combinatoire (*Ars Combinatoria*, *J. Combinatorial Theory-Series B*, *J. Algebraic Combinatorics*), et les autres sur des sujets variés (*Aequationes Math*, *Algebra Universalis*, *Designs Codes and Cryptography*, *Theory and Applications of Categories*, *Utilitas Math*).

tography, Theory and Applications of Categories, *Utilitas Math.*)

Les sommes que rapportent toute cette activité sont sans doute considérables, ce qui nous amène à

nous interroger sur la possibilité de conserver une partie de ces profits, pour le bénéfice de la communauté mathématique. Nous invitons les lecteurs à nous donner leur opinion sur

le sujet ou à nous faire part de leurs commentaires sur la liste ci-dessus.

*P. Fillmore*

## FOUR FIELDS MEDALS, NEVANLINNA PRIZE, PLAQUE AWARDED AT ICM'98

In physics or literature they have the Nobel Prize, and in mathematics there is the Fields Medal. This highest scientific award for mathematicians was presented on August 18 at the opening ceremony of ICM'98 in Berlin to Richard E. Borcherds, Maxim Kontsevich, W. Timothy Gowers and Curtis T. McMullen. The International Mathematical Union also awarded the Nevanlinna Prize for outstanding work in the field of theoretical computer science to the mathematician Peter Shor, and a special silver plaque to Andrew Wiles.

The Fields Medal is the highest scientific award for mathematicians. The awards are presented every four years at the International Congress of Mathematicians (ICM) together with a prize of \$15,000 (Canadian). Up to four medals are presented at each ceremony to mathematicians who are not more than forty years old. The age limit is intended to guarantee that not only past work is rewarded. The Fields Medal is also intended to encourage the winners to make further contributions.

The Fields Medal is made of gold, and shows the head of Archimedes (287 - 212 BC) together with a quotation attributed to him: *Transire suum pectus mundoque potiri* (Rise above oneself and grasp the world). The reverse side bears the inscription: *Congregati ex toto orbe mathematici ob scripta insignia tribuere.* (The mathematicians assembled here from all over the world pay tribute for outstanding work).

The Nevanlinna Prize has been awarded since 1983 for outstanding work in the fields of theoretical computer science. The prize is also in the form of a gold medal and a cash

award of \$15,000. It is donated by the University of Helsinki in memory of the Finnish mathematician Rolf Nevanlinna, who was president of the International Mathematical Union 1959 - 1962 and organiser of the World Congress in Stockholm in 1962. One side of the medal shows the bust of Nevanlinna, and the other bears the seal of Helsinki University and a rectangle of noughts and ones, the word "Helsinki" in coded form.

### RICHARD E. BORCHERDS



Richard E. Borcherds received a medal for his work in the fields of algebra and geometry, in particular for his proof of the so-called Moonshine conjecture. This conjecture was formulated at the end of '70s by the British mathematicians John Conway and Simon Norton and presents two mathematical structures in such an unexpected relationship that the experts gave it the name "Moonshine". In 1989, Borcherds was able to cast some more light on the mathematical background of this topic and to produce a proof for the conjecture.

The Moonshine conjecture provides an interrelationship between the

so-called "monster-groups" and elliptic functions. These functions are used in the construction of wire-frame structures in two-dimensions, and can be helpful, for example, in chemistry for the description of molecular structures. Monster groups, in contrast, only seemed to be of importance in pure mathematicians. Groups are mathematical objects which can be used to describe the symmetry of structures. Expressed technically, they are a set of objects for which certain arithmetic rules apply (for example all whole numbers and their sums form a group).

An important theorem of algebra says that all groups, however large and complicated they may seem, all consist of the same components - in the same way as the material world is made up of atomic particles. The "monster group" is the largest "sporadic, finite, simple" group - and one of the most bizarre objects in algebra. It has more elements than there are elementary particles in the universe (approx.  $8 \times 10^{53}$ ). Hence the name "monster".

In his proof, Borcherds uses many ideas of string theory – a surprisingly fruitful way a making theoretical physics useful for mathematical theory. Although still the subject of dispute among physicists, strings offer a way of explaining many of the puzzles surrounding the origins of the universe. They were proposed in the search for a single consistent theory which brings together various partial theories of cosmology. Strings have a length but no other dimension and may be open strings or closed loops.

Richard Ewen Borcherds (born 29 November 1959) has been Royal Soci-

ety Research Professor at the Department of Pure Mathematics and Mathematical Statistics at Cambridge University since 1996. Borcherds began his academic career at Trinity College, Cambridge before going as assistant professor to the University of California in Berkeley. He has been made a Fellow of the Royal Society, and has also held a professorship at Berkeley since 1993.

### MAXIM KONTSEVICH



Maxim Kontsevich has established a reputation in pure mathematics and theoretical physics, with influential ideas and deep insights. He has been influenced by the work of Richard Feynmann and Edward Witten. Kontsevich is an expert in the so-called "string theory" and quantum field theory. He made his name with contributions to four problems of geometry. He was able to prove a conjecture of Witten and demonstrate the mathematical equivalence of two models of so-called quantum gravitation. The quantum theory of gravity is an intermediate step towards a complete unified theory. It harmonises physical theories of the macrocosm (mass attraction) and the microcosm (forces between elementary particles).

Another result of Kontsevich relates to knot theory. Knots mean exactly the same thing for mathematicians as for everyone else, except that the two ends of the rope are always joined together.

A key question in knot theory is, which of the various knots are equivalent?

Or in other words, which knots can be twisted and turned to produce another knot without the use of scissors? This question was raised at the beginning of the 20th century, but it is still unanswered. It is not even clear which knots can be undone, that is converted to a simple loop. Mathematicians are looking for ways of classifying all knots. They would be assigned a number or function, with equivalent knots having the same number. Knots which are not equivalent must have different numbers. However, such a characterisation of knots has not yet been achieved. Kontsevich has found the best "knot invariant" so far. Although knot theory is part of pure mathematics, there seem to be scientific applications. Knot structures occur in cosmology, statistical mechanics and genetics.

Maxim Kontsevich (born 25 August 1964) is Professor at the Institute des Hautes Etudes Scientifiques (I.H.E.S) in France and Visiting Professor at Rutgers University in New Brunswick (USA). After studying at the Moscow University and beginning research at the Institute for Problems of Information Processing, he gained a doctorate at the University of Bonn, Germany in 1992. He then received invitations to Harvard, Princeton, Berkeley and Bonn.

### WILLIAM TIMOTHY GOWERS



Timothy Gowers has provided important contributions to functional analysis, making extensive use of methods from combinatorial theory. These two

fields apparently have little to do with each other, and a significant achievement of Gowers has been to combine them fruitfully. Functional analysis and combinatorial analysis have in common that many of their problems are relatively easy to formulate, but extremely difficult to solve. Gowers has been able to utilise complicated mathematical constructions to prove some of the conjectures of the Polish mathematician Stefan Banach (1892-1945), including the problem of "unconditional bases".

Banach was an eccentric, preferring to spend his time in the café rather than in his office in the University of Lvov. In the twenties and thirties he filled a notebook with problems of functional analysis while sitting in the "Scottish Cafe", so that this later became known as the Scottish Book.

Gowers has made significant contributions above all to the theory of Banach spaces. Banach spaces are sets whose members are not numbers but complicated mathematical objects such as functions or operators. However, in a Banach space it is possible to manipulate these objects like numbers. This finds applications, for example, in quantum physics. A key question for mathematicians and physicists concerns the inner structure of these spaces, and what symmetry they show. Gowers has been able to construct a Banach space which has almost no symmetry. This construction has since served as a suitable counter-example for many conjectures in functional analysis, including the hyperplane problem and the Schroeder-Bernstein problem for Banach spaces.

Gowers' contribution also opened the way to the solution of one of the most famous problems in functional analysis, the so-called "homogeneous space problem". A year ago, Gowers attracted attention in the field of combinatorial analysis when he delivered a new proof for a theorem of the mathematician Emre Szemerédi which is shorter and more elegant than the

original line of argument. Such a feat requires extremely deep mathematical understanding.

William Timothy Gowers (born 20 November 1963) is a Lecturer at the Department of Pure Mathematics and Mathematical Statistics at Cambridge University and Fellow of Trinity College. From October 1998 he will be Rouse Ball Professor of Mathematics. After studying through to the doctorate level at Cambridge, Gowers went to University College London in 1991, staying until the end of 1995. In 1996 he received the Prize of the European Mathematical Society.

### CURTIS T. McMULLEN



Curtis T. McMullen was awarded a medal primarily in recognition of his work in the fields of geometry and "complex dynamics", a branch of the theory of dynamical systems, better known perhaps as chaos theory. McMullen has made contributions in numerous fields of mathematics and fringe areas.

He already provided one important result in his doctoral thesis. The question was how to calculate all the solutions of an arbitrary equation. For simple equations it is possible to obtain the solutions by simple rearrangement. For most equations, however it is necessary to use approximation. One well-known form is the "Newton method" - already known in a rudimentary form in ancient times. For second-degree polynomials this provides very good results without exception. A key ques-

tion therefore was whether a comparable method - which happened not to have been discovered - also existed for equations of higher degrees. Curtis T. McMullen's conclusion was that there is definitely no such universal algorithm for equations above degree three; only a partially applicable method is possible.

For degree-three equations he developed a "new" Newtonian method and could thus completely solve the question of approximation solutions. A further result of McMullen relates to the Mandelbrot set. This set describes dynamical systems which can be used to model complicated natural phenomena such as weather or fluid flow. The point of interest is where a system drifts apart and which points move towards centres of equilibrium. The border between these two extremes is the so-called Julia set, named after the French mathematician Gaston Julia, who laid the foundations for the theory of dynamic systems early in the twentieth century. The Mandelbrot set shows the parameters for which the Julia set is connected, i.e. is mathematically attractive. This description is very crude, but a better characterisation of the boundary set was not available.

Curtis T. McMullen made a major advance, however, when he showed that it is possible to decide in part on the basis of the Mandelbrot set if the associated dynamical system is "hyperbolic" and can therefore be described in more detail. For these systems a well-developed theory is available. McMullen's results were suspected already in the sixties, but nobody had previously been able to prove this exact characterisation of the Julia set.

Curtis T. McMullen (born 21 May 1958) is a Visiting Professor at Harvard University. He studied in Williamstown, Cambridge University and Paris before gaining a doctorate in 1985 at Harvard. He lectured at various universities before becoming Professor at the University of California in Berkeley. Since 1998 he has taught at

Harvard. The Fields Medal is his tenth major award. In 1998 he was elected to the American Academy of Arts and Sciences.

### PETER SHOR (NEVANLINNA PRIZE)



Peter Shor has carried out pioneering work in combinatorial analysis and the theory of quantum computing. He received worldwide recognition in 1994 when he presented a computational method for factorising large numbers which, theoretically, could be used to break many of the coding systems currently employed. The drawback is that Shor's algorithm works on so-called quantum computers, of which only prototypes currently exist. Quantum computers do not operate like conventional ones, but make use of the quantum states of atoms, which offers a computing capacity far in excess of current parallel supercomputers.

Shor's result unleashed a boom in research amongst physicists and computer scientists. Experts predict that quantum computers could become a reality within the next decade, but this rapid development is also a cause of concern for some observers. Shor has been able to prove mathematically that the new computers would mean that current standard encrypting methods such as "RSA", which are used for electronic cash and online signatures would no longer be secure. RSA was developed in 1977 by the mathematicians Ronald Rivest, Adi Shamir and Leonard Adleman (hence the acronym). It makes use of the fact that factorising a number is a so-called

one-way function. This means that while it is very easy to make a large number from smaller ones, it takes much longer to find all the factors of a large number. This time factor is the basis for the security offered by many encryption methods. Using Shor's algorithms, factorising large numbers on a quantum computer would be just as fast as multiplication. RSA and other procedures would no longer be safe. Experts have been making reassuring noises, since a lot of work remains to be done before such computers can even be constructed, but cryptographers are already working on the next generation of encryption techniques.

Peter Shor (born 14 August 1959) is a mathematician at the AT&T Labs in Florham Park, New Jersey. His research interests include quantum computing, algorithmic geometry, and combinatorial analysis. After studying at California Institute of Technology he gained a doctorate at Massachusetts Institute of Technology. Before going to AT&T in 1986, he was a postdoctoral fellow for a year at the Mathematical

Sciences Research Institute in Berkeley, California.

### **ANDREW J. WILES (IMU SILVER PLAQUE)**



The British mathematician Andrew J. Wiles has been honoured with the "IMU silver plaque". The chairman of the Fields Medals Committee, Yuri Manin, presented him with this award during the opening ceremony of ICM'98 in the Berlin International Congress Centre.

Four years ago, Andrew J. Wiles was a hot favourite for a Fields Medal,

since in 1993 he had presented a proof of Fermat's Last Theorem - one of the most famous mathematical puzzles, which had remained unsolved for more than 350 years. Shortly afterwards, however, colleagues found a gap in the proof which Wiles was only able to close up a year later. But this was too late for the Fields Medal, because Wiles was then over the age limit of forty. With its special tribute, the International Mathematics Union (IMU) wishes to acknowledge Andrew Wiles' outstanding achievement.

Andrew J. Wiles (born 11 April 1953) is Professor of Mathematics at Princeton University. Since 1995 he has also been a member of the Institute for Advanced Study (IAS). Wiles studied in England at Cambridge University before going to America as assistant professor at Harvard in 1974. In 1982 he became professor in Princeton. His fields of research are number theory and arithmetic geometry.

*From TU Berlin press releases  
at [www.tu-berlin.de/presse/pi/1998/pi182e.htm](http://www.tu-berlin.de/presse/pi/1998/pi182e.htm) and [pi183e.htm](http://www.tu-berlin.de/presse/pi/1998/pi183e.htm)*

*(continued from page 1)*

Office staff are Caroline Baskerville (Assistant to the Executive Director), Chantal Stevenson (Membership and Publications Agent) and Suzanne Lalonde (Executive Office Clerk). There is also Alan Kelm (Site Manager - Camel East), Claire Ryan (Financial Assistant) and Diane Ellis (Comptroller) who work at the Executive Office part-time or on a contract basis.

Members may notice some new names amongst the list of staff as several personnel changes have taken place over the past few months. Jeannine LeBlanc, my assistant since January, 1996, wanted to return to the Maritimes and we were able to schedule things so that her replacement, Caroline Baskerville, could work with Jeannine for a few weeks to make the transition as seamless as possible. This was particularly important since one of the responsibilities of the position is Editorial Assistant for the *CMS Notes*. Claire Ryan has been with us since April, while Chantal Stevenson and Suzanne Lalonde joined the staff in mid-summer. Many of you will get a chance to meet Chantal at a future CMS meeting and Suzanne will be the one you get to talk to when you phone the main CMS number.

In past years, the summer months were busy with all of

the tasks associated with the audit, however, a change in the financial year-end to December 31 meant that it was possible for the Executive Office to consider closing completely for two weeks in August. This experiment appears to have been very successful and, in particular, not have created serious inconvenience. A decision on continuing the practice for future years will be made in the next few months.

Thanks to all the efforts of our editors, the Society has an enviable reputation for the quality and timely publication of its periodicals. All issues of the Journal, the Bulletin, CRUX with MAYHEM and the *it CMS NOTES* have appeared on or before the issue date. The same applies to the Mathematical Reports of the Academy of Science, Royal Society of Canada, a publication for which the CMS Executive Office has contracted to provide production and subscription assistance.

The editors and other volunteers enable the Society's internationally respected periodicals to be produced in an extremely cost effective manner. This is crucial since, like many other societies, the viability of our other activities depends on a healthy publications programme.

For many years, the CMS Series of Advanced Books in Mathematics has been published as part of the Wiley Interscience Series. With some regret, and following a review of

several factors pertaining to the series, the Board of Directors agreed that it was no longer appropriate to continue the current publishing agreement effective July 1, 1998. The CMS is still very interested in publishing such books and has entered into an agreement with Springer Verlag. Jonathan and Peter Borwein will continue to be the Editors-in-Chief for this new series.

Authors interested in submitting manuscripts for the CMS Series of Advanced Books in Mathematics or for the CMS Conference Proceedings Series (co-published with the American Mathematical Society with Anthony Geramita and Niky Kamran as the Editors-in-Chief) are encouraged to contact the editors.

Members and subscribers will soon receive their renewal notices for 1999. To effectively represent and support the mathematics community it is important that the Society has a

strong membership base. Membership does offer numerous benefits and I hope you will renew or become a member of the CMS. *Perhaps current members will take the opportunity of inviting a colleague to join the CMS.* Indeed, as a registered charitable organization, membership fees are tax deductible. This is particularly beneficial for lifetime membership!

Subscription rates for members are a fraction of the regular price and all of our journals are also available on-line at very reasonable prices. Domain access is available for institutions and there are significant savings in the rates for institutional members of the CMS. **Is your institution a CMS member or a subscriber to the Society's journals?** If you need more information on membership or the publications visit our website or please contact Chantal Stevenson ([mpdesk@cms.math.ca](mailto:mpdesk@cms.math.ca)).

## DU BUREAU DU DIRECTEUR ADMINISTRATIF

*(see page 1 for the English version)*

Dans le dernier numéro des *Notes*, notre président, Richard Kane, écrivait que le Conseil d'administration avait approuvé une prolongation de mon mandat de directeur administratif jusqu'au 30 juin 2002. J'aimerais profiter de l'occasion pour remercier tous ceux et celles qui prennent part aux activités de la Société de leur soutien et de leurs encouragements inestimables à mon égard au cours des 19 dernières années. Ce sera pour moi un plaisir de travailler avec bon nombre d'entre vous au cours des quatre années à venir.

D'ici là, bon nombre de tâches intéressantes et diversifiées devront être accomplies. Avec l'aide de nos nombreux bénévoles, tant au sein de la SMC qu'à l'extérieur, nous tâcherons d'accroître les possibilités qui s'offrent à nous et de travailler activement à atteindre l'objectif de la Société : promouvoir et favoriser la découverte et l'apprentissage des mathématiques, et les applications qui en découlent.

Le président a aussi parlé du document intitulé Planifions l'avenir de la SMC, qui a été approuvé par le Conseil et les groupes de travail qui nous aideront à revoir tous les aspects du fonctionnement de la SMC. Le champ d'activité de la Société s'est considérablement élargi au cours des dernières années, ce qui a entraîné une augmentation des tâches administratives et financières. Il est important que toutes nos activités soient administrées de manière efficace et efficiente. Un groupe de travail examinera donc les stratégies administratives : charge de travail, répartition des tâches du personnel, administration des Réunions, rationalisation, exigences associées à Camel, etc.

Les changements ne seront sans doute pas étrangers au processus de planification. Chose certaine, ils ne sont pas étrangers au personnel du bureau administratif d'Ottawa, ou

des centres de rédaction de la SMC (St. John's, Halifax, Hamilton, Winnipeg, Burnaby et Vancouver). En fait, le bureau administratif a déjà fait l'objet de changements considérables au cours des six derniers mois.

Nous avons remanié plusieurs postes pour qu'ils correspondent davantage aux besoins actuels et avons défini plus clairement les responsabilités rattachées à chaque poste. Monique Bouchard, qui est à la SMC depuis 1980, porte maintenant le titre de chef des opérations. Les autres employés à plein temps du bureau sont Caroline Baskerville (adjointe du directeur administratif), Chantal Stevenson (agente responsable de l'adhésion et des publications) et Suzanne Lalonde (commis du bureau administratif). Aux permanents, se greffent également Alan Kelm (webmestre - Camel Est), Claire Ryan (adjointe financière) et Diane Ellis (contrôleuse), qui travaillent au bureau à temps partiel ou à contrat.

Vous serez sans doute nombreux à remarquer de nouveaux noms dans cette liste, car plusieurs changements sont survenus au sein du personnel au cours des derniers mois. Jeannine LeBlanc, mon adjointe depuis janvier 1996, désirait retourner vivre dans les Maritimes. Nous avons fait en sorte que sa remplaçante, Caroline Baskerville, puisse travailler avec elle pendant quelques semaines pour faciliter la transition. Il était important de procéder ainsi, car la titulaire de ce poste est notamment adjointe à la rédaction des *Notes de la SMC*. Claire Ryan fait partie de l'équipe depuis avril, tandis que Chantal Stevenson et Suzanne Lalonde sont avec nous depuis le milieu de l'été. Vous aurez la chance de rencontrer Chantal à l'une de nos Réunions à venir, et c'est Suzanne qui vous répondra lorsque vous composerez le numéro principal de la SMC.

Au cours des dernières années, l'été était une période occupée, car chacun s'affairait aux tâches associées à la vérification. Toutefois, puisque notre année financière se ter-

mine maintenant le 31 décembre, nous pouvions envisager de fermer le bureau complètement pendant deux semaines en aot. L'expérience semble avoir été un succès et surtout, ne paraît pas avoir causé de dérangements importants. Nous déciderons d'ici quelques mois si nous continuerons ou non cette pratique.

Grâce aux efforts de ses rédacteurs, la Société jouit d'une réputation enviable pour la qualité et la promptitude de publication de ses périodiques. Tous les numéros du Journal, du Bulletin, de CRUX with MAYHEM et des *NOTES de la SMC* ont paru à la date prévue ou avant cette date. Même chose pour les Comptes rendus mathématiques de l'Académie des Sciences de la Société royale du Canada, une publication pour laquelle le bureau administratif de la SMC fournit des services liés à la production et à l'adhésion.

Ce sont les rédacteurs et les autres bénévoles qui nous permettent de réaliser nos revues de réputation internationale à un cot si bas. C'est là un aspect fondamental, car, à l'image de nombreuses autres sociétés, la viabilité de nos autres activités dépend du succès de nos publications.

Depuis longtemps, la collection d'ouvrages de mathématiques avancées de la SMC est publiée dans le cadre de la collection Wiley Interscience Series. Avec regret, et à la suite d'une réévaluation de certains aspects de la collection, notre Conseil d'administration a décidé qu'à partir du 1er juillet 1998, il n'était plus opportun de conserver cette entente. Toujours très intéressée à publier de tels livres, la SMC a donc conclu une nouvelle entente avec Springer Verlag. Jonathan et Peter Borwein demeurent les rédacteurs en chef

de cette collection.

Les personnes intéressées à proposer des manuscrits pour la collection d'ouvrages de mathématiques avancées de la SMC ou la collection des Comptes rendus de conférences de la SMC (publiée conjointement avec la American Mathematical Society et ayant comme rédacteurs en chefs Anthony Geramita et Niky Kamran) sont priés de communiquer avec les rédacteurs en chefs de ces publications.

Nos membres et nos abonnés recevront bientôt leurs avis de renouvellement pour l'année 1999. Il est important que la Société compte un grand bassin de membres si elle veut pouvoir représenter et soutenir comme il se doit la communauté mathématique. L'adhésion à la SMC offre de nombreux avantages, et j'espère que vous la renouvellerez ou deviendrez un nouveau membre. *Certains membres actuels en profiteront peut-être pour inviter des collègues à adhérer à la SMC...* De plus, puisque la Société est un organisme à but non lucratif enregistré, les frais d'adhésion sont déductibles du revenu imposable, ce qui peut être très intéressant, particulièrement dans le cas de l'adhésion à vie!

Nos membres peuvent s'abonner à nos publications pour une fraction du prix régulier, et toutes nos revues sont aussi offertes en version électronique à un prix très raisonnable. L'accès par domaine est offert aux membres institutionnels de la SMC. **Votre établissement est-il membre de la SMC ou abonné aux revues de la Société?** Pour de plus amples renseignements sur l'adhésion ou sur nos publications, veuillez voir notre site web ou communiquer avec Chantal Stevenson ([mpdesk@smc.math.ca](mailto:mpdesk@smc.math.ca)).

## AWARDS / PRIX

### New Fellows Elected Royal Society of Canada

Four mathematicians have been elected to the Academy of Science of the Royal Society of Canada.

**Martin Thomas Barlow - Department of Mathematics, University of British Columbia**

Martin Barlow is one of the world leaders in Probability Theory. He has made fundamental contributions to the general theory of stochastic processes, local times, measure-valued processes and stochastic differential equations. His recent work has established him as the international leader in the study of diffusions and heat flow on fractals. He has obtained precise estimates on the heat kernels for a variety of singu-

lar self-similar sets including the Sierpinsk gaskets and carpets. His recent Saint Flour Lectures give a definitive account of the subject and extend some of these fundamental estimates to a variety of other disordered media.

**Victor Ivrii - Department of Mathematics, University of Toronto**

Victor Ivrii is Canada's most distinguished expert on partial differential equations. He proved, by methods of exceptional depth and beauty, the Weyl conjecture on the second term in the asymptotics of the counting function for the eigenvalues of a Laplacian on a manifold with boundary. That conjecture had been open for 70 years and attracted some of the strongest geometric analysts. His other works on hyperbolic equations, fine spectral asymp-

totics and mathematics of large atoms have won him respect and admiration of experts around the world. His forthcoming book on spectral asymptotics is the most insightful and original treatise in that well developed field.

**Scott A. Vanstone - Department of Combinatorics and Optimization, University of Waterloo**

Scott A. Vanstone currently holds the NSERC/Pitney Bowes senior industrial-research chair of cryptography at the University of Waterloo. He is a world authority in cryptology and its applications and has been the driving force in the development of the theory and practice of elliptic curve cryptosystems. These systems are now recognized worldwide as vital to the deployment of wide scale electronic

commerce, in great part due to his efforts. A number of Vanstone's research initiatives are being adapted as international standards. His internationally acclaimed sixth book is the definitive text on applied cryptography: no serious researcher or practitioner in the art would be without it.

**Alfred Weiss - Department of Mathematical Sciences, University of Alberta**

Alfred Weiss is a mathematician who has made fundamental contributions to several aspects of algebraic number theory and the representation theory of groups and orders. The elegant and ingenious work of Weiss and his collaborators is ubiquitous in the study of integral group-rings and the Galois module structure of units of number fields. Renowned for the originality of his ideas, Weiss proved the long-standing Zassenhaus Conjecture concerning units in group-rings by a method which has rapidly become a 'classic' and Weiss' solution of Fröhlich's conjecture on canonical lattices of Galois representations is clearly destined to follow suit.

The Royal Society of Canada (RSC) is a national academy whose ob-

jective is the promotion of learning and research in the arts and sciences. It recognizes distinguished accomplishments and provides timely information and advice to governments and the public. Founded in 1882, the RSC is an independent, self-governing organization supported by its members, governments and other public and private sources. Each of the 1400 Fellows has been elected to one of the three Academies of the RSC by their peers within the Society. At present there are some 90 Fellows in the Mathematics Division.

**CRM - Fields Prize**



*Robert Moody*

The 1998 CRM - Fields prize has been awarded to Robert Moody (University of Alberta). In honour of this award, Moody delivered a public lecture at both the Fields Institute for Research in Mathematical Science and the Centre de Recherches Mathématiques. The lectures were on September 24 and 25 in Toronto and Montreal respectively.

Robert Moody is internationally known for his discovery, independently from and simultaneously with V.G. Kac, of an enormous new class of infinite dimensional Lie Algebras, which are now called Kac-Moody algebras. The significance of the Kac-Moody algebras in mathematics and mathematical physics has continued to increase over the last 20 years and their discovery by Kac and Moody is considered as one of the seminal events in the history of mathematics in the last half of the twentieth century. Moody has made extensive contributions to many aspects of Lie representation theory. In recent years, with various collaborators he has been studying the mathematical aspects of long-range aperiodic order, especially the rapidly emerging area of quasicrystals.

## A NOTE OF THANKS

Richard Kane, University of Western Ontario

The success of the CMS is due to many people: dedicated staff, sponsors and donors, and our members. We would like to take this opportunity to thank all of our supporters. First of all, nearly one in five of our membership (currently numbering 948) is an active volunteer in any given year. There are those who serve on the Board, on committees and editorial boards, and those who organise conferences, educational events and the various competitions for students. The names of these people can be found at the web sites:  
<http://www.camel.math.ca/CMS/Docs/commlist.html> (committee and board memberships) and <http://www.camel.math.ca/CMS/Events/> (conference organization).

We would also like to thank the many donors and sponsors given below who have provided financial support to the CMS during the period July 1, 1997 to August 31, 1998.

Funding was received both to support the ongoing activi-

ties of the Society and to build our endowed funds. The CMS Endowment Fund has nearly reached its initial goal of 1.5 million dollars and in 1999 the income from this endowment will fund the first annual competition to provide grants to support a variety of mathematical activities across the country. The Mathematical Olympiad Fund (now at almost \$150,000) which supports competitions and activities related to the selection and training of Canada's International Mathematics Olympiad team, continues to grow. As these funds increase so does our long-term ability to provide much-needed support to mathematics in Canada.

**Individuals:** Janos Aczel (Waterloo, Ontario), Edward J. Barbeau (Toronto, Ontario), Niels M. Bejlegaard (Stavanger, Norway), Howard E. Bell (St. Catharines, Ontario), J.L. Berggren (Burnaby, British Columbia), David Borwein (London, Ontario), Sue Anne Campbell (Water-

loo, Ontario), Helen F. Cullen (Harwich, Massachusetts), Charles R. Diminnie (San Angelo, Texas), Diane Dowling (Winnipeg, Manitoba), Carl Faith (Princeton, New Jersey), S. Feng (Hamilton, Ontario), K.O. Geddes (Waterloo, Ontario), Edgar G. Goodaire (St. John's, Newfoundland), J. Hardy Grant (Ottawa, Ontario), Bert Hartnell (Halifax, Nova Scotia), Katherine Heinrich (Burnaby, British Columbia), Richard Hoshino (Markham, Ontario), Cyrus Hsia (Scarborough, Ontario), Spiros Karigiannis (Cambridge, Massachusetts), Samuel Melamed (Montreal, Quebec), Nathan S. Mendelsohn (Winnipeg, Manitoba), Richard Nowakowski (Halifax, Nova Scotia), Daniel G. Pich (Waterloo, Ontario), Mark Solomonovich (Edmonton, Alberta), David H. Spring (Toronto, Ontario), A.C. (Tony) Thompson (Halifax, Nova Scotia), Elmer M.. Tory (Sackville, New Brunswick), Robert Vermes (Montreal, Quebec), Al Vilcius (Campbellville, Ontario), T.W. Alan Wong (Markham, Ontario) and 111 other members and donors who chose to remain anonymous.

**Corporations, Foundations, Institutes and Governments:** Amex Canada Inc., Bank of Montreal, Bell Canada, Canada Life Insurance Company, Canadian Airlines International, Centre des Recherches Mathématiques, Deloitte &

Touche, The Fields Institute, Government of Alberta, Government of British Columbia, Government of New Brunswick, Government of Newfoundland, Government of Nova Scotia, Government of Ontario, Gouvernement de Québec, Government of Saskatchewan, Hewlett-Packard (Canada) Inc., Industry Canada, McLean Foundation, OIM 1995 IMO Corporation, Pacific Institute for the Mathematical Sciences, Royal Bank of Canada, Samuel Beatty Fund, Senator Norman M. Paterson Foundation, Springer Verlag, Sun Life Assurance Company of Canada, Waterloo Maple, Waterloo Mathematics Foundation.

**Universities and Schools:** Harry Ainlay High School, Lakeshore Catholic High School, Niagara Catholic District School Board, The Board of Education of the City of North York, Upper Canada College, University of British Columbia (CMS Journal Office), University of Calgary (IMO Training Camp), Dalhousie University (CMS Notes Office), University of Manitoba (TeX Office), McMaster University (CMS Bulletin Office), Memorial University (Crux Office), University of Ottawa (CMS Executive Office), Simon Fraser University (Camel), University of Waterloo (Winter and Summer Training Camps).

## UNE NOTE DE REMERCIEMENT

Richard Kane, Université de Western Ontario

La SMC doit son succès à de nombreuses personnes : son personnel dévoué, ses commanditaires et donateurs, et ses membres. Nous aimions profiter de l'occasion pour remercier tous ceux et celles qui nous appuient. D'abord, mentionnons que près d'un de nos membres sur cinq (la Société en compte actuellement 948) est un bénévole actif. Certains sont membre du conseil d'administration, de comités de la SMC ou de comités de rédaction, d'autres organisent des Réunions, des activités éducatives ou l'un de nos divers concours mathématiques. On pourra consulter la liste de ces personnes aux pages Web suivantes : <http://www.camel.math.ca/CMS/Docs/commlist.html> (membres de comités et du conseil) et <http://www.camel.math.ca/CMS/Events/> (organisation des Réunions).

Nous aimions également remercier les nombreux donateurs et commanditaires qui nous ont appuyé financièrement au cours de la dernière année, soit du 1er juillet 1997 au 31 aot 1998.

Nous avons reu du financement pour les activités courantes de la Société et pour alimenter nos fonds de dotation. Le fonds de dotation de la SMC a presque atteint l'objectif initial de 1,5 million de dollars. En 1999, les revenus tirés de ce fonds financeront le premier concours annuel o seront décernées des bourses utilisées dans le cadre de diverses activités mathématiques aux quatre coins du

pays. Le fonds pour les olympiades mathématiques (qui atteint presque les 150 000 \$), servant à financer les activités et les concours associés à la sélection et à la formation de l'équipe canadienne à l'OIM, continue à croître lui aussi. Plus ces fonds augmentent, plus nous serons en mesure d'offrir un soutien à long terme et nécessaire à la communauté mathématique canadienne. : **Individus :** Janos Aczel (Waterloo, Ontario), Edward J. Barbeau (Toronto, Ontario), Niels M. Bejlegaard (Stavanger, Norvège), Howard E. Bell (St. Catharines, Ontario), J.L. Berggren (Burnaby, Colombie-Britannique), David Borwein (London, Ontario), Sue Anne Campbell (Waterloo, Ontario), Helen F. Cullen (Harwich, Massachusetts), Charles R. Diminnie (San Angelo, Texas), Diane Dowling (Winnipeg, Manitoba), Carl Faith (Princeton, New Jersey), S. Feng (Hamilton, Ontario), K.O. Geddes (Waterloo, Ontario), Edgar G. Goodaire (St. John's, Terre-Neuve), J. Hardy Grant (Ottawa, Ontario), Bert Hartnell (Halifax, Nouvelle-cosse), Katherine Heinrich (Burnaby, Colombie-Britannique), Richard Hoshino (Markham, Ontario), Cyrus Hsia (Scarborough, Ontario), Spiros Karigiannis (Cambridge, Massachusetts), Samuel Melamed (Montréal, Québec), Nathan S. Mendelsohn (Winnipeg, Manitoba), Richard Nowakowski (Halifax, Nouvelle-cosse), Daniel G. Piché (Waterloo, Ontario), Mark Solomonovich (Edmonton, Alberta), David H. Spring (Toronto, Ontario), A.C.

(Tony) Thompson (Halifax, Nouvelle-cosse), Elmer M. Tory (Sackville, Nouveau-Brunswick), Robert Vermes (Montréal, Québec), Al Vilcius (Campbellville, Ontario), T.W. Alan Wong (Markham, Ontario) et 111 autres membres et donateurs qui ont préféré conserver l'anonymat.

**Sociétés, fondations, instituts et gouvernements :** Amex Canada Inc., Banque de Montréal, Bell Canada, La Compagnie d'Assurance du Canada sur la Vie, Lignes aériennes Canadien International, Centre des recherches mathématiques, Deloitte & Touche, l'Institut Fields, le gouvernement de l'Alberta, le gouvernement de la Colombie-Britannique, le gouvernement du Nouveau-Brunswick, le gouvernement de Terre-Neuve, le gouvernement de la Nouvelle-cosse, le gouvernement de l'Ontario, le gouvernement du Québec, le gouvernement de la Saskatchewan, Hewlett-Packard (Canada) Inc., Industrie Canada, la fondation McLean, la Corporation OIM 1995 IMO, l'Institut

du Pacifique pour les sciences mathématiques, la Banque Royale du Canada, le fonds Samuel Beatty, la fondation du sénateur Norman M. Paterson, Spinger Verlag, la Compagnie d'assurance-vie Sun Life du Canada, Waterloo Maple, la fondation pour les mathématiques de Waterloo.

**Universités et écoles :** Harry Ainlay High School, Lakeshore Catholic High School, Niagara Catholic District School Board, Board of Education of the City of North York, Upper Canada College, l'Université de la Colombie-Britannique (bureau du Journal), l'Université de Calgary (camp d'entraînement à l'OIM), l'Université Dalhousie (bureau des Notes de la SMC), l'Université du Manitoba (centre de rédaction TeX), l'Université McMaster (bureau du Bulletin), l'Université Memorial (bureau du Crux), l'Université d'Ottawa (bureau de la SMC), l'Université Simon Fraser (Camel), l'Université Simon Fraser (Camel), l'Université de Waterloo (camps d'entraînement d'hiver et d'été).

## CALL FOR NOMINATIONS / APPEL DE CANDIDATURES

**Editors-in-Chief**  
**CMS Advanced Books in Mathematics**  
**Rédacteurs-en-Chef**  
**Les Livres Avancés en Mathématiques de la SMC**

The term of office of the present Editors-in-chief of the *CMS Advanced Books in Mathematics* will end in December 1999.

The Publications Committee of the Canadian Mathematical Society now invites applications for the next Editor(s)-in-Chief to serve for a five year term.

Applications should consist of a formal letter of application and include the following:

- A curriculum vitae
- A statement of views on the publication indicating if any changes of direction or policy are intended.

The Publications Committee will communicate its recommendation to the Executive Committee of the CMS by April 1999. Members of the mathematical community are welcome to submit their opinions on the series.

Applications with supporting material or comments should be sent to the address below.

The deadline for receipt of applications is **November 15, 1998.**

Le mandat des rédacteurs-en-chef de la série *Les livres*

*avancés en mathématiques de la SMC* prendra fin le 31 décembre 1999.

Le Comité des publications de la Société mathématique du Canada sollicite des mises en candidature pour les prochains rédacteurs-en-chef pour un mandat de cinq ans.

Les mises en candidature doivent inclure une lettre formelle et les éléments suivants:

- Un curriculum vitae
- L'expression de votre opinion sur la publication indiquant si des changements de direction ou de politiques sont envisagés.

Le Comité des publications transmettra ses recommandations au Comité exécutif de la SMC avant le fin d'avril 1999. Les commentaires de la communauté mathématique au sujet de cette sélection sont bienvenus.

Les mises en candidature, avec matériel à l'appui, et/ou commentaires devrait être acheminés à l'adresse ci-dessous.

L'échéance pour la réception des mises en candidature est **le 15 novembre 1998.**

Dr. James A. Mingo, Chair/Président  
 Publications Committee / Comité des publications  
 Department of Mathematics and Statistics, Queen's University  
 Kingston, Ontario, K7L 3N6

## 1998 Canadian Mathematical Society Doctoral Prize Le Prix de doctorat 1998 de la Société mathématique du Canada

The CMS Doctoral Prize has been inaugurated to recognize outstanding performance by a doctoral student. The prize is awarded to the person who received a Ph.D. from a Canadian university in the preceding year (January 1st to December 31st) and whose overall performance in graduate school is judged to be the most outstanding. Although the dissertation will be the most important criterion (the impact of the results, the creativity of the work, the quality of exposition, etc.) it will not be the only one. Other publications, activities in support of students and other accomplishments will also be considered.

The CMS Doctoral Prize will consist of an award of \$500, a two-year complimentary membership in the CMS, a framed Doctoral Prize certificate and a stipend for travel expenses to attend the CMS meeting to receive the award and present a plenary lecture.

### Nominations

Candidates must be nominated by their university and the nominator is responsible for preparing the documentation described below, and submitting the nomination to the address below.

No university may nominate more than one candidate and the deadline for the receipt of nominations is **January 31, 1999**.

The documentation shall consist of:

- A curriculum vitae prepared by the student.
- A resumé of the student's work written by the student and which must not exceed ten pages. The resumé should include a brief description of the thesis and why it is important, as well as of any other contributions made by the student while a doctoral student.
- Three letters of recommendation of which one should be from the thesis advisor and one from an external reviewer. A copy of the external examiner's report may be substituted for the latter. More than three letters of recommendation are not permitted.

La SMC a créé ce Prix de doctorat pour récompenser le travail exceptionnel d'un étudiant au doctorat. Le prix sera décerné à une personne qui aura reçu son diplôme de troisième cycle d'une université canadienne l'année précédente (entre le 1<sup>er</sup> janvier et le 31 décembre) et dont les résultats pour l'ensemble des études supérieures seront jugés les meilleurs. La dissertation constituera le principal critère de sélection (impact des résultats, créativité, qualité de l'exposition, etc.), mais ne sera pas le seul aspect évalué. On tiendra également compte des publications de l'étudiant, de son engagement dans la vie étudiante et de ses autres réalisations.

Le lauréat du Prix de doctorat de la SMC aura droit à une bourse de 500 \$. De plus, la SMC lui offrira l'adhésion gratuite à la Société pendant deux ans et lui remettra un certificat encadré et une subvention pour frais de déplacements lui permettant d'assister à la réunion de la SMC où il recevra son prix et présentera une conférence.

### Candidatures

Les candidats doivent être nommés par leur université; la personne qui propose un candidat doit se charger de regrouper les documents décrits aux paragraphes suivants et de faire parvenir la candidature à l'adresse ci-dessous.

Aucune université ne peut nommer plus d'un candidat. Les candidatures doivent parvenir à la SMC au plus tard le **le 31 janvier 1999**.

Le dossier sera constitué des documents suivants :

- Un curriculum vitae rédigé par l'étudiant.
- Un résumé du travail du candidat d'au plus dix pages, rédigé par l'étudiant, où celui-ci décrira brièvement sa thèse et en expliquera l'importance, et énumérera toutes ses autres réalisations pendant ses études de doctorat.
- Trois lettres de recommandation, dont une du directeur de thèse et une d'un examinateur de l'extérieur (une copie de son rapport fera aussi l'affaire). Le comité n'acceptera pas plus de trois lettres de recommandation.

Chair/Président  
 Doctoral Prize Selection Committee/Comité de sélection du Prix de doctorat  
 CMS Executive Office/Bureau administratif de la SMC  
 577 King Edward, Suite 109  
 P.O. Box 450, Station A/C.P. 450, Succursale A  
 Ottawa, Ontario Canada  
 K1N 6N5

**Winter Meeting  
Queen's University and  
Royal Military College  
Kingston, Ontario  
December 13-15, 1998**

**Third Announcement**

Please refer to the Second Announcement in the September issue of the *CMS Notes* for more complete information on the scientific, education and social programmes. This announcement features a preliminary timetable and any changes to the programmes previously announced. The most up-to-date information concerning the programmes, including scheduling, is available at the following world wide web address:

<http://www.camel.math.ca/CMS/Events/winter98/>

Meeting registration forms and abstract forms for contributed papers may be found in the September issue of the *CMS Notes*.

**Programme Updates**

**Prizes:** The CMS is pleased to announce that the recipient of this year's Adrien Pouliot Prize is Bernard Hodgson (Laval).

The CMS is also pleased to announce that Yuri Berest is the recipient of this year's Doctoral Prize. His lecture is scheduled for 9:00 to 10:00 am on Tuesday, December 15.

Prizes will be awarded at the Delegates' Luncheon, to be held Sunday, December 13, from 12:00 to 1:30 pm at the Howard Johnson Hotel.

**Discrete Geometry:** Here is the current list of speakers: V. Alexandrov (Moscow), P. Atela (Smith College), L. Batten (Manitoba), M. Bayer (Kansas), A. Bezdek (Auburn), K. Bezdek (Budapest), T. Bisztriczky (Calgary), Jin-Yi Cai (Buffalo), R. Connelly (Cornell), H.S.M. Coxeter (Toronto), L. Danzer (Dortmund), T. Havel (Harvard), D. Jacobs (Michigan State), W. Kuperburg (Auburn), M. Senechal (Smith College), I. Talata (Budapest), A. Walz (Cornell), W. Whiteley (York).

**Education Session I : Identifying and overcoming barriers to teaching and learning mathematics at university:** William Byers (Concordia) and Keith Taylor (Saskatchewan) will also speak.

**Education Session II : Teaching mathematics - why we do what we do in the classroom:** This is a new session, supported by the Fields Institute, and organized by William Higginson, Grace Orzech and Morris Orzech (Queen's). It will be held at MacArthur College, situated some distance

from the hotels. The current list of speakers includes George Gadanidis (Durham Board of Education), William Higginson (Queen's), Lynn McAlpine (McGill), Pat Rogers (York) and Nathalie Sinclair (Queen's).

The Queen's University Instructional Development Centre is planning a workshop featuring some of the invited speakers. Meeting participants will have an opportunity to register for this workshop.

**Number Theory:** In the second announcement, the name of Damien Roy (Ottawa) was misspelled. Also W. Nowak's affiliation should be listed as Austria. Our apologies. The following have also agreed to speak: Amir Akbary (Concordia), Gunther Frei (Laval), J. Huard (Canisius and Carleton), Y. Petridis (McGill) and C.S. Rajan (Tata Institute).

**Probability Theory:** The affiliation for Eric Derbez should be listed as McMaster.

**Graduate Student Session:** In this session, graduate students will have an opportunity to present contributed papers on their research. Abstracts should be prepared as specified in the September issue of the *CMS Notes*. A limited fund will be available to pay part of the costs of travel for student speakers (last year this was about \$3,500 at a payment of approximately \$500 per speaker). Please contact the Meeting Directors for details on funding.

**Mathematics on the Internet:** This is a new session, supported by the Fields Institute and the Pacific Institute for Mathematical Sciences, and organized by June Lester (UNB), Nathalie Sinclair (Queen's) and Małgorzata Dubiel (Simon Fraser). The current list of speakers includes Steve Bramham (CECM), Bill Casselman (UBC), Stan Devitt (Waterloo Maple), Chris Howlett (Web Pearls) and Loki Jörgenson (CECM).

There will also be two workshops entitled **Introduction to Geometer's Sketchpad** and **JavaSketchpad: Geometry on the Web**. The first is suitable for teachers and the second for those with some web experience. For more information, please contact the organizers at the following email addresses: [jalester@cecm.sfu.ca](mailto:jalester@cecm.sfu.ca) or [dubiel@cs.sfu.ca](mailto:dubiel@cs.sfu.ca) or [sinclair@cecm.sfu.ca](mailto:sinclair@cecm.sfu.ca)

**Child Care**

Both the Holiday Inn Kingston-Waterfront Hotel and the Howard Johnson Confederation Place Hotel will provide complimentary cribs. Both hotels can arrange for child care, given two weeks notice. Child care at the Holiday Inn can be arranged by contacting Maria D'silva (Housekeeping Department) at (613) 549-8400, ext. 662. Child care at the Howard Johnson can be arranged by contacting the reservations office at (613) 549-6300.

## Travel

Kingston is served by Canada's two major carriers, Air Canada and Canadian Airlines. There are direct flights to Kingston from Ottawa and Toronto - with most of the connections coming through Toronto.

There is also Via Rail service to Kingston from Montreal (either Dorval - 5 minutes by special van from Dorval Airport - or from Centre Ville, in the center of Montreal) and also from Toronto and Ottawa.

The Voyageur bus company operates several daily trips from Montreal, Toronto and Ottawa.

Kingston is also easily reached by car from either Montreal and Toronto by using Highway 401 and exiting at the Highway 15 exit (Exit 623), which brings the driver into Kingston right at the Holiday Inn and Howard Johnson.

From Ottawa one arrives using Highway 15 in the same way. Highway 15 enters the city right near the Holiday Inn and Howard Johnson (see map).

**On arrival:** Upon arrival at Kingston's airport, taxis are available for the 20 minutes ride from the airport to downtown where the conference hotels are located. Taxis are also available at the VIA train station and the Voyageur bus station, both located on Counter Street. The ride from these stations to downtown takes around 15 minutes.

**Car Rentals:** For attendees wishing to rent a car in Kingston, the following car rental agencies are located downtown:

ACE Rent-A-Car: (613) 546-2228

Discount: (613) 548-4004

Hertz: (800) 263-0600.

Car rentals at Kingston's airport are available via National Tilden: (613) 546-1145 or (800) 227-7368.

Car rentals near the VIA/Voyageur stations are available with Budget: (613) 549-2794.

**Parking:** Free parking is available for attendees staying at any of the conference hotels: the Holiday Inn, the Howard Johnson, and the Ramada Plaza.

## Réunion d'hiver Université Queen's et Collège militaire royal Kingston (Ontario) du 13 au 15 décembre 1998 Troisième annonce

Veuillez consulter la deuxième annonce dans le numéro de septembre des *Notes de la SMC* pour obtenir de l'informa-

## Acknowledgements

The CMS wishes to thank the Centre de recherches mathématiques, the Fields Institute and the Pacific Institute for Mathematics Science for their financial support of scientific sessions at this meeting.

The CMS wishes to acknowledge the contribution of the Meeting Committee in presenting exciting scientific, educational and social programmes. Thanks are also extended to members of the host departments who have taken time from their regular duties to help out.

## Meeting Committee

*Meeting Directors:* Tony Geramita (Queen's) and David Wehlau (RMC), *Local Arrangements Committee:* Fady Alajaji (Queen's) and Leo Jonker (Queen's), *Algebraic Geometry:* P. Milman (Toronto), *Discrete Geometry:* Robert Erdahl (Queen's), Marjorie Senechal (Smith College), Walter Whiteley (York), *Education: Teaching and Learning Mathematics at University:* Morris Orzech and Grace Orzech (Queen's), *Extremal Combinatorics:* D. de Caen (Queen's), *Number Theory:* Ram Murty and Noriko Yui (Queen's), *Operator Algebras:* James Mingo (Queen's), *Probability Theory:* Miklos Csörgő (Carleton), *Topology:* Eddy Campbell (Queen's), *Universal Algebra and Multiple-Valued Logic and Contributed Papers:* L. Haddad (RMC), *Graduate Student Session:* David Gregory (Queen's), *Other members:* Monique Bouchard (CMS) – Ex-officio, Jean Fugere (RMC), Graham Wright (CMS) – Ex-officio.

## Items also published with this announcement

List of speakers and titles of talks

Maps of Kingston

Timetable - schedule

## In the next issue of the CMS Notes

Fourth Announcement

Updated Timetable - block schedule

tion détaillée sur les programmes scientifique et pédagogique, et les activités sociales. La présente annonce contient l'horaire et tous les changements aux programmes annoncés précédemment. Vous trouverez l'information la plus récente sur les programmes, y compris les horaires, à l'adresse Web suivante:

<http://www.camel.math.ca/CMS/Events/winter98/>

Un formulaire d'inscription et un formulaire de résumé pour communications libres étaient inclus dans le numéro de septembre des *Notes de la SMC*.

## Changements au programme

**Prix:** La SMC a le plaisir d'annoncer que le Prix Adrien Pouliot 1998 a été remporté par Bernard Hodgson (Laval).

La SMC est également heureuse d'annoncer que le Prix doctoral a été décerné cette année à Yuri Berest, qui donnera sa conférence le mardi 15 décembre de 9 h 10 h.

La remise des prix aura lieu au déjeuner du dimanche 13 entre midi et 13 h 30 à l'Hôtel Howard Johnson.

**Géométrie discrète:** Voici la dernière liste des conférenciers: V. Alexandrov (Moscou), P. Atela (Smith College), L. Batten (Manitoba), M. Bayer (Kansas), A. Bezdek (Auburn), K. Bezdek (Budapest), T. Bisztriczky (Calgary), Jin-Yi Cai (Buffalo), R. Connelly (Cornell), H.S.M. Coxeter (Toronto), L. Danzer (Dortmund), T. Havel (Harvard), D. Jacobs (Michigan), W. Kuperburg (Auburn), M. Senechal (Smith College), I. Talata (Budapest), A. Walz (Cornell), W. Whiteley (York).

**Séance sur l'éducation I : Identifier et vaincre les obstacles à l'enseignement et à l'apprentissage des mathématiques à l'université:** William Byers (Concordia) et Keith Taylor (Saskatchewan) prendront également la parole.

**Séance sur l'éducation II : L'enseignement des mathématiques - Pourquoi fait-on ce qu'on fait en classe?:** Cette nouvelle séance est parrainée par le Fields Institute et organisée par William Higginson, Grace Orzech et Morris Orzech (Queen's). Elle se déroulera au Collège MacArthur situé non loin des hôtels du congrès. Les conférenciers sont: George Gadanidis (Conseil scolaire de Durham), William Higginson (Queen's), Lynn McAlpine (McGill), Pat Rogers (York) et Nathalie Sinclair (Queen's).

Le Centre de perfectionnement de l'enseignement de l'Université Queen's organise un atelier avec certains des conférenciers invités. Les congressistes auront l'occasion de s'inscrire à cet atelier.

**Théorie des nombres:** Dans la deuxième annonce du congrès, une erreur s'est glissée dans le nom de Damien Roy (Ottawa) et l'affiliation de W. Nowak est l'Autriche. Nous vous prions d'excuser ces erreurs. Par ailleurs, d'autres conférenciers ont accepté de prendre la parole : Amir Akbari (Concordia), Gunter Frej (Laval), J. Huard (Canisius et Carleton), C.S. Rajan (Tata Institute) et Y. Petridis (McGill).

**Théorie des probabilités:** L'établissement auquel appartient Eric Derbez est l'Université McMaster.

**Séminaire pour étudiants diplômés:** Au cours de cette séance, les étudiants diplômés présenteront des communications libres sur leurs recherches. Les résumés doivent être préparés selon les instructions publiées dans le numéro de septembre des *Notes*. Un crédit limité sera disponible pour contribuer aux frais de déplacement des conférenciers étudiants (l'année dernière, ce crédit s'élevait à 3 500 \$, à raison de 500 \$ environ par conférencier). Pour de plus amples informations, veuillez communiquer avec l'Administration).

**Mathématiques sur Internet:** Cette nouvelle séance est parrainée par le Fields Institute et le Pacific Institute for Mathematical Science et organisée par June Lester (UNB), Nathalie Sinclair (Queen's) et Małgorzata Dubiel (Simon Fraser). Prendront la parole à cette séance Steve Braham (CECM), Bill Casselman (UBC), Stan Devitt (Waterloo Maple), Loki Jrgenson (CECM) et Chris Howlett (Web Pearls).

Il y aura aussi deux ateliers intitulés **Le carnet du géomètre et Le carnet Java : la géométrie sur Web**. Le premier s'adresse aux enseignants et le deuxième à ceux qui ont une certaine expérience du web. Pour de plus amples informations, veuillez communiquer avec les organisateurs aux adresses électroniques suivantes : [jalester@cecm.sfu.ca](mailto:jalester@cecm.sfu.ca) ou [dubiel@cs.sfu.ca](mailto:dubiel@cs.sfu.ca) ou [sinclair@cecm.sfu.ca](mailto:sinclair@cecm.sfu.ca).

## Enfants

Le Holiday Inn Kingston-Waterfront et le Howard Johnson Confederation Place Hotel fournissent des lits de bébé gratuits. Les deux hôtels peuvent également organiser un service de garderie, moyennant un avis de deux semaines. Au Holiday Inn, veuillez communiquer avec Maria D'Silva (Service de l'entretien ménager) au (613) 549-8400 (poste 662); au Howard Johnson, veuillez contacter le Bureau des réservations au (613) 549-6300.

## Déplacements

La ville de Kingston est desservie par deux grands transporteurs aériens : Air Canada et Canadian Airlines. Il y a des vols directs à partir d'Ottawa et de Toronto et la plupart des correspondances se font à Toronto.

Vous pouvez également emprunter la ligne ferroviaire Via Rail pour Kingston à partir de Montréal (soit par Dorval - à 5 minutes par navette spéciale de l'aéroport de Dorval, soit par le centre-ville de Montréal), d'Ottawa ou de Toronto.

D'autre part, les autocars de la compagnie Voyageur Colonial effectuent plusieurs voyages par jour de Montréal, Ottawa et Toronto.

On peut également se rendre à Kingston en empruntant l'Autoroute 401 de Montréal ou de Toronto et en prenant la sortie de la Route 15 (sortie no 623), qui conduit directement dans la ville de Kingston et aux hôtels Holiday Inn et Howard Johnson.

D'Ottawa, on prend de la même façon la Route 15, qui entre dans la ville de Kingston, tout près des hôtels du congrès (cf. Carte).

**En arrivant:** De l'aéroport de Kingston au centre-ville, le trajet en taxi dure 20 minutes environ. Il y a également des taxis à la gare ferroviaire ainsi qu'à celle des autocars Voyageur, toutes deux situées sur la rue Counter (trajet de 15 minutes).

**Locations de voitures:** Ceux qui désirent louer une voiture à Kingston peuvent s'adresser aux agences suivantes, situées

au centre-ville:

ACE Rent-A-Car: (613) 456-2228

Discount: (613) 548-4004

Hertz: (800) 263-0600.

Les locations de voitures à l'aéroport de Kingston se font à travers la compagnie National Tilden : (613) 546-1145 ou (800) 227-7368; à proximité des stations ferroviaire et d'autocar, on peut s'adresser à Budget : (613) 549-2794.

**Stationnement:** Le stationnement est gratuit pour les congressistes hébergés à l'un des hôtels du congrès, soit le Holiday Inn, le Howard Johnson et le Ramada Plaza.

## Remerciements

La SMC désire remercier le Centre de recherches mathématiques et l'Institut Fields d'avoir contribué financièrement aux séances scientifiques de la Réunion.

La SMC tient à remercier le Comité des Réunions, qui a contribué à l'organisation des activités scientifiques et sur l'éducation, ainsi que des activités sociales. Merci également à toutes les personnes des départements hôtes qui ont empiété sur leurs heures de travail habituelles pour nous venir en aide.

## Comité des Réunions

*Directeurs de la Réunion :* Tony Geramita (Queen's) et David Wehlau (CMR), *Président du Comité local :* Fady Alajaji

(Queen's) et Leo Jonker (Queen's), *Géométrie algébrique* : P. Milman (Toronto), *Géométrie discrète* : Robert Erdahl (Queen's), Marjorie Senechal (Smith College), Walter Whiteley (York), *Éducation : Cerner et surmonter les obstacles à l'enseignement et à l'apprentissage des mathématiques à l'université* : Morris Orzech et Grace Orzech (Queen's), *Combinatoire extrémale* : D. de Caen (Queen's), *Théorie des nombres* : Ram Murty et Noriku Yui (Queen's), *Les Algèbres des opérateurs* : James Mingo (Queen's), *Théorie des probabilités* : Miklos Csörgő (Carleton), *Topologie* : Eddy Campbell (Queen's), *Algèbre universelle et logique multivaluée* et *Communications libres* : L. Haddad (CMR), *Étudiants diplômés* : David Gregory (Queen's), *Autres membres* : Monique Bouchard (SMC) – d'office, Jean Fugere (CMR), Graham Wright (SMC) – d'office.

## Documents publiés avec cette annonce

Liste des conférenciers et titres des conférences

Cartes de Kingston

Horaire et programme

## Dans le prochain numéro des *Notes de la SMC* :

Quatrième annonce du congrès

Horaire et programme à jour

## CMS 50th Anniversary Books

Delegates to the 1998 Winter Meeting can purchase the 50th Anniversary Books at a special price of \$30 per book or \$75 for the set of three. Ordering details are on the Registration form.

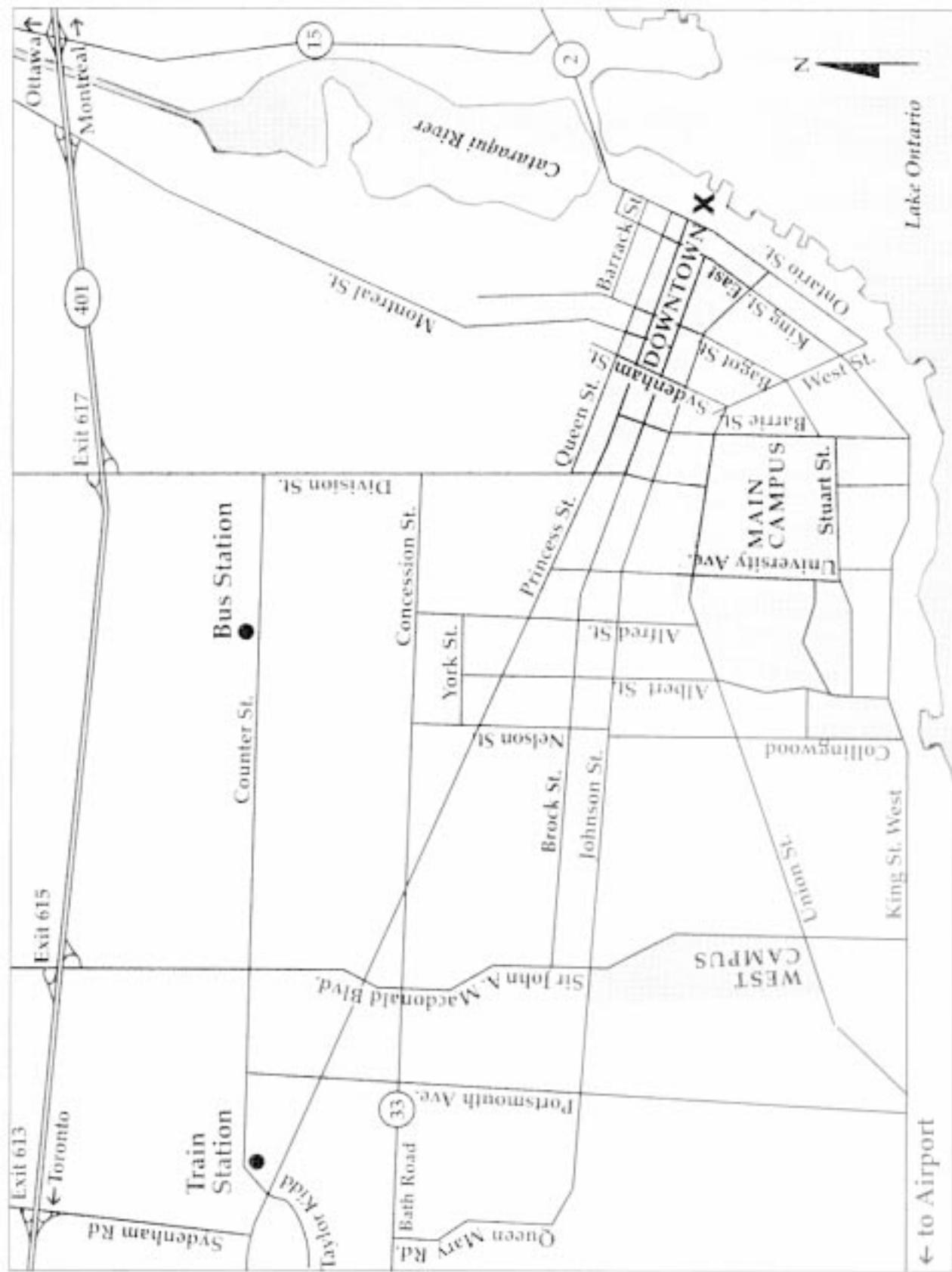
## Livres du 50e anniversaire de la SMC

Les délégués au Réunion d'hiver de la SMC de 1998 peuvent acheter les livres du 50e anniversaire de la SMC pour un prix spécial de 30\$ pour une livre ou 75\$ pour toutes les trois. Pour plus de détails voir la formulaire d'inscription.

## Letters to the Editors/Lettre aux Rédacteurs

The Editors of the *Notes* welcome letters in English or French on any subject of mathematical interest but reserve the right to condense them. Those accepted for publication will appear in the language of submission. Readers may reach us at [notes-letters@cms.math.ca](mailto:notes-letters@cms.math.ca) or at the CMS Executive Office.

Les rédacteurs des *Notes* acceptent les lettres en français ou en anglais portant sur un sujet d'intérêt mathématique, mais ils se réservent le droit de les comprimer. Les lettres acceptées paraîtront dans la langue dans laquelle elles nous sont parvenues. Les lecteurs pourront nous joindre au bureau administratif de la SMC ou à l'adresse suivante: [notes-lettres@smc.math.ca](mailto:notes-lettres@smc.math.ca).



## CMS WINTER MEETING 1998 RÉUNION D'HIVER DE LA SMC

## SCHEDULE - HORAIRE

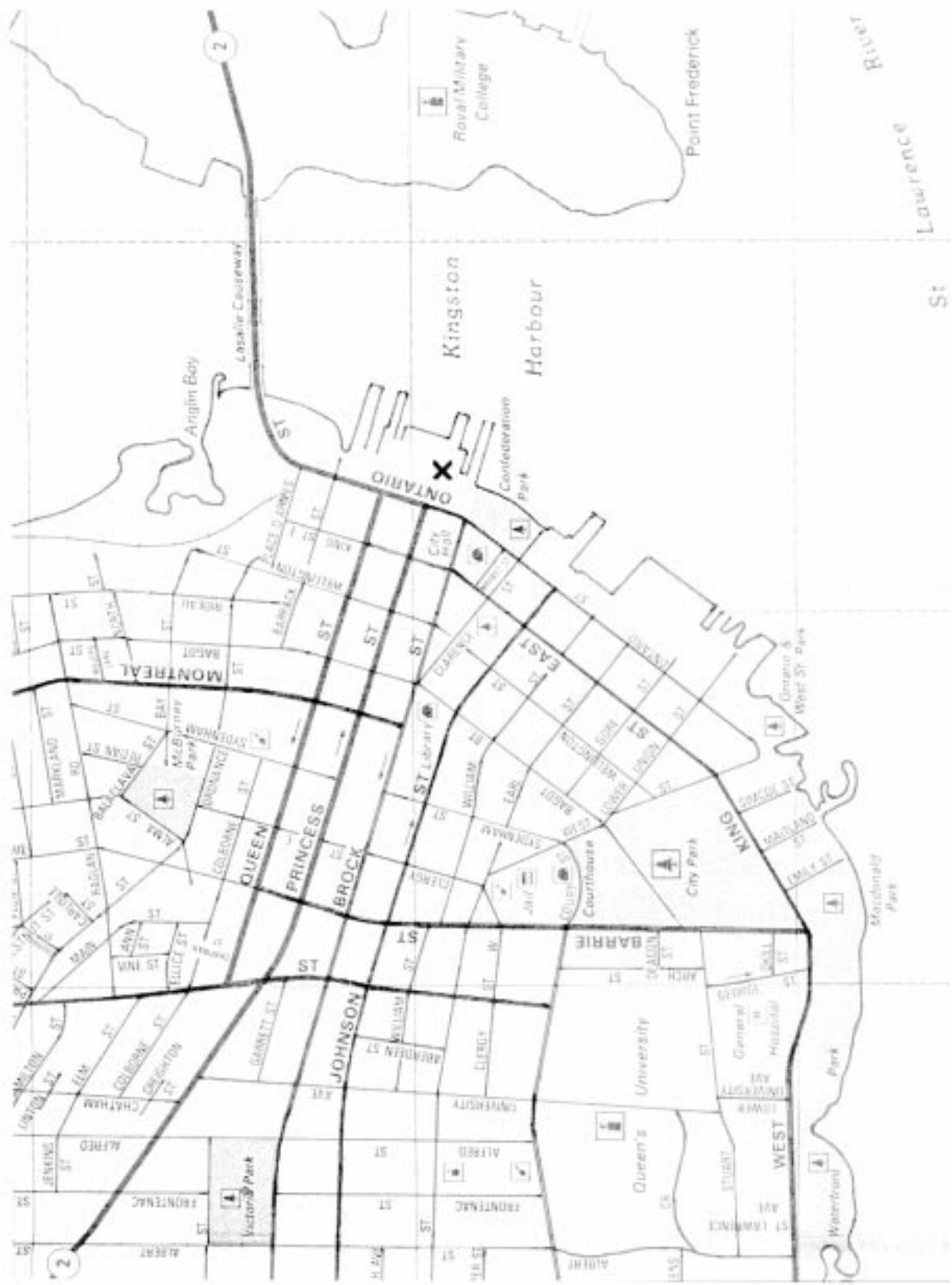
QUEEN'S UNIVERSITY and ROYAL MILITARY COLLEGE - UNIVERSITÉ QUEEN'S et COLLEGE MILITAIRE ROYALE

KINGSTON, ONTARIO

CONFÉRENCES PRINCIPALES: Ballroom, Holiday Inn Waterfront

PLENARY AND PRIZE LECTURES: Ballroom, Holiday Inn Waterfront		Saturday / samedi December 12 décembre	Sunday / dimanche December 13 décembre	Monday / lundi December 14 décembre	Tuesday / mardi December 15 décembre
Time Heure	Friday / vendredi December 11 décembre				
8:00					Registration open from 8:00 a.m. to 5:00 p.m. Bureau d'inscription ouvert de 8:00 à 17:00 Coffee will be available in the Exhibit area / Le café sera servi dans l'aire d'exposition
8:30			12:00 to 17:00 Exhibits - Expositions	8:00 to 17:00 Exhibits / Expositions	
9:00	9:00 - 15:00 Executive Committee Meeting Réunion du Comité exécutif		8:30 - 9:00 Opening Remarks Mots de bienvenue		
10:00	Catarqui Suite Holiday Inn		9:00 - 10:00 PLENARY	9:00 - 10:00 DOCTORAL PRIZE YURI BEREST	
			10:00 - 10:30 COFFEE AVAILABLE / CAFÉ DISPONIBLE		
11:00			10:00 - 12:00 SESSIONS	10:00 - 12:00 SESSIONS	
12:00		Sir John A. MacDonald Room Holiday Inn	CMS Development Group Groupe de développement	12:00 - 13:30 DELEGATES LUNCHEON	12:00 - 13:30 LUNCH / DÉJEUNER
12:30				LUNCH DES PARTICIPANTS	LUNCH / DÉJEUNER
13:00				Ballroom Howard Johnson	DEPARTMENT HEADS' LUNCH
13:30			13:30 - 14:30 Board of Directors Meeting Réunion du Conseil d'administration	13:30 - 14:30 DONAL O'SHEA	13:30 - 14:30 COXETER-JAMES LECTURE HENRI DARMON
14:00			Bellevue North Holiday Inn		

Time Heure	Friday / vendredi December 11 décembre	Saturday / samedi December 12 décembre	Sunday / dimanche December 13 décembre	Monday / lundi December 14 décembre	Tuesday / mardi December 15 décembre
14:30	9:00 - 15:00 Executive Committee Meeting Réunion du Comité exécutif Catarqui Suite Holiday Inn	13:30 - 18:30 Board of Directors Meeting Réunion du Conseil d'administration Bellevue North Holiday Inn	14:30 - 17:30 SESSIONS	14:30 - 18:00 SESSIONS	14:30 - 18:00 SESSIONS
15:00				15:15 - 15:45 <b>COFFEE AVAILABLE / CAFÉ DISPONIBLE</b>	
15:30			17:30 - 19:00 General Meeting Assemblée Générale	14:30 - 18:00 SESSIONS	14:30 - 18:00 SESSIONS
16:00					
17:00					
17:30					
18:00			19:00 - 21:00 Reception Cash-bar and Evening Registration Réception (bar payant) et inscription	18:30 - 19:30 Reception (Cash bar) 19:30 - 22:00 Banquet	Royal Military College
Evening			Holidome Holiday Inn		
				20:00 - 21:00 <b>PUBLIC LECTURE</b> <b>H.S.M. COXETER</b> <i>Triangulated Polygons and Frieze Patterns</i>	Kingston City Hall



**X** = Conference Hotels, Meeting Headquarters

## SCHEDULED SPEAKERS / CONFÉRENCIERS PRÉVUS

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Here is a list of the scheduled speakers, along with the titles of their talks where available. Abstracts for all talks may be found at the following world wide web page after November 1:

<http://www.camel.math.ca/CMS/Events/winter98/>

Voici les conférenciers prévus, ainsi que les titres de leurs conférences. Les résumés pour tous les conférences seront disponibles à l'adresse Web suivante après le 1er novembre :

<http://www.camel.math.ca/CMS/Events/winter98/>

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### COXETER-JAMES LECTURE CONFÉRENCE COXETER-JAMES

**Henri Darmon** (McGill University)

### PUBLIC LECTURE CONFÉRENCE PUBLIQUE

**H.S.M. Coxeter** (University of Toronto) *Triangulated Polygons and Frieze Patterns*

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### PLENARY SPEAKERS CONFÉRENCIERS PRINCIPAUX

**Miklos Csörgo** (Carleton University)

**Henri Darmon** (McGill University)

**Z. Füredi** (University of Illinois at Urbana/Inst. Hungarian Acad. Sci.)

**Donal O'Shea** (Mt. Holyoke College)

**Martha Siegel** (Towson University)

**Morris Orzech** (Queen's University)

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### CONTRIBUTED PAPERS/ COMMUNICATIONS LIBRES

(Org: L. Haddad)

**Speakers:** TBA

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### GRADUATE STUDENT SEMINAR SÉMINAIRE POUR ÉTUDIANTS DIPLÔMÉS

(Org: David Gregory)

**M. Harper** (McGill University)

**Y. Lui** (Harvard University)

**S. Sumner** (Queen's University)

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### SPECIAL SESSIONS / SÉANCES SPÉCIALES

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#### Algebraic Geometry / Géométrie algébrique

(Org: P. Milman)

**Fedya Bogomolov** (NYU Courant Institute)

**Askold Khovanskii** (University of Toronto)

**Donal O'Shea** (Mt. Holyoke College)

**Jenia Shustein** (Tel-Aviv University)

**Yosef Yomdin** (Weizmann Institute)

**Ed Barbeau** (University of Toronto)

**Bernard Hodgson** (University of Laval)

**Donal O'Shea** (Mt. Holyoke College)

**Tom Rishel** (Cornell University)

**Discrete Geometry / Géométrie discrète**

(Org: Robert Erdahl, Marjorie Senechal, Walter Whiteley)

**Speakers:** TBA**Extremal Combinatorics / Combinatoire extrémale**

(Org: D. de Caen)

**Zoltan Füredi** (University of Illinois at Urbana and Math. Inst. Hungarian Acad. Sci.)**Richard Anstee** (University of British Columbia)**Jason Brown** (Dalhousie University)**Ralph Faudree** (University of Memphis)**Jerrold Griggs** (University of South Carolina)**Penny Haxell** (University of Waterloo)**David Fisher** (University of Colorado)**Felix Lazebnik** (University of Delaware)**Laszlo Székely** (University of South Carolina)**Bing Zhou** (Trent University)**Number Theory / Théorie des nombres**

(Org: Ram Murty, Noriko Yui)

**Henri Darmon** (McGill University)**Chantal David** (Concordia University)**Jacek Fabrykowski** (University of Manitoba)**E. Goren** (Concordia & McGill University, CICMA)**C. Greither** (University of Laval)**Hershy Kisilevsky** (Concordia University)**Manfred Kolster** (McMaster University)**A. Ledet** (Queen's University)**Claude Levesque** (University of Laval)**Kumar Murty** (University of Toronto)**W. Nowak** (University of Austria)**Vladimir Platonov** (University of Waterloo)**Damien Roy** (University of Ottawa)**Gary Walsh** (University of Ottawa)**Hugh Williams** (University of Manitoba)**Kenneth Williams** (Carleton University)**Operator Algebras / Algèbre d'opérateurs**

(Org: James Mingo)

**Ken Davidson** (University of Waterloo)**George Elliot** (University of Toronto)**Thierry Giordano** (University of Ottawa)**Andu Nica** (University of Waterloo)**Probability Theory / Théorie des probabilités**

(Org: Miklos Csörgo)

**Miklos Csörgo** (Carleton University)**Siva Athreya** (University of Washington)**M. Claude Belisle** (Université Laval)**Murray D. Burke** (University of Calgary)**Colleen D. Cutler** (University of Waterloo)**Andre R. Dabrowski** (University of Ottawa)**Eric Derbez** (McMaster University)**Shui Feng** (McMaster University)**Rene Ferland** (Université du Québec à Montréal)**Antonia Foldes** (The College of Staten Island, CUNY)**Genevieve Gauthier** (École des Hautes Études Commerciales)**Christian Genest** (Université Laval)**Edit Gombay** (University of Alberta)**Lajos Horvath** (University of Utah)**Gail Ivanoff** (University of Ottawa)**Mike Kouritzin** (University of Alberta)**Reg Kulperger** (University of Western Ontario)**Brenda MacGibbon** (Université du Québec à Montréal)**Neal Madras** (York University)**Don L. McLeish** (University of Waterloo)**Majid Mojirsheibani** (Carleton University)**Bruno Remillard** (Université du Québec à Trois-Rivières)**Pál Révész** (Math. Inst. Hung. Acad Sci.)**Jeffrey S. Rosenthal** (University of Toronto)

**Tom Salisbury** (York University)  
**Byron Schmuland** (University of Alberta)  
**Qi-Man Shao** (University of Oregon)  
**Zhan Shi** (Université Paris VI)  
**Gordon Slade** (McMaster University)  
**Christopher G. Small** (University of Waterloo)  
**Barbara Szyszkowicz** (Carleton University)  
**Keith Worsley** (McGill University)  
**Hao Yu** (University of Western Ontario)  
**Ricardas Zitikis** (Carleton University)

**Steve Halperin** (University of Toronto)  
**Barry Jessup** (University of Ottawa)  
**Brenda Johnson** (Union)  
**Keith Johnson** (Dalhousie University)  
**Kathryn Lesh** (University of Toledo)  
**Gaunce Lewis** (Syracuse University)  
**John Martino** (University of Western Michigan)  
**Joe Neisendorfer** (Rochester University)  
**Doug Ravenel** (Rochester University)

**Topology - 4 Sub-sessions / Topologie - 4 sous-séances**  
(Org: Eddy Campbell)

**1) Differential Geometry and Global Analysis**  
**Géométrie différentielle et analyse globale**  
(Org: Muang Min-Oo, McKenzie Wang)

**Igor Belagradek** (McMaster University)  
**Christoph Boehm** (McMaster University)  
**Jeffrey Boland** (McMaster University)  
**Jingyi Chen** (University of British Columbia)  
**Ailana Fraser** (Stanford University)  
**Mike Gage** (University of Rochester)  
**W. Goldman** (University of Maryland)  
**Miroslav Lovric** (McMaster University)  
**Ross Niebergall** (University of Northern B.C.)  
**Mohan Ramachandran** (SUNY)  
**P. Ryan** (McMaster University)

**2) Homotopy Theory / Théorie de l'homotopie**  
(Org: Lisa Langsetmo, Jim Shank)

**Bob Bruner** (Wayne State)  
**Dan Christensen** (Johns Hopkins University)  
**Fred Cohen** (Rochester)  
**Gustavo Granja** (MIT)

**3) Set Theoretic Topology / Topologie des ensembles**  
(Org: Juris Steprans, Steve Watson)

**Justin Moore** (University of Toronto)  
**Murray Bell** (University of Manitoba)  
**Ilijas Farah** (York University)  
**Gary Gruenhage** (Auburn University)  
**Frank Tall** (University of Toronto)  
**Grant Woods** (University of Manitoba)  
**Valery Miskin** (Kemerovo State University)  
**Wistar Comfort** (Wesleyan University)  
**Murat Tuncali** (Nipissing University)  
**Eduardo Santillan** (UNAM - Mexico)  
**Ed Tymchatyn** (University of Saskatchewan)

**4) Symplectic/Low Dimensional Topology**  
**Topologie en basses dimension/**  
**Topologie symplectique**

(Org: Steve Boyer, Jacques Hurtubise, François Lalonde)

**Speakers:** TBA

**Universal Algebra and Multiple-Valued Logic**  
**Algèbre universelle et logique multiple valeurs**  
(Org: L. Haddad)

**Speakers:** TBA

# Joint Mathematics Meetings

## San Antonio, Texas

**Henry B. Gonzales Convention Center**

January 13–16, 1999

Joint Mathematics Meetings includes the 105th Annual Meeting of the AMS, the 82nd Meeting of the Mathematical Association of America (MAA), the annual meetings of the Association for Women in Mathematics (AWM) and the National Association of Mathematicians (NAM), and the winter meeting of the Association for Symbolic Logic (ASL).

This is a listing of the AMS and MAA invited addresses, the Minicourses, and some of the sessions. For a complete listing of sessions and activities, or to register, please refer to the announcements in the October issues of *Focus* and *Notices* or to the meeting website at [http://www.ams.org/amsmtgs/2031\\_intro.html](http://www.ams.org/amsmtgs/2031_intro.html). The housing reservation deadline is November 23; the advance registration deadline is December 21, 1998. For additional information call 1-800-321-4267, ext. 4139, or email [meet@math.ams.org](mailto:meet@math.ams.org).

### AMS-MAA Invited Addresses

**Jennifer Tour Chayes.** Microsoft, *Title to be announced*, Wednesday, 11:10 a.m.

**Joan Feigenbaum.** AT&T Bell Laboratories, *Massive graphs: Algorithms, applications, and open problems*, Friday, 11:10 a.m.

### AMS Invited Addresses

**Andrea Bertozzi,** Duke University, *Title to be announced*, Saturday, 2:15 p.m.

**Helmut Hofer,** New York University-Courant Institute, *Symplectic geometry from a dynamical systems point of view*, Wednesday, Thursday and Friday, 1:00 p.m. (AMS Colloquium Lectures)

**Nancy J. Kopell,** Boston University, *We got rhythm: Dynamical systems of the nervous system*, Wednesday, 8:30 p.m. (AMS Josiah Willard Gibbs Lecture)

**Rita Colwell,** National Science Foundation, *Title to be announced*, Friday, 4:20 p.m. (Committee on Science Policy Government Speaker)

**Sorin Popa,** University of California Los Angeles, *Title to be announced*, Friday, 9:00 a.m.

**Chuu-Lian Terng,** Northeastern University, *Geometry of soft-on equations*, Wednesday, 10:05 a.m.

**Alan D. Weinstein,** University of California, Berkeley, *Midpoints*, Thursday, 3:20 p.m.

### MAA Invited Addresses

**Jean Pedersen,** Santa Clara University, *Extending and Generalizing the Pascal Triangle: An Interplay of Algebra and Geometry*, Wednesday, 2:15 p.m.–3:05 p.m.

**John H. Conway,** Princeton University, *The Symmetries of Things: Real and Conceptual*, Wednesday, 3:20 p.m.–4:10 p.m.

**John Faurel,** The Open University, *The History of Mathematics and its Future*, Thursday, 10:05 a.m.–10:55 a.m.

**Jeremy Kilpatrick,** University of Georgia, *The Role of Research in Improving School Mathematics*, Friday, 2:15 p.m.–3:05 p.m.

**Edward G. Dunne,** American Mathematical Society, *Pisot and Continued Fractions*, Friday, 7:30 p.m.–8:20 p.m. (Student Lecture)

**Rodica E. Simion,** George Washington University, *Convex Polytopes and Partially Ordered Sets*, Saturday, 9:00 a.m.–9:50 a.m.

**Jonathan M. Borwein,** Simon Fraser University, *Experimental Mathematics: Insight from Computation*, Saturday, 10:05 a.m.–10:55 a.m.

### Joint Special Sessions

*Geometry in Dynamics.* **Krystyna Kuperberg,** Auburn University.

*Mathematics and Education Reform.* **William H. Barker,** Bowdoin College, **Jerry L. Bona,** University of Texas at Austin, **Naomi Fisher,** University of Illinois at Chicago, and **Kenneth C. Millett,** University of California Santa Barbara.

*Model Theory and its Applications.* **Anand Pillay,** MSRI and University of Illinois, Urbana.

*Research in Mathematics by Undergraduates.* **John E. Meier** and **Leonard A. VanWyk,** Lafayette College.

*The History of Mathematics.* **Karen H. Parshall,** University of Virginia, and **Victor J. Katz,** University of the District of Columbia.

### AMS Special Sessions

*Banach Spaces of Holomorphic Functions and Operators on These Spaces.* **Benjamin A. Lotto,** Vassar College, and **Pamela B. Gorkin,** Bucknell University.

*Bergman Spaces and Related Topics.* **Peter L. Duren,** University of Michigan, Ann Arbor, and **Michael Stessin,** SUNY at Albany.

*Combinatorial Topology.* **Laura M. Anderson** and **Jonathan P. McCammond,** Texas A&M University.

*Commutative Algebra.* **Scott Thomas Chapman,** Trinity University.

*Commutative Algebra and Algebraic Geometry.* **Roger A. Wiegand,** University of Nebraska and Purdue University, and **Susan Elaine Morey,** Southwest Texas State University.

*Computational Algebraic Geometry for Curves and Surfaces.* **Mika K. Seppala,** Florida State University, and **Emil J. Volcheck,** National Security Agency.

*Development of Electronic Communications in Mathematics.* **Alfonso Castro,** University of North Texas, and **Rafael De La Llave,** University of Texas at Austin.

*Discrete Models and Difference Equations.* **Saber Elaydi,** Trinity University, and **Gerry Ladas,** University of Rhode Island.

*Dynamical, Spectral, and Arithmetic Zeta Functions;* Michel L. Lapidus, University of California, Riverside, and Machiel van Frankenhuyzen, Institut des Hautes Études Scientifiques.

*Hamiltonian Mechanics: Applications to Celestial Mechanics and Chemistry;* Michael K. Stednev, The University of Texas at Austin, and Stephen R. Wiggins, California Institute of Technology.

*Mathematics Education and Mistaken Philosophies of Mathematics;* Saunders Mac Lane, University of Chicago, and Richard A. Askey, University of Wisconsin-Madison.

*Operator Algebras and Applications;* Alain P. Donsig, University of Nebraska-Lincoln, and Nik Weaver, Washington University.

*Probabilistic Combinatorics;* Bela Bollobas, University of Memphis; Jeong Han Kim, Microsoft.

*Recent Developments in Differential Geometry;* Huai-Dong Cao and Jian Zhou, Texas A&M University.

*Several Complex Variables;* Emil J. Straube and Harold P. Boas, Texas A&M University.

*Structures in Algebraic and Analytic Geometry;* Caroline G. Grant, U.S. Naval Academy, and Ruth I. Michler, University of North Texas.

*The Functional and Harmonic Analysis of Wavelets;* Lawrence W. Baggett, University of Colorado, and David R. Larson, Texas A&M University.

*The Mathematics of the Navier-Stokes Equations;* Peter A. Perry and Zhong-Wei Shen, University of Kentucky.

### MAA Minicourses

**Minicourse #1:** *Mathematics, Calculus, and Modeling Using the TI-92;* Phoebe L. Judson, Trinity University; William C. Bauldry, Appalachian State University, and Richard D. West, U. S. Military Academy.

**Minicourse #2:** *Mathematical Finance;* Walter R. Stromquist, Berwyn, PA (computer minicourse).

**Minicourse #3:** *Developing Materials for Liberal Arts Mathematics That Use Elementary Graph Theory and Emphasize Applications to Everyday Experience;* Helen Christensen, Loyola College in Maryland.

**Minicourse #4:** *The Mathematics of the Perfect Shuffle;* S. Brent Morris, National Security Agency.

**Minicourse #5:** *Bundling Custom Classroom Capsules with Maple Programming;* Douglas E. Ensley, Shippensburg University (computer minicourse).

**Minicourse #6:** *Cooperative Learning in Undergraduate Mathematics Education;* Barbara E. Reynolds, Cardinal Stritch University, and William E. Fenton, Bellarmine College.

**Minicourse #7:** *Finding Motivation for Upper Division Mathematics through Original Historical Sources;* Jerry M. Lodder, New Mexico State University, and David J. Pengelley, New Mexico State University.

**Minicourse #8:** *Teaching a Course in the History of Mathematics;* Victor J. Katz, University of the District of Columbia, and V. Frederick Rickey, U. S. Military Academy.

**Minicourse #9:** *Exploring Abstract Algebra through Interactive Labs;* Allen C. Hibbard, Central College, and Kenneth M. Levasseur, University of Massachusetts, Lowell (computer minicourse).

**Minicourse #10:** *Facilitating Active Learning: Concrete Ways to Foster Student Participation;* Sandra L. Rhoades, Keene State College.

**Minicourse #11:** *Creating Interactive Texts in Mathematica;* John R. Wicks, North Park University (computer minicourse).

**Minicourse #12:** *Writing and the Teaching of Mathematics;* John E. Meier, Lafayette College, and Thomas W. Rishel, Cornell University.

**Minicourse #13:** *Getting Students Involved in Undergraduate Research;* Joseph A. Gallian, University of Minnesota, Duluth, and Aparna W. Higgins, University of Dayton.

**Minicourse #14:** *An Introduction to Wavelets;* Colm K. Mulcahy, Spelman College (computer minicourse).

**Minicourse #15:** *Music and Mathematics;* Leon Harkelroad, Bard College.

**Minicourse #16:** *Using Hand-held CAS Throughout the Mathematics Curriculum;* Wade Ellis, West Valley College; L. Carl Leinbach, Gettysburg College, and Bert K. Waits, Ohio State University.

### MAA Contributed Paper Sessions

*The Use of Technology in Teaching Abstract Mathematics;* Douglas F. Ensley, Shippensburg University.

*Chaoticlike Lefschetz;* Barbara A. Jur, Malcolm Community College; Richard A. Gillman, Valparaiso University; Jimmy L. Solomon, Georgia Southern University; Allen E. Pulsifer, College of Science and Technology; and Linda R. Sons, Northern Illinois University.

*Teaching Statistics: Teaching the Reasoning and New Technological Tools;* Dexter C. Whittinghill, Rowan University; Franklin A. Wattenberg, National Science Foundation; Mary R. Parker, Austin Community College; and Donald L. Bentley, Pomona College.

*Mathematics Competitions;* Harold B. Reiter, University of North Carolina Charlotte; Stephen B. Maurer, Swarthmore College; William P. Fox, U.S. Military Academy; and Susan Schwartz Wildstrom, Montgomery City Schools.

*Innovations in Teaching Abstract Algebra;* Vesna Kilibarda, University of Alaska Southeast; Allen C. Hibbard, Central College; and Ellen Maycock Parker, DePaul University.

*Ethical, Humanistic, and Artistic Mathematics;* Alvin M. White, Harvey Mudd College; Robert P. Webber, Longwood College; and Stefanos P. Gialamas, Illinois Institute of Art.

*Geometry in the Classroom in the Next Millennium;* Colin K. Mulcahy, Spelman College; David W. Henderson, Cornell University; and Barry Schiller, Rhode Island College.

*Discrete Mathematics Revisited;* Richard K. Molnar, Macalester College, and Suzanne M. Molnar, College of St. Catherine.

*Projects That Work in Applied Mathematics Courses;* Alexandra Kurepa, North Carolina A&T State University, and Henry Warchall, University of North Texas.

*Innovative Use of Distance Learning Techniques to Teach Post-Secondary Mathematics;* Brian E. Smith, McGill University, and Marcelle Bessman, Jacksonville University.

*Integrating Mathematics and Other Disciplines;* William G. McCallum, University of Arizona; Nicholas T. Lisito, SUNY Farmingdale; and Yajun Yang, SUNY Farmingdale.

*The Integral Role of the Two-Year College in the Preservice Preparation of Elementary School Teachers;* Mercedes A. McGowen, William Rainey Harper College; Joanne V. Peoples, El Paso Community College; and William E. Haver, Virginia Collaborative for Excellence in the Preparation of Teachers.

*Proof in Mathematical Education;* G. Joseph Wimbush, Huntingdon College, and Gary Davis, University of Southampton.

## INSTITUTE DES SCIENCES MATHÉMATIQUES CRM-ISM Postdoctoral Fellowships/Bourses Postdoctorales CRM-ISM

The Institut des sciences mathématiques (ISM) and the Centre de recherches mathématiques (CRM) are inviting applications for their joint postdoctoral fellowship program starting approximately in September 1999. The annual stipend is Cdn. \$32,000 for one year, renewable for a second year.

The Institut des sciences mathématiques (ISM) coordinates the graduate programs of six of Québec's universities (Concordia, Laval, McGill, Sherbrooke, Université de Montréal and UQAM). More than 200 faculty members participate in its ten programs: Algebra and Number Theory, Analysis, Combinatorics, Algebraic Computation and Algorithms, Nonlinear Dynamics, Geometry and Topology, Applied and Computational Mathematics, Mathematical Physics, Probability: Theory and Applications, Decision Theory and Mathematical Statistics, and Category Theory and Applications.

The Centre de recherches mathématiques (CRM) is a national research center in the mathematical sciences. Its ongoing areas of research include: algebra and combinatorics, analysis, differential equations and approximation theory, geometry and topology, numerical analysis, optimisation and multidisciplinary research, mathematical physics, probability and statistics, and dynamical systems. Each year, the CRM organizes a wide range of events attracting participants from around the world. The main theme for 1999-2000 is Mathematical Physics and in 2000-01 they will be Mathematical Methods in Biology and Medicine and Symplectic Geometry and Topology and Gauge Theory. However, high-quality applications in all fields of interest to the CRM or to the ISM are welcome.

Applications must arrive at the CRM by **Friday, January 8, 1999**. The following documents are required: a résumé, a statement of research, and three letters of recommendation. Please indicate in your application which ISM program best represents your research interests. An e-mail address and fax number (if available) must be provided with all correspondence. Candidates are encouraged to contact the professors with whom they would like to work.

L'Institut des sciences mathématiques (ISM) et le Centre de recherches mathématiques (CRM) sollicitent des candidatures dans le cadre de leur programme conjoint de bourses

postdoctorales débutant approximativement en septembre 1999. Les bourses sont d'une valeur de 32 000 \$ CAN pour un an, renouvelables pour une deuxième année.

L'Institut des sciences mathématiques (ISM) coordonne les programmes d'études supérieures de six des universités québécoises (Concordia, Laval, McGill, Sherbrooke, Université de Montréal et UQAM). Plus de 200 professeurs et professeures participent à ses dix programmes: Algèbre et théorie des nombres, Analyse, Combinatoire et calcul algébrique, Dynamique non linéaire, Géométrie et topologie, Mathématiques appliquées et calcul scientifique, Physique mathématique, Probabilités: théorie et applications, Théorie de la décision et statistique, et Théorie des catégories et applications.

Le Centre de recherches mathématiques (CRM) est un centre national de recherche en sciences mathématiques. Les recherches qu'on y poursuit portent entre autres sur les domaines suivants: l'algèbre et la combinatoire, l'analyse, les équations différentielles et la théorie de l'approximation, la géométrie et la topologie, l'analyse numérique, l'optimisation et les recherches multidisciplinaires, la physique mathématique, les probabilités et la statistique, et les systèmes dynamiques. Le CRM organise annuellement un large éventail d'activités scientifiques impliquant une participation internationale. Le thème principal de l'année 1999-2000 sera la physique mathématique alors que les thèmes de l'année 2000-01 seront les méthodes mathématiques en biologie et en médecine et la topologie-géométrie symplectiques et la théorie de jauge. Cependant, toute candidature méritoire touchant à un domaine d'intérêt du CRM ou de l'ISM sera bienvenue.

Les candidatures doivent parvenir au CRM (adresse ci-dessous) au plus tard **le vendredi 8 janvier 1999**. Les documents suivants doivent être joints: un curriculum vitae, un résumé des intérêts de recherche, et trois lettres de recommandation. Vous êtes priés d'indiquer sur votre demande lequel des programmes de l'ISM représente le mieux vos intérêts de recherche. Une adresse électronique et un numéro de télécopieur (si disponible) doivent être inclus avec toute correspondance. Les personnes intéressées sont encouragées à contacter les professeurs avec qui elles aimeraient travailler.

Applications must be sent to/Les candidatures doivent être envoyées à:

Monsieur Luc Vinet, Directeur  
Centre de recherches mathématiques  
Université de Montréal  
Case postale 6128, Succursale Centre-Ville  
Montréal (Québec), Canada, H3C 3J7  
Fax/Télécopieur: (514) 343-2254  
email/Courrier électronique: [vinet@crm.umontreal.ca](mailto:vinet@crm.umontreal.ca)

**MEMORIAL UNIVERSITY OF NEWFOUNDLAND  
St. John's, Newfoundland, Canada A1C 5S7  
DEPARTMENT OF MATHEMATICS AND STATISTICS**

Applications are invited for a tenure track position in **ALGEBRA** at the level of Assistant Professor, effective September 1999, subject to availability of funds.

Demonstrated superior capability as a teacher is a requirement for this position. In addition, the successful candidate should have an outstanding research record and will be expected to enhance the current active algebra program in the department.

Rank and salary depend upon qualifications and are subject to negotiation.

Applications, marked **REF: MS/ALG/99**, with complete curriculum vitae, a statement of present research and teaching interests, and the names and mailing/e-mail addresses of at least three referees should be sent to:

**MS/ALG/99**  
Department of Mathematics and Statistics  
Memorial University of Newfoundland  
St. John's, Newfoundland, Canada A1C 5S7

The closing date for receipt of applications is **November 30, 1998** or until the position is filled.

Memorial University is committed to the principle of equity in employment. In accordance with Canadian Immigration requirements, priority will be given to Canadian citizens and permanent residents of Canada.

Memorial University is part of a vibrant, local scientific and engineering community which maintains an inventory of available positions for qualified partners. Partners of candidates for these positions are invited to include their resume for possible matching with other job opportunities.

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**MEMORIAL UNIVERSITY OF NEWFOUNDLAND  
St. John's, Newfoundland, Canada A1C 5S7  
DEPARTMENT OF MATHEMATICS AND STATISTICS**

Applications are invited for one, or more, tenure track position(s) in **APPLIED MATHEMATICS** at the level of Assistant Professor, effective September 1999, subject to availability of funds. Candidates specializing in dynamical systems or computational partial differential equations with interest in applications in the sciences are especially encouraged to apply.

An excellent record of research, demonstrated excellence as a teacher and a PhD in mathematics are requirements for this position. Salary depends upon qualifications and is subject to negotiation.

Applications, marked **REF: MS/AMAT-1/99**, with complete curriculum vitae, a statement of present research and teaching interests, and the names and mailing/e-mail addresses of at least three referees should be sent to:

**MS/ALG/99**  
Department of Mathematics and Statistics  
Memorial University of Newfoundland  
St. John's, Newfoundland, Canada A1C 5S7

The closing date for receipt of applications is **November 30, 1998** or until the position is filled.

Memorial University is committed to the principle of equity in employment. In accordance with Canadian Immigration requirements, priority will be given to Canadian citizens and permanent residents of Canada.

Memorial University is part of a vibrant, local scientific and engineering community which maintains an inventory of available positions for qualified partners. Partners of candidates for these positions are invited to include their resume for possible matching with other job opportunities.

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**THE UNIVERSITY OF TORONTO**  
**Department of Electrical and Computer Engineering and Department of Mathematics**

The Department of Electrical and Computer Engineering and the Department of Mathematics at the University of Toronto invite applications for a joint tenure-stream Assistant Professor position to build on the collaboration between the two departments in research and teaching.

The successful candidate will have a demonstrated ability as a researcher in mathematics and in the application of mathematics in electrical and computer engineering. Areas of interest include applied probability, stochastic differential equations and computational partial differential equations, and their application in communications, network modelling or real-time systems.

The position involves teaching and research in Electrical Engineering, Computer Engineering, and Mathematics. Candidates must have a doctoral degree, an outstanding academic record and an effective teaching ability.

Additional information can be found on the Web pages at:

*<http://www.ece.toronto.edu> and <http://www.math.toronto.edu/jobs>*

Applicants should send a curriculum vitae, including a statement about teaching and research interests. They should also arrange for at least three reference letters about their research and teaching abilities to be sent to:

Professor Safwat G. Zaky, Chair  
 Department of Electrical and Computer Engineering  
 University of Toronto  
 10 King's College Road, Room 1024  
 Toronto, Ontario M5S 3G4, Canada

To ensure consideration, please send the application material by **October 30, 1998**.

*In accordance with Canadian Immigration requirements, priority will be given to Canadian citizens and permanent residents. In accordance with its Employment Equity Policy, the University of Toronto encourages applications from qualified women or men, members of visible minorities, aboriginal peoples and persons with disabilities.*

**THE UNIVERSITY OF TORONTO**  
**Department of Mathematics**  
**Tenure-Stream Appointment in Algebra, Number Theory and Geometry**

The University of Toronto solicits applications for a tenure-stream appointment in the fields of Algebra, Number Theory and Geometry. Preference will be given to researchers in arithmetic geometry.

The appointment is at the downtown (St. George) campus at the level of Assistant Professor, to begin July 1, 1999. Candidates are expected to have demonstrated excellence in both teaching and research after the Ph.D.; in particular, a candidate's research record should show clearly the ability to make significant original and independent contributions to Mathematics. Salary commensurate with experience.

Applicants should send their complete C.V. including a list of publications, a short statement describing their research programme, and all appropriate material about their teaching. They should also arrange to have at least four letters of reference sent directly to Search Committee, Department of Mathematics, University of Toronto, Toronto, Canada M5S 3G3.

At least one letter should be primarily concerned with the candidate's teaching. In addition, it is recommended that applicants submit the electronic application form which is available from our World Wide Web Employment Opportunities page:

*<http://www.math.toronto.edu/jobs/>*

To insure full consideration, this information should be received by **December 1, 1998**.

*In accordance with Canadian Immigration requirements, priority will be given to Canadian citizens and permanent residents. In accordance with its Employment Equity Policy, the University of Toronto encourages applications from qualified women or men, members of visible minorities, aboriginal peoples and persons with disabilities.*

*Further information about academic positions in the Department of Mathematics is available on the World Wide Web by accessing the above URL.*

**THE UNIVERSITY OF TORONTO**  
**Department of Mathematics**  
**Tenure-Stream Appointment in Algebra and Number Theory**

The University of Toronto solicits applications for a tenure-stream appointment in the fields of Algebra and Number Theory.

The appointment is at the downtown (St. George) campus at the level of Assistant Professor, to begin July 1, 1999. Candidates are expected to have demonstrated excellence in both teaching and research after the Ph.D.; in particular, a candidate's research record should show clearly the ability to make significant original and independent contributions to Mathematics. Salary commensurate with experience.

Applicants should send their complete C.V. including a list of publications, a short statement describing their research programme, and all appropriate material about their teaching. They should also arrange to have at least four letters of reference sent directly to Search Committee, Department of Mathematics, University of Toronto, Toronto, Canada M5S 3G3.

At least one letter should be primarily concerned with the candidate's teaching. In addition, it is recommended that applicants submit the electronic application form which is available from our World Wide Web Employment Opportunities page:

*<http://www.math.toronto.edu/jobs/>*

To insure full consideration, this information should be received by **December 1, 1998**.

*In accordance with Canadian Immigration requirements, priority will be given to Canadian citizens and permanent residents. In accordance with its Employment Equity Policy, the University of Toronto encourages applications from qualified women or men, members of visible minorities, aboriginal peoples and persons with disabilities.*

*Further information about academic positions in the Department of Mathematics is available on the World Wide Web by accessing the above URL.*

**THE UNIVERSITY OF TORONTO**  
**Department of Mathematics**  
**Tenure-Stream Appointment in**  
**Applied Mathematics - Computational Science**

The Department of Mathematics, University of Toronto solicits applications for a tenure-stream appointment for a mathematician working in the area of Applied Mathematics (Computational Science).

The appointment is at the downtown (St. George) campus at the level of Assistant Professor, to begin July 1, 1999. Candidates are expected to have demonstrated excellence in both teaching and research after the Ph.D.; in particular, a candidate's research record should show clearly the ability to make significant original and independent contributions to mathematics. Salary commensurate with experience.

Applicants should send their complete C.V. including a list of publications, a short statement describing their research programme, and all appropriate material about their teaching. They should also arrange to have at least four letters of reference sent directly to the Search Committee, Department of Mathematics, University of Toronto, Toronto, Canada M5S 3G3.

At least one letter should be primarily concerned with the candidate's teaching. In addition, it is recommended that applicants submit the electronic application form which is available from our World Wide Web Employment Opportunities page:

*<http://www.math.toronto.edu/jobs/>*

To insure full consideration, this information should be received by **December 1, 1998**.

*In accordance with Canadian Immigration requirements, priority will be given to Canadian citizens and permanent residents. In accordance with its Employment Equity Policy, the University of Toronto encourages applications from qualified women or men, members of visible minorities, aboriginal peoples and persons with disabilities.*

*Further information about academic positions in the Department of Mathematics is available on the World Wide Web by accessing the above URL.*

**THE UNIVERSITY OF TORONTO**  
**Department of Mathematics**  
**Tenure-Stream Appointment in Applied Mathematics**

The Department of Mathematics, University of Toronto solicits applications for a tenure-stream appointment for a mathematician working in the area of Applied Mathematics.

The appointment is at the downtown (St. George) campus at the level of Assistant Professor, to begin July 1, 1999. Candidates are expected to have demonstrated excellence in both teaching and research after the Ph.D.; in particular, a candidate's research record should show clearly the ability to make significant original and independent contributions to mathematics. Salary commensurate with experience.

Applicants should send their complete C.V. including a list of publications, a short statement describing their research programme, and all appropriate material about their teaching. They should also arrange to have at least four letters of reference sent directly to the Search Committee, Department of Mathematics, University of Toronto, Toronto, Canada M5S 3G3.

At least one letter should be primarily concerned with the candidate's teaching. In addition, it is recommended that applicants submit the electronic application form which is available from our World Wide Web Employment Opportunities page:

*<http://www.math.toronto.edu/jobs/>*

To insure full consideration, this information should be received by **December 1, 1998**.

*In accordance with Canadian Immigration requirements, priority will be given to Canadian citizens and permanent residents. In accordance with its Employment Equity Policy, the University of Toronto encourages applications from qualified women or men, members of visible minorities, aboriginal peoples and persons with disabilities.*

*Further information about academic positions in the Department of Mathematics is available on the World Wide Web by accessing the above URL.*

**THE UNIVERSITY OF TORONTO**  
**Department of Mathematics**  
**Tenure-Stream Appointment in Algorithmic Mathematics and Theoretical Computer Science**

The University of Toronto solicits applications for a tenure-stream appointment in the field of Algorithmic Mathematics and Theoretical Computer Science, including Complexity and Effective Methods in Scientific Computation. The position is subject to budgetary approval.

The appointment is at the downtown (St. George) campus at the level of Assistant Professor, to begin July 1, 1999. This will be a joint appointment between the Department of Mathematics (75%) and the Department of Computer Science (25%). Candidates are expected to have demonstrated excellence in both teaching and research after the Ph.D.; in particular, a candidate's research record should show clearly the ability to make significant original and independent contributions to Mathematics. Salary commensurate with experience.

Applicants should send their complete C.V. including a list of publications, a short statement describing their research programme, and all appropriate material about their teaching. They should also arrange to have at least four letters of reference sent directly to Search Committee, Department of Mathematics, University of Toronto, Toronto, Canada M5S 3G3.

At least one letter should be primarily concerned with the candidate's teaching. In addition, it is recommended that applicants submit the electronic application form which is available from our World Wide Web Employment Opportunities page:

*<http://www.math.toronto.edu/jobs/>*

To insure full consideration, this information should be received by **December 1, 1998**.

*In accordance with Canadian Immigration requirements, priority will be given to Canadian citizens and permanent residents. In accordance with its Employment Equity Policy, the University of Toronto encourages applications from qualified women or men, members of visible minorities, aboriginal peoples and persons with disabilities.*

*Further information about academic positions in the Department of Mathematics is available on the World Wide Web by accessing the above URL.*

**THE UNIVERSITY OF TORONTO**  
**Department of Mathematics**  
**Limited Term Assistant Professorships**

The Department invites applications for one or more limited term Assistant Professorships which may, subject to budgetary approval, become available at the St. George (downtown), Scarborough or Erindale campus, for a period of one to three years, beginning July 1, 1999. Duties consist of teaching and research, and candidates must demonstrate clear strength in both. Preference will be given to candidates with recent doctoral degrees. Salaries commensurate with qualifications.

Applicants should send their complete C.V. including a list of publications, a short statement describing their research programme, and all appropriate material about their teaching. They should also arrange to have at least four letters of reference sent directly to the Search Committee, Department of Mathematics, University of Toronto, Toronto, Canada M5S 3G3.

At least one letter should be primarily concerned with the candidate's teaching. In addition, it is recommended that applicants submit the electronic application form which is available on our World Wide Web Employment Opportunities page:

<http://www.math.toronto.edu/jobs/>

To insure full consideration, this information should be received by **December 1, 1998**.

*In accordance with Canadian Immigration requirements, priority will be given to Canadian citizens and permanent residents. In accordance with its Employment Equity Policy, the University of Toronto encourages applications from qualified women or men, members of visible minorities, aboriginal peoples and persons with disabilities.*

*Further information about academic positions in the Department of Mathematics is available on the World Wide Web by accessing the above URL.*

**UNIVERSITY OF OTTAWA / UNIVERSITÉ D'OTTAWA**  
**Department of Mathematics and Statistics/Département de mathématiques et de statistique**

The Department of Mathematics and Statistics of the University of Ottawa invites applications from recent Ph.D.'s for one tenure-track position at the assistant professor level beginning July 1, 1999. Applications in all areas of mathematics and statistics are invited. The department's priorities are modern applied mathematics and statistics. In accordance with Canadian immigration requirements, this advertisement is directed to Canadian citizens and permanent residents. Applicants should send a curriculum vitae and have three letters of recommendation sent to Wulf Rossmann, Chairman, Department of Mathematics and Statistics, University of Ottawa, Ottawa, ON Canada, K1N 6N5 by **January 15, 1999**. Conditions of employment are set by a collective agreement. Employment equity is University policy and the University strongly encourages applications from women.

The University of Ottawa has a student population of over 25000. It has a full range of academic and professional programs, several research institutes, and is near the federal government with all its agencies and laboratories. The region is home to Canada's biggest concentration of high-tech companies.

The Department of Mathematics and Statistics has 28 full-time faculty members, more than 80% of whom hold national research grants. Shared computing facilities (Sun, RS/6000) with mathematical and statistical software are available for the successful applicant. New tenure-track appointees begin with reduced teaching and administrative loads and usually receive a start-up grant. Please consult <http://www.uottawa.ca/science/mathstat/> for further information.

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Le Département de mathématiques et de statistique de l'Université d'Ottawa met au concours un poste menant à la permanence au niveau de professeur adjoint. Entrée en fonction: le 1er juillet 1999. Pour poser sa candidature, il faut avoir reçu, récemment, un doctorat en mathématiques ou en statistique. Les candidates et candidats de tout domaine de mathématiques ou de la statistique seront considérés. La priorité du département se situe en mathématiques appliquées modernes et en statistique. Conformément aux exigences prescrites en matière d'immigration au Canada, cette annonce s'adresse aux citoyens canadiens et aux résidents permanents. Envoyer son c.v. ainsi que trois lettres de recommandation à Wulf Rossmann, Directeur, Département de mathématiques et de statistique, Université d'Ottawa, Ottawa, ON, Canada, K1N 6N5. La date limite pour la réception des candidatures est **le 15 janvier 1999**. Les conditions d'emploi suivent les dispositions d'une convention collective. L'Université a une politique d'égalité en matière d'emploi et encourage fortement les demandes de la part des femmes.

L'Université d'Ottawa offre à plus de 25,000 étudiants une gamme complète de programmes d'études tant académiques que professionnels. En plus du gouvernement fédéral, de ses agences et de ses laboratoires, la région abrite la plus grande concentration d'entreprises de haute technologie au pays.

Le département de mathématiques et de statistique est composé de 28 professeurs dont plus de 80% reçoivent des fonds de recherche d'organismes nationaux. Des ordinateurs (Sun, RS/6000) munis de logiciels de mathématiques et de statistique sont disponibles. De plus, les nouveaux titulaires de poste menant à la permanence reçoivent un octroi de démarrage ainsi qu'une charge administrative et d'enseignement réduite. Pour plus de renseignement voir <http://www.uottawa.ca/science/mathstat/>.

**McMASTER UNIVERSITY  
DEPARTMENT OF MATHEMATICS AND STATISTICS**

**APPLIED MATHEMATICS**

The Department of Mathematics & Statistics, McMaster University, invites applications for a tenure track Assistant or Associate Professorship starting July 1, 1999.

Candidates should have a Ph.D. and a research record of high quality in a major area of Applied Mathematics (including Mathematical Physics), as well as demonstrated interest and ability in teaching. The salary and rank will be based on qualifications and experience.

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

In accordance with Canadian Immigration requirements, this advertisement is directed to Canadian citizens and permanent residents.

Applications, including curriculum vitae and three letters of reference, should be received before **December 1, 1998** by:

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

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**McMASTER UNIVERSITY  
DEPARTMENT OF MATHEMATICS AND STATISTICS**

**ANALYSIS**

The Department of Mathematics & Statistics, McMaster University, invites applications for a tenure track Assistant Professorship starting July 1, 1999.

Candidates should have a Ph.D. and a research record of high quality in a major area of Analysis, as well as demonstrated interest and ability in teaching. The salary and rank will be based on qualifications and experience.

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

Applications, including curriculum vitae and three letters of reference, should be received before **December 1, 1998** by:

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

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**University of Alberta  
Edmonton**

## Department of Mathematical Sciences

The Department of Mathematical Sciences at the University of Alberta invites applications for two tenure-track positions starting July 1, 1999. The positions require a PhD and will be initially considered at the Assistant Professor level with the salary range \$40,638 - \$57,510.

### Functional Analysis (FA-99)

A position is available for an outstanding candidate in functional analysis. We are particularly interested in a mathematician working in operator spaces, with an emphasis on Banach space and C\* algebra aspects of the theory. Functional analysts in areas such as abstract harmonic analysis, geometric functional analysis, probabilistic methods in Banach spaces and in harmonic analysis, will also be considered.

### Postdoctoral Positions

One to three postdoctoral positions may be available within the areas of stochastic processes, scientific computation, partial differential equations, mathematical modeling, and inference. One or more postdoctoral positions may be available in statistics, generalized linear models, survival analysis, missing data analysis and random effects models. These positions will be for one to two years, commencing any time between September 1998 and April 1999, with a competitive compensation package and a travel budget.

Applicants for all positions are expected to possess a strong research record, outstanding promise for future research, excellent communication skills and leadership potential. The successful candidate for tenure-track positions must have a

commitment to graduate and undergraduate education in mathematical sciences. The Department of Mathematical Sciences has 64 faculty specializing in algebra, fluid dynamics, mathematical statistics, analysis, differential equations, stochastic processes, geometry, numerical analysis, and optimal statistical designs. (For further information, please see <http://www.math.ualberta.ca>.)

In accordance with Canadian immigration requirements, this advertisement is directed to Canadian citizens and permanent residents. If suitable Canadian citizens and permanent residents cannot be found for the position, other individuals will be considered.

Applications should include a curriculum vitae, research plan, and a teaching profile outlining experience and/or interests. Candidates should arrange for at least three confidential letters of reference to be sent to:

S.D. Riemenschneider, Chair  
Department of Mathematical Sciences  
University of Alberta  
Edmonton, Alberta T6G 2G1 Canada

The closing date for the tenure track position is Friday, January 8, 1999. Postdoctoral applications will be considered on an ongoing basis. Early applications are encouraged.

*The University of Alberta is committed to the principle of equity in employment. As an employer we welcome diversity in the workplace and encourage applications from all qualified men and women, including Aboriginal peoples, persons with disabilities, and members of visible minorities.*

UNIVERSITY OF ALBERTA  
...it makes sense.

## MATH CONNECTION

### News from Departments

**University of British Columbia:** Martin Barlow has been elected a Fellow of the Royal Society of Canada.

**University of Prince Edward Island:** Appointment: Ahmed Tawfik(Computer Science).

**University of Victoria:** Dr. Julie

Zhou (Statistics) and Dr. Roderick Edwards (Applied Mathematics, Neural Networks) have been appointed assistant professors. Dr. Roger Davidson has retired.

#### University of Regina:

Promotions: Judith McDonald has been promoted Associate Professor.

Ejaz Ahmed has been promoted Full Professor.

Appointments: Roberta La Haye (Instructor III); Julianna Erljman (Assistant Professor); and Claude Tardif (Assistant Professor, 1 yr.term).

Retirements: Joanne McDonald and Ian McDonald have retired.



**University of Alberta**  
Edmonton

## Department of Mathematical Sciences

### Mathematical Finance Position (MF-99)

The Department of Mathematical Sciences, University of Alberta, invites applications for a tenure-track Assistant Professorship in Mathematical Finance with some expertise in Actuarial Science starting July 1, 1999. The position requires a PhD and will be initially considered at the Assistant Professor level with the salary range \$40,638 - \$57,510.

The successful candidate must be able to teach graduate courses on the modelling of the term structure of interest rates and on the mathematics of derivative securities. Moreover, the successful candidate must be willing to teach undergraduate courses in actuarial mathematics. Expertise in the areas of probability theory, stochastic analysis, stochastic differential equations, point processes, or stochastic control is highly desirable.

Applicants are expected to possess a strong research record, outstanding promise for future research, excellent communication skills and leadership potential. The successful candidate must have a commitment to graduate and undergraduate education in mathematics and statistics. The Department of Mathematical Sciences has 64 faculty specializing in algebra, fluid dynamics, mathematical statistics, analysis, differential equations, stochastic processes, geometry, numerical analysis, and optimal statistical designs. (For further information, please see <http://www.math.ualberta.ca>.)

Applications should include a curriculum vitae, research plan, and a teaching profile outlining experience and/or

interests. Candidates should arrange for at least three confidential letters of reference to be sent to:

S.D. Riemenschneider, Chair  
Department of Mathematical Sciences  
University of Alberta  
Edmonton, Alberta T6G 2G1  
Canada

Closing date for applications is Friday, January 8, 1999 or until a suitable candidate is found. Early applications are encouraged.

### Postdoctoral Positions

One to three postdoctoral positions may be available within the areas of stochastic processes, scientific computation, partial differential equations, mathematical modeling, and inference. One or more postdoctoral positions may be available in statistics, generalized linear models, survival analysis, missing data analysis and random effects models. These positions will be for one to two years, commencing any time between September 1998 and April 1999, with a competitive compensation package and a travel budget. Applications will be considered on an ongoing basis.

*The University of Alberta is committed to the principle of equity in employment. As an employer we welcome diversity in the workplace and encourage applications from all qualified women and men, including Aboriginal peoples, persons with disabilities, and members of visible minorities.*

UNIVERSITY OF ALBERTA  
...it makes sense.

## CALENDAR OF EVENTS / CALENDRIER DES ÉVÉNEMENTS

### OCTOBER 1998

**5–10** Workshop on Hydrodynamic Limits (Fields Institute)  
*probability@fields.utoronto.ca;*  
<http://www.math.yorku.ca/Probability/Fields.html>

**7–11** International Conference on Operator Theory and its Applications to Scientific and Industrial Problems  
(Winnipeg, Manitoba) *insmath@cc.umanitoba.ca;*  
<http://www.iims.umanitoba.ca>

**25–29** Workshop on Monte Carlo Methods (Fields Institute)

### OCTOBRE 1998

*probability@fields.utoronto.ca;*

<http://www.math.yorku.ca/Probability/Fields.html>

### DECEMBER 1998

**8–12** International Commission on Mathematical Instruction (ICMI) Study Conference (Singapore)  
<http://elib.zib.de/IMU/ICMI/bulletin/43/Study.html>

**13–15** CMS Winter Meeting / Réunion d'hiver de la SMC (Queen's University, Kingston)  
*Monique Bouchard: meetings@cms.math.ca*

<b>JANUARY 1999</b>	<b>JANVIER 1999</b>	Saskatchewan) <i>fvk@usask.ca; http://math.usask.ca/fvk/Valth.html</i>
<b>13–16</b> Joint Mathematics Meetings (San Antonio, Texas)		
<i>A.H. Daly: AMS, meet@math.ams.org</i>		
<b>MAY 1999</b>	<b>MAI 1999</b>	<b>DECEMBER 1999</b>
<b>29–31 CMS Summer Meeting / Réunion d'été de la SMC</b>		<b>DÉCEMBRE 1999</b>
<b>(Memorial University of Newfoundland, St. John's)</b>		<b>11–13 CMS Winter Meeting / Réunion d'hiver de la SMC</b>
<i>Monique Bouchard: meetings@cms.math.ca</i>		<b>(Université de Montréal)</b>
<b>29–June 4 Moonshine in '99 (Montreal, Quebec)</b>		<i>Monique Bouchard: meetings@cms.math.ca</i>
<i>mckay@vax2.concordia.ca</i>		
<b>JUNE 1999</b>	<b>JUIN 1999</b>	<b>JUNE 2000</b>
<b>4–8 CMESG Meeting (Brock University, St. Catherine's)</b>		<b>JUIN 2000</b>
<b>6–9 Annual Meeting of the Statistical Society of Canada</b>		<b>9–13 CMS Summer Meeting / Réunion d'été de la SMC</b>
<b>(Regina, Saskatchewan)</b>		<b>(McMaster University)</b>
<b>14–19 14th Householder Symposium on Numerical Linear</b>		<i>Monique Bouchard: meetings@cms.math.ca</i>
<b>Algebra (Whistler, British Columbia)</b>		<b>4–7 Annual Meeting of the Statistical Society of Canada</b>
<i>varah@cs.ubc.ca; http://roadmap.ubc.ca/hholder/</i>		<b>(Ottawa, Ontario)</b>
<b>JULY 1999</b>	<b>JUILLET 1999</b>	<b>12–15 Integral Methods in Science and Engineering (Banff,</b>
<b>5–9 4th International Congress on Industrial and Applied</b>		<b>Alberta)</b>
<b>Mathematics (Edinburgh, Scotland)</b>		<i>Peter.Schiavone@ualberta.ca</i>
<i>geninfo.iciam@meetingmakers.co.uk;</i>		
<i>http://www.atjs.ed.ac.uk/conferences.icicam99/</i>		
<b>AUGUST 1999</b>	<b>AOÛT 1999</b>	<b>SEPTEMBER 2000</b>
International Conference on Valuation Theory and its Applications, Conf. dedicated to Paulo Ribenboim (University of		<b>SEPTEMBRE 2000</b>
		<b>22–24 American Mathematical Society Central Section meetings</b>
		<b>(University of Toronto)</b>
		<i>http://www.ams.org/meetings/</i>
		<b>DECEMBER 2000</b>
		<b>DÉCEMBRE 2000</b>
		<b>CMS Winter Meeting / Réunion d'hiver de la SMC</b>
		<b>(University of British Columbia)</b>
		<i>Monique Bouchard: meetings@cms.math.ca</i>

## RATES AND DEADLINES / TARIFS ET DATES LIMITES

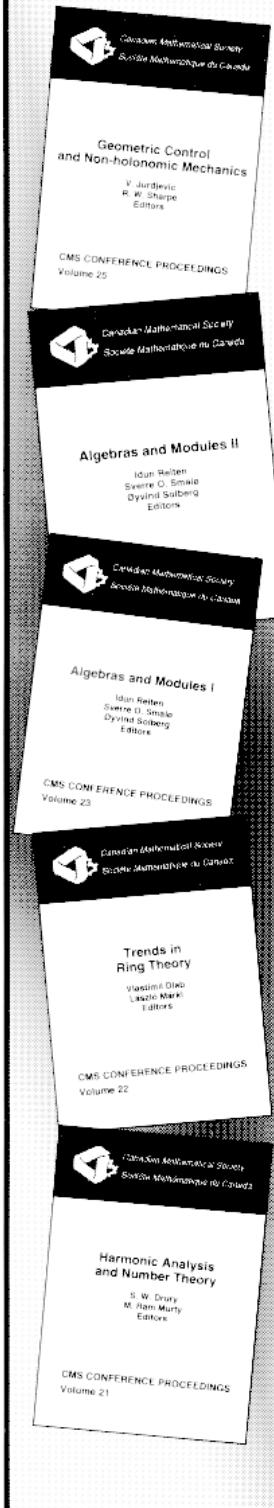
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