

CMS

NOTES

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In this issue / Dans ce numéro

Editorial	2
How to give a good colloquium	3
Du bureau du président	6
Education Notes	7
Research Notes	11
Meetings / Réunions	
CMS Winter 1999 Meeting Réunion d'hiver 1999 de la SMC.....	16
Registration form / Formulaire d'inscription	27
Abstract Form / Formulaire de résumé	29
31st Canadian Mathematical Olympiad	32
1999 Endowment Grants Com- petition / Concours de bourses du fonds de dotation 1999	33
Call for Nominations / Appel de Candidatures	34
News from Departments	36
Obituary / Avis de décès	37
Calendar of events / Calendrier des événements	38

FROM THE PRESIDENT'S DESK



Richard Kane

(voir la page 6 pour la version française)

I am now in my second and final year as CMS President. In the report on my first year, appearing in last April's Notes, I commented that I have been struck by the strong pattern of growth and change displayed by the CMS. Sometimes changes occur incrementally, other times rather dramatic changes can occur. Notably it has become the pattern that, at every CMS meeting, a number of innovations are either initiated or finalized. The CMS meeting in St. John's, Newfoundland on May 29-June 1 certainly continued that pattern. This article will report on several important developments considered by the Executive and Board at that meeting.

I want to begin, however, by commenting on the meeting itself. The St John's meeting continued our pattern of increasingly high participation levels; in fact, it produced a new record

turnout for a summer meeting with 264 registrants. I would like to congratulate the Meeting Directors, Hermann Brunner and Richard Charron, for all their work. Memorial has a significant track record of generous support of CMS activities and this meeting was no exception. There were many mathematicians from Memorial who volunteered their time and energy in organizing various aspects of the meeting. In particular, the sessions reflected this local participation. I am sure that I speak for many participants in saying how much we enjoyed, not only the scientific aspects of the meeting, but also the entire visit to St. John's and the surrounding area. At the risk of overstating the powers of the Memorial mathematicians, I would particularly like to thank them for arranging an early visit of the humpback whales to the shores of Newfoundland.

As I said, a number of important decisions were taken at the St. John's meeting. First of all, it marked the formal ratification of our new Executive. Jonathan Borwein began his term as President Elect and he will be taking over as President next June. The four new Vice Presidents are Margaret Beattie (Atlantic Canada), Francois Bergeron (Quebec), Tom Salisbury (Ontario) and Keith Taylor (Western Canada). This is a very experienced and balanced group of individuals and I thank them all for being willing to serve on this committee.

(see PRESIDENT—page 5)

CMS NOTES
NOTES DE LA SMC

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EDITORIAL



S. Swaminathan

My colleague Heydar Radjavi told me the following story on his return from a workshop on linear algebra at Bled in Slovenia. He was taking a walk along with some other mathematicians around a beautiful lake in the area. The group stopped to watch a family of baby ducks following their mother closely. A debate arose about the number of ducklings in the family. Since they were moving pretty close together it was hard to take a count. One mathematician said that there were eleven, another said twelve while a third claimed that there were thirteen ducks. An elderly couple sitting on a bench nearby were amused by this and the man said, "Math is obviously not one of your strong points, is it?" Heydar explained, "Actually we are attending a math conference here." And the man quickly replied, "That figures!"

This story is typical of the all-too-familiar public perception of mathematics as nothing more than counting. A lay person is less uneasy when you describe mathematics as science of numbers. This reminds me of the recent book by Keith Devlin entitled *Life by the Numbers*, published by John Wiley. Based on a television series by the same name the book describes in easy going style how mathematics pervades everyday life. The book is not about numbers but about the deeper abstract aspects of mathematics which naturally

find a place in everyday matters. Dealing with both classical and modern research it explains how a mathematician looks at phenomena in the world, strips away complexity, focusses on the underlying structure or pattern and tells you how, for example, a leopard gets its spots or a skater performs a triple axel or how knot theory can be used to fight viruses. There are eight chapters covering many interesting areas of present day life ranging from patterns and perspectivity to polls and polio vaccination.

Thus numbers may be basic to mathematics but even for a topic like the growth of national economies, which one would think is more about numbers, it is the topology of the 'cones' of the economist Gracelia Chichilnisky which helps in understanding how markets operate. In her opinion mathematics works for today's society like fossil fuels worked for industrial society!

Mon collègue Heydar Radjavi m'a raconté l'histoire suivante à son retour de Bled, en Slovénie, où il assistait à un atelier sur l'algèbre linéaire. Avec quelques autres mathématiciens, il se promenait autour d'un magnifique lac de la région. Le groupe est arrêté pour observer une couvée de canetons qui suivaient leur mère de près. Quelqu'un a demandé combien de petits comptait la famille, car ils étaient si près les uns des autres qu'il était difficile de les compter. Un mathématicien a dit qu'il en comptait onze, un autre, douze et un troisième, treize. Un couple âgé assis sur un banc près d'eux trouvait la situation bien drôle. L'homme dit : « De toute évidence, vous n'êtes pas très forts en maths, n'est-ce pas? » Heydar de répliquer : « En fait, nous sommes ici pour assister à un congrès mathématique. » Et l'homme s'empressa de répondre : « Ah! Ça explique tout! »

(voir EDITORIAL—page 5)

How to give a good colloquium

John E. McCarthy, Washington University

The author would like to thank Steven Krantz for many valuable suggestions. Most colloquia are bad. They are too technical, and aimed at too specialized an audience. Consequently, most mathematicians skip colloquia in areas not in their general field (unless the speaker is famous: mathematicians are very class-conscious). So when a conscientious speaker actually listens to the routinely ignored advice to prepare a lecture “accessible to graduate students”, he or she looks out on the audience and sees only experts in the field, and feels stupid for preparing an elementary lecture.

But the colloquium should be the center of the department’s week, the time when all the faculty and graduate students get together to learn of somebody else’s perspective on mathematics, and to broaden their own. Many person-hours go into listening to colloquia; the speaker has an obligation to not waste them.

Here are some suggestions on giving a colloquium. They are guidelines, not absolute rules.

1. *Don’t be intimidated by the audience.*

Just because John von Neumann is in the audience does not mean you have to aim the lecture at him. All too often one hears remarks like “I’m sure everybody here knows ...”. What this really means is that the speaker knows 3 members of the audience in his or her specialty, and to avoid the risk that they find parts of the talk trivial, the speaker ignores the remainder of the audience. The speaker also incorrectly assumes that other members of the department must have at least a nodding acquaintance with their colleagues’ work.

2. *Don’t try to impress the audience with your brilliance.*

Making the talk complicated so that your work appears profound is a

greater sin than being intimidated, because it stems from vanity rather than insecurity. The effect is just as bad: the speaker presupposes that the audience knows what a class number field, bornology and Koszul complex are, and loses everyone. Such a talk is often preceded by an “apology to the experts”, just to make sure everyone realizes that this stuff is all trivial to the great mind at the blackboard.

3. *The first 20 minutes should be completely understandable to graduate students.*

Be honest when deciding what a graduate student knows. It does not mean that the first 20 minutes should be understandable to a student who knew everything you did just before you got your Ph.D., plus a few things you learned since then but feel you ought to have known; it means a student who just scraped by the required coursework in your area, and went into a different field. So you can assume they know what L^p is, but not what a Sobolev space or pseudo-differential operator is; you can assume they know what a manifold is, but not what Poincaré duality is; you can assume they know what a field extension is, but not what an induced representation is.

4. *Carry everyone along.*

The rest of the talk, except perhaps for the last 5 minutes, should be understandable in outline, if not in every detail, by an alert (but not brilliant) student. This means giving informal descriptions along with (or instead of) formal definitions; explaining examples of what you are talking about; and periodically regrouping so that the audience can understand what the main idea is. Even the theorems do not have to be stated precisely: you can add the hypothesis that something be “nice” without saying exactly what “nice” means.

5. *Talk about examples.*

Choose an example that illustrates the main point of the theorem. If you have a theorem that applies to all strictly pseudo-convex domains, but is non-trivial on the ball, just talk about the ball. Don’t strive for generality. And if there are no examples that you can explain in the course of the talk, then the theorem is probably not suitable for a colloquium talk.

6. *Prove only tautologies.*

Often the original definition of an object is not the way you want to think about it as your talk develops. It is useful to prove the (perhaps trivial) equivalence of two different ways of looking at something, so the audience can actually see the connection rather than having to take it on faith.

Proving a real theorem, though, is pointless — nobody will understand the proof, not even those in the audience whom you assume are experts.

7. *Put the theorem in context.*

Discuss the history of the problem - how it is connected to earlier results, and how it relates to the major problems in the field.

8. *Pay attention to the audience.*

When teaching calculus, you know (or should) that looking at students’ faces is a good way of gauging how they are following the material, and whether you need to slow down, or to go back over what you have just done. Do the same when giving a colloquium (and just because one person in the front row is nodding in agreement does not mean that everyone is following).

I was once at a colloquium where, 3 minutes into it, a member of the audience asked “could you define a von Neumann algebra please?” The audience member, as the speaker knew, was an expert in von Neumann algebras. The question clearly meant “You are pitching this talk at too high a level – make it more elementary.” Unfortu-

nately, the speaker did not get the hint, gave a quick definition, and proceeded to give a very erudite talk that at most 2 of the 40 people in the audience could follow at all.

9. *Don't introduce too many ideas.*

I once went to a talk (given to an undergraduate audience), in which the speaker started out by defining a manifold, and 30 minutes later was talking about Chern classes. This was ridiculous. Even though he defined everything logically necessary to understand the definition, nobody who started out not knowing what a manifold was could have absorbed all the ideas necessary to understand what a Chern class is.

We know that, when teaching calculus, one cannot on the first day of class give the definition of a limit, derivative and integral and go on to prove the fundamental theorem of calculus. So, too, every member of the colloquium audience can only take in a couple of new concepts. If you introduce too many, the audience will cease to understand you.

10. *Write an abstract.*

The main purpose of the abstract is to advertise your talk and to attract people's interest. It should also indicate the level at which the talk will be pitched, and what prerequisites will be assumed. Be honest — if you say your talk is accessible to graduate students, make sure that it is.

11. *Find out in advance how long the colloquium is, and prepare accordingly.*

Some are 50 minutes, some are 60 minutes (ours are 57 minutes long, after the audience settles down and the introduction is made). It is all right to end 5 minutes early; it is not all right to end 5 minutes late.

12. *Don't use an overhead projector.*

It is possible to give a good talk with

an overhead projector, but most people are better off without them.

Even if you can resist the temptation to go too fast, there is still the insuperable problem that material does not stay around long enough. During a blackboard talk, if I forget what T_1 is, or was not paying attention when it was defined, I can look at the other side of the board and be reminded. In a well-designed lecture hall with plenty of blackboard space, you should have to erase something only after it has been on the board for at least 30 minutes; the important things can stay unerased for the whole lecture.

If you have complicated pictures to show, then you may be forced to use an overhead projector. Try to set it up on one side, so that you still have plenty of blackboard space for the non-pictorial part of your talk.

13. *You do not have to talk about your own work.*

There is much to be said for talking about somebody else's work. Unless you happen to have recently revolutionized the field, your latest theorem is probably pretty technical, and by the time you explain everything necessary to understand the statement, you will have lost much of the audience. But if you are willing to talk about somebody else's work, you can (i) choose a more important theorem and (ii) more easily simplify it to get the big idea across (if you sweated for 6 months to get the extra epsilon in the theorem, you will want to include it; if somebody else sweated for 6 months, you can easily drop it).

It is, of course, rare for a colloquium speaker not to mention his or her own work, and it is perfectly legitimate to want to let the audience know what you have been doing. But you should give a broad overview of the field, and wait till the end to describe your latest contribution.

I end with some advice to audience members and colloquium organizers.

1. *Don't be too polite.*

I have heard terrible colloquia from senior mathematicians, who have been giving bad talks for 30 years. I can only conclude that they do not realize their talks are bad. Why? Because afterwards, people come up politely and say "Nice Talk", thinking it is a harmless white lie. It is not: it means that the next unfortunate audience will have to sit through a bad talk, the speaker obliviously thinking that he or she is doing a great job.

2. *Subsidize graduate students who dine with the speaker.*

An important part of the colloquium is the post-colloquium dinner, where people chat with the speaker about their departments, exchange gossip, and discuss mathematics. A relatively quiet restaurant that facilitates group discussions should be chosen.

It is good for graduate students to come to these dinners — it is part of joining the mathematical community. Faculty should ensure that graduate students can afford to do so by subsidizing their share of the bill.

3. *Consider asking the speaker to give two talks, a seminar and a colloquium.*

In the seminar, the speaker can describe his or her latest theorems in detail, and what clever ideas went into the proof. At the colloquium there is then less incentive to try to impress the audience.

It is an honour to be invited to give a colloquium. It is not the occasion to tell a few of your friends the details of your work. It is your opportunity to show mathematicians in other areas and other fields the exciting work that is going on in your area. Seize this opportunity.

(EDITORIAL—continué de page 2)

histoire est tout à fait caractéristique de la perception publique générale selon laquelle les mathématiques se limitent au fait de compter. Un non-initié est plus à l'aise si on lui décrit les mathématiques comme la science des chiffres. Voilà qui me fait penser au livre de Keith Devlin intitulé *Life by Numbers* publié récemment chez John Wiley. Basé sur une série télévisée du même nom, ce livre décrit, dans un style simple, comment les mathématiques sont présentes dans la vie de tous les jours. Il n'y est pas question

de chiffres, mais plutôt des côtés plus abstraits et cachés des mathématiques, qui se manifestent naturellement au quotidien. L'auteur se base sur les recherches classiques et modernes pour expliquer comment un mathématicien observe un phénomène, en élimine la complexité, se concentre sur la structure ou le modèle sous-jacent et arrive à expliquer, par exemple, comment apparaissent les taches d'un léopard, comment un patineur arrive à faire un triple axel ou comment on peut utiliser la théorie des noeuds pour combattre les virus. L'ouvrage compte huit chapitres qui portent sur de nombreux aspects in-

téressants de la vie courante actuelle, qu'il s'agisse de modèles et de perspectives, de sondages ou du vaccin contre la polio.

Ainsi, les chiffres sont peut-être à la base des mathématiques, mais même quand on pense à un sujet comme la croissance des économies mondiales qui, croirait-on, est directement lié aux chiffres, c'est la topologie des « cônes » de l'économiste Gracelia Chichilnisky qui nous aide à comprendre le fonctionnement des marchés. À son avis, les mathématiques sont à la société d'aujourd'hui ce que les carburants fossiles étaient à la société industrielle!

(PRESIDENT—continued from page 1)

I also want to acknowledge our departing Executive members: Kathy Heinrich, Lynn Batten, Eddy Campbell, Jacques Hurtubise and Richard Wood. They were a very effective and pleasant group with which to work. Kathy, in particular, finished six consecutive and constructive years of service on the Executive.

The Board also approved the appointment of Robert Quackenbush (Manitoba) as Managing Editor of CMS publications for the three year term July 1, 1999 - June 30, 2002. Bob's appointment reflects a partial re-orientation of the Executive Director duties. It was agreed last year when we renewed Graham Wright's term as Executive Director that we would remove the Managing Editor duties from Graham's responsibilities with the expectation that this will allow him more time for fundraising and promotional activities.

A number of significant decisions were taken at St. John's with respect to our standing committee structure. The Endowment Grants Committee (EGC), which had been approved by the Board last December, might be described as having been "licenced to practice". The Board approved the first slate of EGC

members and also guaranteed that the Committee would have at least \$30,000 (of investment income from the Endowment Fund) to distribute in its first competition. The final figure will be determined by the Finance Committee in October. The competition will take place this fall with the decisions to be finalized at the Winter meeting at Montreal. The first EGC will consist of: Jim Timourian (Alberta) as chair, plus George Bluman (UBC), Kathryn Hare (Waterloo), Tom Ransford (Laval) and Richard Wood (Dalhousie).

The creation of a new Student Committee was also approved by the Board. Although this will be a standing committee of the CMS it is really quasi-independent. It grew out of the Canadian Undergraduate Mathematics Conference and represents a growing sense of identity among the CUMC students. It has been integrated into the CMS, at the request of the students, in order to enable us to better provide support. Although our Nominating Committee will officially choose the members it is anticipated that the students themselves will have a significant voice in the choice of the Committee members.

And, for the first time, the CMS has also eliminated a Committee! The Board supported the dissolution of the Committee for Government Affairs.

The major responsibilities of this Committee over the past few years has been the Annual Survey and providing representatives to attend the meetings of several organizations located in the Ottawa area. These responsibilities will be reassigned to particular individuals appointed by the Executive.

An extensive discussion about CMS investment policy culminated at the St John's meeting. We have two segregated Investment Funds: the Endowment Fund and the Mathematical Olympiads Fund. Their current values are roughly \$1,500,000 and \$200,000. For the past two years (at least) the Finance Committee has been slowly formulating an approach to the handling of these investments. During the 90's we used the Investment Advisory Group (a combination of outside experts and CMS members of the Finance Committee) to make the decisions. It has been felt, particularly by members of the IAG, that we needed to pass beyond this volunteer approach to a more professional one and we also needed to better formulate our investment objectives. The Board approved several policy changes at St. John's which reflected this ongoing discussion. We will have TD Securities handle our segregated Investment Funds. This will be done via a "passive investment policy"

whereby our equity will be put into "indexed funds" designed to match the performance of key benchmarks, notably the Toronto TSE 300 and the Standard & Poor's 500.

As a final topic let me return to the theme of student support. As the new Student Committee suggests, this is an growth area for the CMS. We are trying to develop infrastructure for students activities at every level and we expect to see a number of devel-

opments during 1999-2000. At the high school level our already substantial enrichment program is expanding to include math camps (both national and regional) as a major new component. In addition, the first step in the development of an alumni association for students who have participated in the CMS Olympiad competitions over the past 20 years will occur next June with the first reunion of former IMO team members. At the undergradu-

ate and graduate level, the first "job-fairs" will take place at the 1999 Winter and 2000 Summer meetings this year. And a new CMS membership format for students will be discussed this year. The proposal is to extend membership to all graduate students in an electronic format. Such virtual membership would be free and would create a forum for communicating with students about relevant activities.

DU BUREAU DU PRÉSIDENT

(see page 1 for the English version)

Je suis présentement dans ma deuxième et dernière année à la présidence de la SMC. Dans mon rapport de l'an dernier, que vous pouvez lire dans les Notes du mois d'avril, je mentionnais avoir été frappé par la croissance et les changements vécus par la SMC sur tous les plans. Parfois, les changements se font progressivement; d'autres fois, il s'agit plutôt de changements radicaux. Il est devenu traditionnel que chaque réunion de la SMC voit un lot de projets soit amorcés, soit terminés. La réunion de la SMC de St. John's, à Terre-Neuve, du 29 mai au 1er juin, a allègrement poursuivi cette tradition. Cet article fait état des nombreux développements importants que le Conseil de direction et le Conseil d'administration ont étudiés à cette réunion.

Je voudrais d'abord parler de la réunion même. Encore une fois, le taux de participation a augmenté et a même établi un nouveau record pour une réunion d'été, avec ses 264 inscriptions. Je désire féliciter ici les directeurs de cette réunion, Hermann Brunner et Richard Charron, pour leur magnifique travail. Memorial affiche un dossier impressionnant sur le plan de son soutien généreux des activités de la SMC et cette réunion n'a pas fait exception. Un grand nombre de mathématiciens de Memorial ont bénévolement consacré temps et énergie à

l'organisation de cette réunion. Les sessions, en particulier, ont manifesté de cette participation locale. Je suis sûr que plusieurs participants joignent leur voix à la mienne pour exprimer combien nous avons apprécié non seulement les discussions scientifiques de cette réunion, mais également la visite de St John's et de ses environs. Au risque d'exagérer les pouvoirs de nos collègues mathématiciens de Memorial, je voudrais tout spécialement les remercier d'avoir organisé cette visite matinale aux rorquals à bosse, sur les rives de Terre-Neuve.

Plusieurs décisions importantes ont été prises à cette réunion de St John's. D'abord, il y a eu la ratification officielle de notre nouveau Conseil de direction. Jonathan Borwein amorce un mandat comme président désigné et assumera le poste de président en juin prochain. Les quatre nouveaux vice-présidents sont Margaret Beattie (Provinces atlantiques), François Bergeron (Québec), Tom Salisbury (Ontario) et Keith Taylor (Provinces de l'Ouest). Ce sont tous des gens très expérimentés et je les remercie de bien accepter de participer à ce comité. Je voudrais également souligner le départ de certains membres du Conseil : Kathy Heinrich, Lynn Batten, Eddy Campbell, Jacques Hurtubise et Richard Wood. Ils formaient un groupe très efficace avec qui il était fort

agréable de travailler. Je salue en particulier Kathy qui a mis fin à six années consécutives et constructives consacrées au Conseil de direction.

Le Conseil a également approuvé la nomination de Robert Quackenbush (Manitoba) au poste de rédacteur-gérant des publications de la SMC, du 1er juillet 1999 au 30 juin 2002. La nomination de ce dernier reflète bien la nouvelle orientation que le Conseil de direction imprime en partie à ses tâches. L'an dernier, au moment de renouveler le mandat de Graham Wright à titre de directeur exécutif, nous avons convenu de lui retirer la tâche de rédacteur-gérant, dans l'espoir qu'il pourrait ainsi accorder plus de temps aux activités promotionnelles et de financement.

Nous avons pris plusieurs décisions importantes en ce qui a trait à la structure de notre comité permanent. Tout d'abord, on peut dire que le Comité d'attribution des bourses du fonds de dotation (CABFD), approuvé l'an dernier par le Conseil d'administration en décembre dernier, a reçu son " permis de travail ". En effet, le Conseil a approuvé la première liste de membres du CABFD et a également garanti que le Comité recevrait au moins 30 000 \$ (provenant des revenus de placement du Fonds de dotation) à distribuer au moment du premier concours. Le Comité des finances en

déterminera le montant final en octobre prochain. Le concours aura lieu cet automne et les décisions seront prises à la réunion d'hiver, à Montréal. Le premier CABFD se compose de Jim Timourian (Alberta) à la présidence, et de George Bluman (UBC), Kathryn Hare (Waterloo), Tom Ransford (Laval) et Richard Wood (Dalhousie).

Le Conseil a également approuvé la création d'un nouveau Comité sur les étudiants. Bien que comité permanent de la SMC, celui-ci se trouve en position de quasi-indépendance. Issu du Congrès canadien des étudiants en mathématiques, il traduit le sentiment d'identité croissant qui habite les étudiants du Congrès. Ce comité a été intégré à la SMC à la demande des étudiants, pour nous permettre d'apporter un soutien accru. C'est notre Comité de nomination qui en choisira officiellement les membres, mais on prévoit que les étudiants joueront un rôle important au moment de la sélection.

Voilà que pour la première fois, la SMC a éliminé un comité! En effet, le Conseil a entériné la dissolution du Comité des affaires gouvernementales dont les principales responsabilités, au cours des dernières années, consistaient à effectuer le sondage annuel et à s'assurer de la présence de représentants aux réunions de nombreuses organisations situées dans la région d'Ottawa. Ces tâches seront redis-

tribuées à des personnes nommées par le Comité de direction.

La politique d'investissement de la SMC a donné lieu à une longue discussion. Nous possédons deux fonds de placement distincts : le Fonds de dotation et le Fonds pour les olympiades mathématiques dont les valeurs actuelles se situent respectivement à 1 500 000 \$ et à 200 000 \$. Depuis au moins deux ans, le Comité des finances a tranquillement énoncé une démarche à propos de ces investissements. Pendant les années 90, c'était notre Service de conseil en placement (regroupant à la fois des experts externes et des membres du Comité des finances de la SMC) qui prenait les décisions à ce propos. On croit maintenant, et particulièrement les membres du SCP, que nous devons passer de cette étape à une démarche plus professionnelle et énoncer plus précisément nos objectifs en la matière. À cette réunion de St. John's, le Conseil a approuvé plusieurs changements de politiques qui s'inscrivaient dans le cadre de cette discussion. Dorénavant, c'est le service de Gestion de placements TD qui veillera à nos fonds de placement. Ce changement se fera dans le cadre d'une " politique d'investissement passive " selon laquelle nos fonds propres seront placés en " fonds indexés " conçus pour suivre le rendement des principales références,

notamment les TSE 300 de Toronto et les 500 de Standard & Poor.

Permettez-moi de revenir sur le sujet du soutien aux étudiants. Comme le souligne le nouveau Comité sur les étudiants, il s'agit là d'une zone de croissance pour la SMC. Nous essayons présentement d'élaborer une infrastructure pour des activités d'étudiants à tous les niveaux et nous nous attendons à ce que plusieurs soient mises en oeuvre pendant l'année 1999-2000. Au niveau du secondaire, notre programme de renforcement, déjà bien nanti, s'enrichit tout spécialement de camps mathématiques (tant nationaux que régionaux). De plus, la première étape de la mise sur pied d'une association des anciens participants aux Olympiades mathématiques de la SMC au cours des vingt dernières années donnera lieu, en juin prochain, à la première réunion des anciens membres d'équipes de l'OMI. Au niveau universitaire de premier et de deuxième cycles, le premier " salon de l'emploi " se tiendra aux réunions de l'hiver 1999 et de l'été 2000. Nous nous pencherons cette année sur une nouvelle formule d'adhésion pour les étudiants; en effet, une proposition vise à offrir l'adhésion, en format électronique, à tous les étudiants de deuxième cycle. Cette adhésion virtuelle serait gratuite et représenterait un forum où les activités pertinentes seraient annoncées aux étudiants.

EDUCATION NOTES

Ed Barbeau, University of Toronto

An appeal

This column is here for several reasons. First of all, it is for news of what our members are doing in the sphere of mathematics education. Please let me know about any honours in education (teaching awards, for example) you or your colleagues have received. Send news of innovative courses and programs that your institute is offering; you can either write a short article

that will appear under your by-line or send me the material and I will prepare something. In particular, I would like to devote one of the columns this year to describing undergraduate courses directed to prospective elementary teachers and a second column to courses specifically for prospective secondary teachers.

Another purpose is to inform you about important conferences and publications. There are many educational

developments occurring in school systems across the country that should be reported here. Finally, this is a place where members of the Society can put forward opinions and engage in debate.

Communications can be sent to me at barbeau@math.utoronto.ca or Professor E.J. Barbeau, Department of Mathematics, University of Toronto, Toronto, ON M5S 3G3.

Canadian Performance in the Putnam Competition

As in earlier years, Canadian students performed well in the fifty-ninth William Lowell Putnam Mathematical Competition, written on December 5, 1998. Our heartiest congratulations go to team members **Sabin Cautis**, **Derek I.E. Kisman** and **Soroosh Yazdani**, of the **University of Waterloo**, for gaining a fifth place standing for their University. The University receives a cash award of \$5000, and each student an award of \$200. The **University of Toronto** team of **Cyrus Chen Hsia**, **Bhaskara M. Marthi** and **Ryan O'Donnell** got an honorable mention (ranking between sixth and tenth, inclusive).

There were a number of fine individual performances. An award of \$1000 goes to each of the following students ranking between sixth and fifteenth: **Sabin Cautis** and **Donny Cheung** of the University of Waterloo, and **Colin A. Percival** of Simon Fraser University. Among the next eleven highest ranking individuals, qualifying for awards of \$250 each, we find **Ian W. Caines** of Dalhousie University and **Adrian D. Corduneanu** of the University of Toronto.

The remaining students down to rank 58 receive honorable mention. Among these are **Shai M. Cohen** and **Cyrus Chen Hsia** of the University of Toronto, and **Derek I.E. Kisman** and **Ian Vanderburgh** of the University of Waterloo. Among the top approximately 200 students (with scores exceeding 42) are found 29 Canadian students from nine Canadian Universities.

Brock University program for formation of teachers

Over a decade ago, our colleagues at Brock University were venting their concern about the lack of teachers at the Junior and Intermediate level with a reasonable background in mathematics and science, or even with any real interest and enthusiasm. The situation

was not about to improve as it was rare for applicants to the education faculty to present such backgrounds. Their response was the creation of a concurrent BSc/BEd program, which first opened its doors to 30 students in 1990.

The program is administered by a director, a coordinator, an assistant coordinator and a council representing all participating departments from the Faculty of Mathematics and Science and from the Faculty of Education. Because teachers at the J/I level teach across the curriculum, the program is in Integrated Studies, which provides a broad base of university experience in mathematics, sciences and other disciplines. Students in the program select a specialization in mathematics or one of the sciences. In mathematics, this involves the traditional first year calculus and linear algebra courses followed by courses in statistics, combinatorics, discrete mathematics, geometry, history of mathematics, abstract algebra (concepts appropriate for teachers), and in issues involved in teaching of mathematics at the J/I level. The last mentioned two and a half courses were designed especially for the program.

In their second year, the students are in classrooms as observers, and get to try their hand with increasing intensity in the third and fourth years. Students with an admission average of at least 80% are admitted into the program on the basis of a letter indicating their commitment to teaching children, and must maintain an average of 75% to remain in the program. There is high retention and about three quarters of the students in second and third years make it to the dean's honour roll.

To provide a solid base of experience, Brock University runs camps in mathematics and science for about 1400 grades 6-8 students from all over Ontario during May and June. BSc/BEd students are paid instructors who develop modules in mathematics and science and teach them to the students. Some of these students are instructors also for a summer camp

for grade 7-8 students from the Six Nations and Quinte St.-Lawrence Reserves. Students are also placed as "tutors in the classroom" under a program sponsored by the Ontario Ministry of Education and Training, or act as judges and workshop leaders in the 1999 Niagara regional Science Fair.

This program, designed to produce a generation of mathematics students to take their places as leaders in elementary education is under the direction of Eric Muller, from whom further information can be obtained. He is in the Department of Mathematics, Brock University, St. Catharines, ON L2S 3A1 (phone: 905-688-5550 x3297; fax: 905-682-9020; email: emuller@spartan.ac.brocku.ca; url: <http://spartan.ac.brocku.ca/~emuller/>) The web site for the program is at <http://www.brocku.ca/bscbed/>

The CMS Meeting at St. John's: Extending the mathematical community

by *John Grant McLoughlin, Memorial University of Newfoundland*

Many of you will fondly recall the recent summer meeting in St. John's. Perhaps you are not as keenly aware of the incidental benefits it offered for education in the community. I will share some of the experiences with the dual purpose of raising awareness and encouraging future hosts to draw upon the richness of a local CMS meeting.

Formally, the meeting's agenda provided two windows of opportunity: Ed Barbeau's public lecture, and the Education Session. Bruce Shawyer and Ed Williams, co-organizers of the CMS Education Session, deserve credit for making arrangements to involve local high school teachers. Twenty to thirty teachers attended the session that focussed on the role of mathematics contests in mathematics education. Participation extended to the Sunday morning panel discussion of transition from high school to university mathematics.

The local media provided another avenue for public promotion of mathematics. Panelists Richard Nowakowski and Herb Gaskill were interviewed by CBC Radio on the transition issue. Ed Barbeau was also interviewed about mathematics. Further, a significant portion of the third page of *The Telegram* (published in St. John's) was devoted to a feature on Ed Barbeau concerning the public face of mathematics.

It is difficult to determine how many people were indirectly reached by the mathematical presence of the CMS in St. John's. In fact, two additional conferences were held in advance of the CMS meeting: the Canadian Undergraduate Mathematics Conference (in which MUN's undergraduates were involved and which opened with a talk by Kathy Heinrich) and a five-day Combinatorics Workshop organized by Nabil Shalaby. (I mentioned Kathy Heinrich's talk, because the presence of the CMS meeting made it practical. Such support of mathematical endeavours should be offered by CMS and its members.) Students' perceptions of mathematics and academics are also likely to be enhanced by observing faculty actively participating in such events.

The benefits of these sessions were extended over a few more days for a group of seven prospective secondary math teachers I was teaching during the intersession. Three of the invited speakers accepted invitations to meet the group. Ron Dunkley and Peter Crippin met with the class on Monday morning. They engaged the students in a curious blend of three components (at least): encouragement and advice for future teachers; information on the Canadian Mathematics Competition; and problem solving, of course! Jim Totten offered a morning of mathematical tricks and puzzles on Tuesday. The tricks offered insight into such things as binary numbers, parity, and dominance through the use of cards, elastic bands, and handkerchiefs. Students were also given an opportunity

to play with a range of wooden spatial puzzles (mostly handmade by Jim). Both Jim and the class itself welcomed several guests including a couple of Dalhousie graduate students who were invited at the public lecture, my own family and Peter Booth. In fact, Peter Booth extended the topological range of ideas with his own demonstration of elementary topological principles and "topological intuition" as a guest just two days later.

I would like to thank the prospective teachers in the Education 4163 course for their efforts to broaden their own mathematical perspectives through voluntary participation in aspects of the meeting and other events. Karen Baker, Sandy Blundon, Sherry Burry, Jennifer Gibbons, Daisy Hardy, Jon Mauger, and Paul Stewart have extended the utmost of respect to classroom guests and exhibited patience with me throughout a course that has intentionally challenged them to examine their own beliefs and perceptions of mathematics as they prepare to embark on their teaching careers.

As I write this in mid-June, the class is putting the final touches on a journal prepared by themselves. The journal features six sections, three of which are basically unedited and assigned by me and three more shaped and edited by the editorial boards made up of students. I am looking forward to the final versions. I will close with excerpts from three unedited pieces written for the "Course Events" section. The first two excerpts concern the presentation of Peter and Ron:

The two friends entertained the class in a near comedy-troupe fashion (and I say that with the greatest of respect) as they related their experiences, shared their insights, and ultimately became an inspiration to all of us. (Karen Baker)

They believe that students learn so much from these contests because it requires them to think. Students explore questions that are new and challenging . . . We experienced this first hand when

Peter presented the class with one of his favourite problems . . . I was really impressed with how Ron described mathematics and his view of the subject. He referred to mathematics as an "intellectual game" that improves and becomes more enjoyable when we bring passion to the game. (Sherry Burry)

The following comments pertain to Jim Totten who

. . . gave an extremely interesting talk on the connections between mathematics and magic. His talk was not a typical mathematics lecture, as one might expect. Rather, it was more of a performance. The people in our class participated as volunteers and the whole event was a lot of fun. Besides having fun, we also got the opportunity to learn some very interesting mathematics. (Jennifer Gibbons)

Mathematical Science projects at two science fairs:

Abbotsford and Vancouver

by Kathy Heinrich, Simon Fraser University

At their March and April '99 science fairs, respectively, Abbotsford and Vancouver included a section on projects in the mathematical sciences. This initiative was funded and supported by the Pacific Institute for the Mathematical Sciences (www.pims.math.ca), and by mathematicians, statisticians and computer scientists at UBC (University of British Columbia), UCFV (University College of the Fraser Valley) and SFU (Simon Fraser University), several school teachers and the Abbotsford and Vancouver science fairs.

The process: The initiators of the endeavour were Peter Borwein (pborwein@cs.sfu.ca) and Kathy Heinrich (heinrich@cs.sfu.ca), both members of PIMS, Patti Leigh (pleigh@scienceworld.bc.ca) of the Vancouver science fair and Pat Tracey (pat_tracey@sd34.abbotsford.bc.ca) of the Abbotsford science fair. Funding from PIMS (Pacific Institute for

the Mathematical Sciences) enabled us to hire a recent SFU mathematics graduate student (Nelly Simoes) to visit schools and work with teachers and students to encourage, assist and advise them in getting started on math projects. We were prepared to find a mentor at one of SFU, UBC or UCFV for any student looking for extra advice and input into their project and after the fair for those going on to the CWSF (Canada Wide Science Fair). The document *Math Projects for Science Fairs* (www.camel.math.ca/Education/mpsf/) and a shorter document on applied math problems in graph theory, were made available. PIMS also provided funding for awards for the students - including sponsoring a student to attend the CWSF should a project in the mathematical sciences be selected.

The outcome: There were seven projects designated mathematical science at the Abbotsford science fair and nine at the Vancouver science fair. Awards from \$25 to \$150 were made and one of the Vancouver students was selected to go to the CWSF. Both the CMS (Canadian Mathematical Society) and the SSC (Statistical Society of Canada) offer awards at the CWSF for projects featuring mathematical sciences.

Mathematicians, computer scientists and statisticians from SFU, UCFV and UBC participated in the judging and uniformly agreed that the overall quality of the projects was very good and some were quite outstanding. Most of the students were thinking like mathematicians and I quote from them: "I would go to church and just sit there trying to figure out the next step in our work." or "I just had this new idea this morning and now I am exploring what would happen if..." or "We looked at the numbers that were coming out and tried to find a relationship between them - and we think we found it."

It was exciting to talk with the students who were approaching their project with creativity, imagination and enthusiasm. Here's a few of the

projects to give you a taste of their work: a study of the odds in certain gambling games (blackjack, poker); the solution of two recursive problems (one of which was the "Tower of Hanoi"); a study of reflection, symmetry and mirrors; a study of numbers that are palindromes in two different bases (this was the project chosen to go to Edmonton and the CWSF); a study relating the arc of a basketball, its height and the distance of the player from the free-throw line; and a study of magic squares. In addition to looking at the math projects the judges also looked at all other science fair projects to identify those which had made significant use of mathematics or statistics and merited an award for their work. Special thanks are due to the teachers who encouraged the students to participate and supported them in their work. Several of the teachers chose to involve students from math classes not science classes, and in doing so opened doors to the fair for a group of students who would otherwise not have been involved.

The future: We will begin planning now for next year and the involvement of more students and teachers. We need early promotion of the possibility of entering math projects in science fairs and clarity as to the types of awards. The math projects document on the web is not particularly user friendly and work needs to be done to make it more accessible and useful to both students and teachers. Some thought needs to be given to a website featuring math projects (and acknowledging our major financial supporter - PIMS). We need to make sure mentors are available to support the students and that contact between them and students is encouraged. Few students took advantage of our offer of mentors. We need to make it better known that we are available to ask questions and provide additional sources of information. Conversations with someone close to the area often result in leading questions and more opportunities for exploration. And that's what it is all about

- exploration in the mathematical sciences.

Mathematics and Science at a St. John's School

The Department of Mathematics at Memorial University recently received a request to participate in a Math/Science Display at St. Paul's School in St. John's, NF. Ed Williams accepted the invitation and began to think about what would be best for a school of 400 pupils ranging up to Grade 9. He gives the following account:

"I decided to have several posters laminated including one of Pascal's Triangle which we have on display here in the Department. Also, I had another large poster on 'Say Goodbye to 82 jobs if you do not study math', along with posters on women in mathematics plus a host of handouts some of which were humorous. For example, one handout was a cartoon of a student standing in front of a Math Tips machine that delivered, for five cents, a card with a Math Tip on it. The caption above the student reading a card was 'Do your homework'. I told almost all of the students who visited my display that this was the most important handout of the twenty or so I had to offer.

"The display was in the school gym along with displays from about ten other groups including the Marine Sciences Centre, the Faculty of Medicine at MUN, the Hibernia Development Company, and a couple of local high tech firms. The students came one class at a time and spent a forty-minute period visiting the various displays. It was a great success. I also brought along one computer with some interesting software which interested the older students. Three senior undergraduate students assisted by running the display during the afternoon session.

"However, one of the most interesting outcomes resulted from interacting with the very curious grade ones and twos. Using the Pascal Poster, I

asked them if they ‘knew their numbers’. Then, using the poster, I would ask them to tell me the sum of $3 + 3$, or $6 + 4$, or $10 + 5$, and so on, while pointing to the poster but saying nothing. It was amazing how many of these very young children without prompting could see that my questions were related to what was on the poster and, in fact, several could in minutes an-

swer questions like the sum of 70 and 56. They quickly saw the pattern and wanted to stay to answer more questions, even when they had to leave.

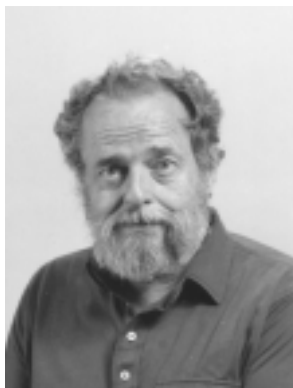
“It was one of the more satisfying experiences that I have had in this whole business of promoting mathematics outside the walls of this university. I received a very nice thank-you note from the school which read, *On be-*

half of the students and the staff at St. Paul’s, I would like to sincerely thank you for your time and efforts in making our science exhibition a great success. School and community relations continue to prosper because of the generosity of people like you. This was accompanied by a beautiful key chain engraved with the school crest.”

RESEARCH NOTES

Noriko Yui and James Lewis

The 32nd Jeffery-Williams Prize Lecturer



John Friedlander

The 32nd Jeffery-Williams Prize Lecture was presented in St. John’s at the summer meeting of the Society by Professor John Friedlander of the University of Toronto.

John Friedlander works in the area of analytic number theory and he is recognized as one of the world’s leaders in this field. He is mainly interested in prime numbers, their distribution in residue classes and their occurrence in various arithmetical sequences. The problems he has attacked included some of the oldest in mathematics. He has proved a host of beautiful results on L-functions, character sums, the Goldbach problem and the distribution of roots of a quadratic congruence modulo a prime. His papers with Granville on the irregularities of

the distribution of primes in arithmetical progressions have forced a rethinking of standard hypotheses.

Together with Iwaniec he has made a spectacular advance by proving that there are infinitely many primes of the form $x^2 + y^4$. This answers a long standing open problem and it represents a huge step forward for sieve theory since the counting function for the number of integers of the form $x^2 + y^4$ up to N grows like $N^{3/4}$. In particular, they have been able to prove the infinitude of primes in a naturally occurring sequence which is much thinner than anything that had been treated previously.

John Friedlander se spécialise dans le domaine de la théorie analytique des nombres et il est reconnu comme l’un des leaders du domaine à l’échelle mondiale. Il s’intéresse tout particulièrement aux nombres premiers, à leur distribution en classes de résidus et à leur occurrence dans diverses suites arithmétiques. Il s’est notamment attaqué à des problèmes parmi les plus anciens en mathématiques. Il a prouvé quantité de superbes résultats sur les fonctions L, sur les sommes de caractères, sur le problème de Goldbach et sur la distribution des racines d’une congruence quadratique modulo un nombre premier. Les articles qu’il a publiés avec Granville sur les irrégularités de la distribution des nombres premiers dans les progressions arith-

métiques ont forcé les mathématiciens à repenser les hypothèses considérées comme standard dans le domaine.

Avec Iwaniec, il a réalisé une avancée spectaculaire en prouvant qu’il existe une infinité de nombres premiers de la forme $x^2 + y^4$. Ce fut la réponse à un problème resté longtemps ouvert et un grand pas vers l’avant dans la théorie du crible étant donné que la fonction qui compte le nombre d’entiers de la forme $x^2 + y^4$ jusqu’à N croît comme $N^{3/4}$. Entre autres, ils ont réussi à prouver qu’il existe une infinité de nombres premiers apparaissant dans une suite naturelle qui est beaucoup plus fine que toutes les suites traitées précédemment.

The 5th Krieger-Nelson Prize Lecturer



Nicole Tomczak-Jaegermann

The 5th Krieger-Nelson Prize Lecture was presented in St. John's at the summer meeting of the Society by Professor Nicole Tomczak-Jaegermann of the University of Alberta.

Nicole Tomczak-Jaegermann of the University of Alberta is a world-leading expert in geometric Banach space theory. This is shown by her invitation to speak at the 1998 International Mathematical Congress, her inclusion in a group of five international experts chosen to lead a half-year program in Convex Geometry and Geometric Functional Analysis at the Mathematical Sciences Research Institute in Berkeley in 1996 and by the prominence of her work in the invited lecture by Fields' Medalist W. Timothy Gowers (Cambridge) at the International Mathematical Congress in 1994. That work tackled a problem which was more than 60 years old; but she has solved several other long-standing problems in her field, including a problem partially solved by Fields' Medalist Jean Bourgain. Below are some of the highlights of what she has accomplished.

When her work with her student R. Komorowski was combined a few months later with the work of Gowers, it produced a solution to one of the oldest and most unapproachable problems in Banach Space theory: The Homogeneous Banach Space Problem. An important finite-dimensional version of this problem was first partially solved by Bourgain, and then, a complete solution was obtained by Dr. Tomczak-Jaegermann with Mankiewicz; however, the infinite dimensional problem required totally different ideas and techniques.

In an outstanding paper with König in 1994, Dr. Tomczak-Jaegermann found the best upper bound of projection constants of importance in Banach space theory, convex geometry and approximation theory. That problem had defied the efforts of several modern and classical analysts for decades (only the two simplest special cases were found

in the early 1960s). In a series of papers with Mankiewicz, Dr. Tomczak-Jaegermann investigated the connections between fundamental geometric properties of bodies in R^n such as volumes and the linear structure of the underlying spaces. This was done by developing new difficult probabilistic techniques. One of the co-products (apart from finite-dimensional homogeneous Banach space problem) was a striking result characterizing a Hilbert space as the only space whose all sub-objects (subspaces and quotients) admit a classical coordinate system, a Schauder basis.

Dr. Tomczak-Jaegermann's work continues to be at the forefront of the structural properties of Banach spaces. She is one of the few who determine the direction of the field. Alone and with co-authors, Dr. Tomczak-Jaegermann developed the theory of asymptotic l_p spaces, described as "one of the hottest items being studied today" in Banach Spaces. Dr. Tomczak-Jaegermann's 1989 book is described as "already a classic" by experts in the field. She is a leader of her generation in Banach spaces and has a truly amazing number of fundamental results in the field. Recently, she has answered a much-worked-on problem about when spaces are arbitrarily "distortable"; to do this she rediscovered a combinatorial approach that bridges between finite- and infinite-dimensional phenomena.

Nicole Tomczak-Jaegermann, de l'Université de l'Alberta, est une sommité mondiale dans le domaine de la théorie géométrique des espaces de Banach. À ce titre, elle a été invitée à donner une conférence au Congrès international des mathématiciens de 1998 et à faire partie d'un groupe de cinq experts internationaux choisis pour diriger un programme de six mois sur la géométrie convexe et l'analyse fonctionnelle géométrique au Mathematical Sciences Research Institute de Berkeley, en 1996. Soulignons de plus la forte mesure de ses travaux dans le cadre de la conférence prononcée

par W. Timothy Gowers (Cambridge), lauréat de la médaille Fields, au Congrès international des mathématiciens de 1994. Ces travaux portaient sur un problème qui datait de plus de 60 ans, mais elle a également résolu plusieurs autres problèmes restés longtemps sans solution dans son domaine, notamment un problème partiellement résolu par un autre lauréat de la médaille Fields, Jean Bourgain. Voici quelques points saillants de l'ensemble de son oeuvre.

En combinant le travail réalisé avec son étudiant R. Komorowski avec les travaux de Gowers, quelques mois plus tard, elle est arrivée à résoudre l'un des problèmes les plus anciens et les plus difficiles à aborder de la théorie des espaces de Banach : le problème des espaces de Banach homogènes. Bourgain avait précédemment trouvé une solution partielle à une version importante en dimension finie de ce problème, auquel les professeurs Tomczak-Jaegermann et Mankiewicz ont trouvé une solution complète par la suite. Le problème en dimension infinie nécessitait toutefois des idées et des approches tout à fait différentes.

Dans un article sensationnel publié en collaboration avec le professeur König en 1994, le professeur Tomczak-Jaegermann a trouvé la meilleure borne supérieure des constantes de projection d'importance en théorie des espaces de Banach, en géométrie convexe et en théorie de l'approximation. Ce problème avait résisté aux efforts de plusieurs analystes modernes et classiques pendant des décennies (seuls les deux cas spéciaux les plus simples ont été résolus au début des années 1960). Dans une série d'articles publiés avec Mankiewicz, Nicole Tomczak-Jaegermann a étudié les rapports entre les propriétés géométriques fondamentales des ensembles de R^n , telles que le volume et la structure linéaire des espaces sous-jacents. Pour ce faire, elle a développé de nouvelles techniques difficiles du calcul des probabilités. L'un des corollaires de ces recherches (mis à part le problème des espaces de Ba-

nach homogènes en dimension finie) est un résultat étonnant qui caractérise l'espace de Hilbert comme le seul espace dont les sous-objets (sous-espaces et quotients) admettent un système de coordonnées classiques, ou une base de Schauder.

Les travaux du professeur Tomczak-Jaegermann demeurent à l'avant-plan de l'étude des propriétés structurelles des espaces de Banach. Elle est l'une des rares personnes qui fixent l'orientation du domaine. Seule ou avec des coauteurs, Nicole Tomczak-Jaegermann a développé la théorie des espaces l_p asymptotiques, considérée comme « l'un des sujets de recherches les plus en vogue de l'heure » dans les espaces de Banach. Son livre, publié en 1989, est déjà décrit comme un « classique » par les experts du domaine. Elle est un chef de file de sa génération, en ce qui concerne les espaces de Banach, et elle cumule un nombre impressionnant de résultats fondamentaux dans le domaine. Récemment, elle a résolu un problème qui a été beaucoup travaillé, soit de savoir quand un espace peut être 'distordu' de manière arbitraire; pour ce faire, elle a re-découvert une approche combinatoire qui fait le pont entre les phénomènes en dimension finie et ceux en dimension infinie.

Canada Gold Medal



James Arthur

Dr. Ronald Duhamel, Secretary of State (Science, Research and Develop-

ment) has announced that Dr. James Arthur of the University of Toronto is the 1999 winner of the Canada Gold Medal for Science and Engineering.

The award is made annually by NSERC (the Natural Sciences and Engineering Research Council of Canada). Dr. Arthur is the first mathematician to receive the award.

"Dr. Arthur has helped re-write the intellectual foundation of modern mathematics, and for more than two decades, he has worked tirelessly to develop a bright new generation of young Canadian mathematicians" said Dr. Duhamel.

"The Gold Medal is fitting recognition for his contributions to Canada, for his extraordinary career at the forefront of international research, and for his success in helping establish Toronto as a world class centre for mathematics."

The Canada Gold Medal honours outstanding, sustained, lifetime contributions to Canadian research. Individuals in all sectors concerned with the advancement of research - university, business, industry and government - may be nominated for the award. The final selection is made by an NSERC award committee on the basis of an international peer evaluation.

Citation

Dr. Arthur's developments in automorphic forms and representation theory - in particular, his innovative "trace formula" - have opened new approaches to the challenges posed by the "Langlands program" an ambitious and far-reaching theoretical mathematical model. Developed some 30 years ago by Canadian-born mathematician Robert Langlands, the model's ultimate goal is to link two great streams of classical mathematics: analysis, which deals with how phenomena such as planetary motion vary with respect to time; and algebra, which deals with the unchanging world of integers and prime numbers. The model has created a vision of a unified mathemati-

cal world in which mathematical disciplines previously believed independent will prove to be related in completely unexpected and astonishing ways.

But while the circumstantial evidence for a fundamental and absolute relationship between the two streams of mathematics is striking, the mathematical explanation remains elusive. Its pursuit has become a major field of mathematical endeavour around the world. When it is finally achieved, the knowledge that comes from the Langlands program will represent a fundamental ordering principle in mathematics and beyond. Some mathematicians believe that it will eventually explain phenomena not yet understood about the basic forces of nature.

Dr. Arthur's trace formula, developed in the early 1980s, has become mathematicians' most powerful tool in this pursuit. A deep and highly complex equation, one side of the trace formula deals with explicit geometric information, while the other side contains the more elusive spectral information that is at the heart of the Langlands program.

Dr. Arthur and others have been able to complete part of the Langlands program by using the geometric side of the trace formula to illuminate the spectral side. The formula is a far-reaching illustration of the basic duality between geometric and spectral objects that runs throughout all of mathematics and physics. It is analogous to the particle-wave duality of elementary particles in quantum mechanics. A more concrete analogy is the relationship between the shape of a musical instrument (its geometry) and the sound it produces (determined by the spectrum of its sound waves).

After completing the trace formula, Dr. Arthur went on to create what have come to be known as "Arthur packets." These packets enable mathematicians to deal with previously inexplicable anomalies in the energy levels (eigenvalues) that are part of the spectral information on the analytic side of

the trace formula. Dr. Arthur recognized that the anomalies have certain universal properties that allow them to be systematically analyzed. Arthur packets resolve the apparent inconsistencies and place all energy levels in the Langlands program on an equal footing.

Sloan Fellowship



Jingyi Chen

Jingyi Chen, assistant professor of Mathematics, University of British Columbia, has earned his department’s first Alfred P. Sloan Research Fellowship. He is one of only two Canadian university scientists to receive this prestigious award in 1999.

Competition for the \$35,000 US fellowships is fierce, involving nominations of most of the very best young scientists in North America who, according to the foundation, "show the most outstanding promise of making fundamental contributions to new knowledge."

"This is a tremendous honour for the department and UBC," says George Bluman, head of Mathematics. "We are most fortunate that Jingyi joined our department in 1997. Besides being a world class young researcher, he is also a fine teacher."

After completing a master’s degree at the University of Beijing in 1986, Chen earned his PhD at Stanford.

Chen will use the fellowship to continue his research in differential geometry and geometric analysis, particularly the structure of curved spaces.

"The quality and reputation of the Mathematics Dept. is what initially attracted me to UBC," says Chen. "Of course I was aware that the campus and Vancouver are beautiful places to live and work."

The Sloan Research Fellowships were established in 1955 to support and recognize young scientists, often in their first appointments to university faculties. Each year, 100 are awarded in six fields of science; only 20 are given in mathematics.

Since the program began, 21 Sloan fellows have become Nobel laureates.

André-Aisenstadt Prize



John Toth

The CRM has announced the awarding of the 1998 André-Aisenstadt Mathematics Prize to Professor John Toth of McGill University.

Professor Toth received his Ph.D. in 1993 at M.I.T. under the supervision of Victor Guillemin. He was a Benjamin Pierce Assistant professor at Harvard from 1993 to 1995, when he took up an appointment at McGill University in Montréal. Since his arrival at McGill he has been a mainstay of the analysis group, and has contributed actively to their graduate programme with several quite wonderful advanced graduate courses. He was an invited member of the Fields Institute for the fall of 1997 for their year on Microlocal Analysis.

Professor Toth’s work so far has centred on the theme of quantization

and the asymptotic behaviour of quantum systems, in particular quantum integrable systems, as one goes to the classical limit of $\hbar \rightarrow 0$. There has, of course been much work in this area, concentrating mostly on eigenvalue asymptotics and the corresponding approximate eigenfunctions (i.e. quasi-modes). One of the original features of his approach is that he obtains sharp asymptotic bounds for the actual eigenfunctions. This allows him, for example, to prove various examples of eigenfunction accumulation ("scarring"), for which there had previously been only computational evidence, as well as to show, in a precise, quantitative way, how the eigenfunctions and the corresponding classical dynamics interrelate.

Professor Toth is one of the leading young microlocal analysts in the world. His work combines a beautiful geometric insight into the nature of the eigenfunctions he is studying and detailed knowledge of the special functions involved in particular cases, both of these complementing a powerful analytic technique. His work builds on that of some of the leaders in our discipline, and improves it considerably in the particular cases, mostly integrable systems, which he considers.

John L. Synge Award



George Elliott

The Royal Society of Canada has announced that the John L. Synge Award will be presented to George Elliott at its meeting in November. The citation reads:

George A. Elliott, Department of Mathematics, University of Toronto and the Fields Institute, is a mathematician of international reputation. He is one of the leading experts in the field of operator algebras. He has obtained many substantial results, covering almost every aspect of the field. In particular, his remarkable work on derivations, approximately finite-dimensional algebras, C^* -K-theory, non-commutative tori, and Schrödinger operators has opened up new dimensions in recent research, and the classification program on which he is now embarked may well prove to have even greater significance yet.

The John L. Synge Award was established in 1986 by the Royal Society of Canada to honour John Lighton Synge, one of the first mathematicians working in Canada to obtain international recognition by research in mathematics. Professor Synge, FRS, FRSC, Member of the Royal Irish Academy, was for some years Head of the Department of Applied Mathematics at

the University of Toronto, later a senior professor at the Dublin Institute of Advanced Studies. He was the first recipient of the Henry Marshall Tory Medal of the Royal Society of Canada.

The Award is given for outstanding research in any of the branches of the mathematical sciences. Some preference is given to candidates whose age is not over 40 in the year of the award.

Ribenboim Prize

The Canadian Number Theory Association (CNTA) recently established an award, the Ribenboim Prize, for distinguished research in number theory.



Andrew Granville

The first prize was awarded at the 1999 CNTA meeting to Andrew

Granville of the University of Georgia. Prof. Granville was a Ph.D. student of Paulo Ribenboim from 1984 to 1987. Since his graduation from Queen's University he has published over 70 papers on a large variety of number theoretic subjects in such diverse areas as: diophantine equations, combinatorial number theory, analytic number theory, algebraic number theory, and computational number theory. His articles are without exception characterized by an imaginative approach and an obvious love of the subject matter. Furthermore, they are deep and fundamental contributions to number theory. He is perhaps best known for his work with Alford and Pomerance in showing that there exists an infinitude of Carmichael numbers. This problem had resisted resolution for over seventy years.

It is intended to award the prize every four years to a mathematician who is Canadian or has connections to Canadian mathematics, in conjunction with a CNTA meeting. The prize winner will receive a certificate and medal and will give a plenary talk at the associated CNTA meeting. Normally the prize winner will have received his or her Ph.D. within the last 12 years.

ICM2002

The next International Congress of Mathematicians, ICM2002, will be held at the Beijing International Convention Center, August 20-28, 2002.

The server of ICM2002 has been put into operation and an e-mail service has been set up. Those interested are invited to visit the website of ICM2002 at:

<http://icm2002.org.cn/>

and make a preliminary registration to keep informed. Alternatively, send e-mail to:

cms@math08.math.ac.cn

with the words PRELIMINARY REGISTRATION in the subject line.

Subscribers to the ICM'98 mailing list need not make a preliminary registration, as their data has already been forwarded to the ICM2002 organizers in Beijing.

CMS Winter 1999 Meeting Renaissance - Hôtel du Parc Montréal, Québec December 11 - 13, 1999

Second Announcement

On behalf of the Université de Montréal, the Département de Mathématiques et de Statistique extends a warm invitation to participate in the 1999 Winter Meeting of the Canadian Mathematical Society.

The meeting will follow an expanded format with a programme encompassing nine symposia, various meetings, and plenary talks including the Coxeter-James Lecture and the CMS Doctoral Prize. The symposia are in Algebraic and geometric methods in differential equations, Applied logic, Combinatorial algebra, group representations and Macdonald polynomials, Computing and mathematical modelling, General history of Mathematics, Mathematical genetics and genomics, Mathematical physics, Teaching of linear algebra, Orders, lattices and universal algebra. In addition there will be a Graduate Seminar and a Contributed Papers Session.

All scientific activities will take place from December 11 to 13, 1999 at the Conference Center of the Renaissance-Hôtel du Parc (3625, Avenue du Parc, Montreal (Quebec) Canada H2X 3P8, Tel (514) 288-6666 or (800) 363-0735, Fax (514) 288-2469, web page www.duparc.com).

The meeting will be preceded by the 30th anniversary of the CRM on December 10 at the Université de Montréal and followed by the First CMS "Job Fair" on December 14 at the Hôtel du Parc.

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/>

Public Lecture

Jennifer Chayes, Microsoft Research, Redmond, USA

Plenary Speakers

Andreas Dress (University of Bielefeld, Germany), *Virtual Crystallography and Tiling Theory*

Adriano Garsia (UCSD), *Update on the $n!$ conjecture*

David Lay (University of Maryland), *Recent advances in the teaching of linear algebra*

Elliott H. Lieb (Princeton), *Stability of matter: from Schroedinger's equation to quantum electrodynamics*

Pavel Pevzner (USC), *Transforming mice into men*

Zhihong Xia (Northwestern and Georgia Tech), *N body problem, central configurations....*

CMS Prizes

The **Coxeter-James Lecture** will be given by **Maciej Zworski**, University of California at Berkeley. He will speak on *The inverse problem for resonances*.

The **CMS Doctoral Prize** will be awarded to **Jian Shen**, Queen's University. He will speak on *On the Caccetta-Haggkvist conjecture and some related conjectures*.

Eric Muller (Brock University) will be the recipient of the 1999 **Adrien Pouliot Award**.

Symposia

By invitation of the Meeting Committee, there will be symposia in the following areas:

Algebraic and geometric methods in differential equations: the 20th century in celestial mechanics and one century of work on Hilbert's 16th problem (CMS-CRM)

(Org: **Angelo Mingarelli**, Carleton University and **Christiane Rousseau**, Université de Montréal)

Jacques Bélair (Montréal), Sue Campbell (Waterloo), Florin Diacu (Victoria), F. Dumortier (Diepenbeek, Belgium), Jean-Pierre Francoise (Université de Paris VI), John Guckenheimer (Cornell), Ana Guzmán (UNAM, Mexico), P. Holmes (Cornell), Yulij Il'yashenko (Moscow and Cornell), Angelo Mingarelli (Carleton), R. Moechel (Minnesota), Ernesto Perez (UAM, Mexico), Robert Roussarie (Dijon, France), Christiane Rousseau (Montréal), D. Saari (Northwestern), Dana Schlomiuk (Montréal), Sergey Yakovenko (Weizmann, Israël).

Applied Logic

(Org: **Wendy MacCaull**, St. Francis Xavier University, **Phil Scott**, University of Ottawa and **Prakash Panangaden**, McGill University)

Robin Cockett (Calgary), Josee Desharnais (McGill), Rick Blute (Ottawa), Esfan Haghverdi (Ottawa), Amy Felty (Bell Labs, Murray Hill, NJ), Franck van Breugel (York), Marta Bunge (McGill), Doug Howe (Bell Labs, Murray Hill, NJ), Alasdair Urquhart (Toronto), Francois Lamarche (INRIA), Gonzalo Reyes (Montréal), Joachim Lambek (McGill), Fahiem Bacchus (Waterloo), Robert Seely (John Abbott College).

Combinatorial algebra, group representations and Macdonald polynomials (CMS-CRM-LaCIM)

(Org: **François Bergeron**, UQAM **Nantel Bergeron**, York University and **Mike Zabrocki**, UQAM-CRM)

Ed Allen (WakeForest U.), Jean-Christophe Aval (Bordeaux), François Bergeron (UQAM), Nantel Bergeron (York), Carol Chang (Northeastern), Ivan Cherednik (North Carolina), Victor Ginzburg (Chicago), Mark Haiman (UCSD) (to be confirmed), Alain Lascoux (Marne la Vallee), Luc Lapointe (Montréal), Jennifer Morse (UCSD), Siddharta Sahi (Rutgers), Luc Vinet (Montréal), Mike Zabrocki (UQAM-CRM).

Computing and mathematical modelling
(CMS – NCM₂)

(Org: **Pierre Hansen**, Ecole des HEC, Montréal
and **Gilbert Laporte**, CRT, Université de Montréal)

Speakers to be announced.

General history of mathematics
(Org: **Richard O’Lander**
and **Ronald Sklar**, St-John’s University, USA)

Speakers to be announced.

Graduate Student Seminar (CMS-ISM)
(Org: **Paul Libbrecht**, UQAM,
and **Thomas Mattman**, McGill University)

A seminar is being organized by and for graduate students. Anyone interested in participating in this seminar should contact the Meeting Director at the following address: md-w99@cms.math.ca.

Mathematical physics (CMS-PIms)

(Org: **George Bluman**, UBC, **Michel Grundland**, UQTR
and **Gordon Slade**, UBC)

I. Probability methods and applications

Christian Borgs (Microsoft Research), Almut Burchard (Virginia), Neal Madras (York), Jeremy Quastel (Toronto), Mary Beth Ruskai (Massachusetts), Yvan Saint-Aubin (Montréal).

II. Group theory methods and applications

Stephen Anco (Concordia), Paul Bracken (Montréal and McGill), Edgardo Cheb-Terrab (Simon Fraser), John Harnad (Concordia), Nicky Kamran (McGill), A. Koudriavtsev (no affiliation), François Lalonde (UQAM), Martin Légaré (Alberta), Jiri Patera (Montréal), Greg Ried (Okanagan University College), Pavel Winternitz (Montréal).

Mathematical genetics and genomics
(CMS-Fields)

(Org: **Sabin Lessard**, Université de Montréal
and **David Sankoff**, Université de Montréal)

Kevin Atteson (Yale), Andreas Dress (Bielefeld), R.C. Griffiths (Oxford), Tao Jiang (McMaster), Ming Li (Waterloo), Nicholas Shork (CWRU), Katy Simonsen (Purdue), Simon Tavaré (USC), Elisabeth Thompson (Washington).

Orders, lattices and universal algebra
(Org: **Benoît Larose**, Collège régional Champlain,
Longueuil, **Lucien Haddad**, Royal Military College,
Kingston, and **Ivo Rosenberg**, Université de Montréal)

Speakers to be announced.

Teaching of linear algebra
(Org: **Joel Hillel**, Concordia University,
Véronique Hussin, Université de Montréal,
and **Jacqueline Klasa**, Vanier College and Dawson College,
Montréal)

Speakers to be announced.

In addition to this symposium, a *Forum on the Teaching of Linear Algebra* will take place on December 13 from 5:30 to 7:30 p.m. This related event is included in the registration fees for the Meeting. However, in order to encourage participation of CEGEP and high school teachers, a minimal onsite special registration fee will also be available to cover the associated costs, but it is hoped to find one or several sponsors to completely waive this fee.

Contributed Papers Session

Contributed papers of 15 minutes duration are invited and graduate students are particularly urged to participate. Abstracts for CMS contributed papers should be prepared as specified below. For an abstract to be eligible, the abstract must be received before **September 30, 1999**. The abstract must be accompanied by its contributor’s registration form and payment of the appropriate fees.

Related Activities

30th anniversary of the CRM: December 10, 1999, Centre de recherches mathématiques, Université de Montréal. For information, please contact Louis Pelletier (pelletl@CRM.UMontreal.CA)

First CMS “Job Fair”: December 14, 1999, Hôtel du Parc. For information, please contact Christiane Rousseau (rousseac@DMS.UMontreal.CA)

Submission of Abstracts

Titles for Plenary Speakers, Prize Lecturers and Invited symposia Speakers for the scientific and education programme will appear in the **November** issue of the *CMS Notes*. **Titles** for Contributed Papers will appear in the **November** issue of the *CMS Notes*. All **abstracts** will be published in the meeting programme and will also be available on the Canadian Mathematical Electronics Services (Camel) <http://camel.math.ca/CMS/Events/winter99>.

All speakers should send the title of their talk to their organizers before August 1st, and submit their abstract to the CMS as instructed by their organizers.

Plenary Speakers, Prize Lecturers and Invited symposia Speakers for the scientific and education programme:

Abstracts may be sent electronically, following instructions given below. Abstracts may also be prepared on the standard CMS form available from the session organizer or the CMS office in Ottawa. Abstracts should be sent to the Abstracts Coordinator, CMS Winter Meeting 1999, CMS Executive Office, 577 King Edward, Suite 109, Ottawa, Ontario CANADA K1N 6N5 by **September 1, 1999**.

Contributed Papers: Those submitting contributed papers may submit their abstracts electronically, following instructions given below, or by using the standard CMS form available from the CMS office in Ottawa, in the **September** issue of the *CMS Notes*, or at the CMS web site. Abstracts should be sent to the Abstracts Coordinator, CMS Winter Meeting 1999, CMS Executive Office, 577 King Edward, Suite 109, Ottawa, Ontario CANADA K1N 6N5 by **September 30, 1999**.

Electronic submission of abstracts: Files including the speaker's name, affiliation, complete address, title of talk, and abstracts may be sent to abstracts@cms.math.ca (speakers) or abstracts-cp@cms.math.ca (contributed papers).

Please note the above deadlines for the submission of your abstract.

Social Events

Welcoming Reception: The welcoming reception will be held during registration on Friday evening, December 10, from 7:00 p.m. to 9:00 p.m. at the Renaissance - Hôtel du Parc. A cash bar will be available.

Delegates' Luncheon: A delegate luncheon will be held on Saturday, December 11, from 11:30 a.m. to 2:00 p.m. at the Renaissance-Hôtel du Parc. The cost of this luncheon is included in all registration fees.

Banquet: The CMS banquet will be held on Sunday, December 12, starting at 7:00 p.m. at the Renaissance-Hôtel du Parc. A cash bar will be available at 6:30 p.m. Banquet tickets are available at \$45 each.

Vegetarian meals are available upon advance request. Please indicate preference on your meeting registration form. Ticket prices include wine, taxes and gratuities.

Coffee Breaks: Coffee and juice will be available during the scheduled breaks.

Exhibits

Exhibits: Exhibits will be open during specified hours in hall of the Conference Center. The CMS exhibit will be open throughout the course of the meeting.

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

CMS Membership Booth and Book Display: We invite delegates to visit the CMS Membership Booth and Book Display. A representative will be available from 9:00 a.m. to 5:00 p.m. every day to answer questions about membership, future meetings, publications, and other programs.

Information Table: In response to members' suggestions, this table will be set up in the registration area for information of interest to delegates. Please send a copy of your announcement to the Operations Manager, CMS, 577 King Edward, Suite 109, P.O. Box 450, Station A, Ottawa, Ontario, Canada K1N 6N5, facsimile (613) 565-1539.

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

Announcements may not be posted in the registration or meeting area. Personal distribution of announcements is also not allowed. Announcements of events competing in time or place with the meeting program cannot be accepted.

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

CMS Business Meetings

Executive Committee Meeting: The Executive Committee will meet on Thursday, December 9, from 9:00 a.m. to 4:00 p.m. in the Salon Jeanne-Mance of the Conference Center.

CMS Development Group Lunch: The CMS Development Group, consisting of the CMS Executive Committee and the

Chairs of all CMS Standing Committees, will meet on Friday, December 10, from 11:00 a.m. to 1:00 p.m. in the Salon Laurier of the Conference Center.

Board of Directors Meeting: The Board of Directors will meet on Friday, December 10, from 1:30 to 6:30 p.m. in the Salon Des Pins of the Renaissance-Hôtel du Parc. The Board is pleased to invite the Chairs of all CMS Standing Committees and the appointed delegates from the AMS and the MAA.

General Meeting: The General Meeting of the Society will take place on Sunday, December 12, from 3:30 p.m. to 5:30 p.m. at the Conference Center. All members are invited to attend.

Agendas and Meeting Material: Agendas and accompanying material for the General Meeting will be mailed three weeks before the meeting, that is **November 19**.

Notices of Motion: In accordance with CMS policy, notices of motion must be received at the Executive Office **at least eight weeks** before the meeting at which the notice of motion is to be considered.

Notices of motion must be duly signed by the mover and seconder, who must be members in good standing of the Society. In order to be considered at the General Meeting, such notices are to be sent to the Secretary, Canadian Mathematical Society, Executive Office, 577 King Edward, Suite 109, P.O. Box 450, Station A, Ottawa, Ontario, Canada K1N 6N5, facsimile: 613-565-1539, so as to arrive no later than 5:00 p.m., **October 15**.

Committee Meetings: Most standing and ad-hoc committees will hold meetings. CMS Members are encouraged to contact committee Chairs regarding any item for inclusion in committee agendas. Room assignments for all CMS committee meetings are in the hands of the Operations Manager in Ottawa.

Luncheon Meeting of the Department Heads: At the invitation of the Chair of the Département de Mathématiques et de Statistique of the Université de Montréal, a luncheon meeting of the department chairs will be held during the meeting. Further details will be provided when available and invitations will be sent directly to all department chairs.

Registration

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

Please note that **payment must be received on or before November 15 in order to qualify for reduced rates**.

A preregistration form will be included in the **September** issue of the *CMS Notes* and is available by contacting:

CMS Executive Office
577 King Edward, Suite 109
P.O. Box 450, Station A
Ottawa, Ontario CANADA K1N 6N5
Tel: 613-562-5702
FAX: 613-565-1539
Email: meetings@cms.math.ca

Electronic pre-registration is available on our Camel site at <http://camel.math.ca/CMS/Events/winter99>

	Before Nov 15	After Nov 15
All fees include a free meeting lunch ticket		
Plenary or Prize Speaker	\$ 0	\$ 0
Session speakers - or other category if less	200	200
Organizers	135	135
CMS/AMS/MAA members with grants	270	350
CMS/AMS/MAA members without grants	135	175
Non-members	400	520
One-day fee	135	175
Postdocs, retired	100	130
Students, unemployed	50	65
Banquet	45	45

Confirmation of Registration: Those delegates preregistering before **December 1** will receive a confirmation of registration and receipt in the mail. Those preregistering after **December 1** will find their receipt in their registration packet which may be picked up at the Registration Desk on-site.

Refund Policy: Delegates wishing to cancel their registration must notify the Executive Office **in writing before December 1** to receive a refund less a \$40 processing fee. Those whose contributed papers have not been accepted will upon request be fully refunded.

Tickets/Badges/Meeting program: All tickets, badges, and meeting programmes will be included in the registration packet which may be picked up at the Registration Desk at the meeting site.

On-site Registration: The Registration Desk will be open on Saturday, Sunday, and Monday from 8:00 a.m. to 5:00 p.m.

Accommodation

It is recommended that those attending the conference book early to avoid disappointment. Blocks of rooms have been reserved at three different facilities and will be held until **November 8, 1999**. Reservations not in by that date will be on a request only, space available basis. Rates quoted are in Canadian dollars.

Renaissance-Hôtel du Parc
3625, Avenue du Parc, Montréal (Québec) H2X 3P8
Check-in: 15:00; Check-out: 12:00
Reservation Deadline: **November 8, 1999**

Rates: \$109, single/double occupancy, *regular room*
 \$129, single/double occupancy, *Club excellence*
 (An additional charge of \$15/room for additional person.)

Applicable taxes: GST (7%), PST (7.5%),

Municipal hotel tax (\$2 per room)

Phone: 514-288-6666

Reservations FAX: 514-288-2469

Toll-free reservations (Canada & US): 1-800-363-0735

Reservations will be held until 18:00 on the arrival day only, unless you provide a deposit for one night or the reservation is guaranteed by a major credit card.

Quality Hotel

3440, Avenue du Parc, Montréal (Québec) H2X 2H5

Check-in: 15:00; Check-out: 12:00

Reservation Deadline: **November 8, 1999**

Rates: \$69, queensize bed or 2 double beds-s/d/t/q occupancy
 \$78, kingsize bed - single/double occupancy

Applicable taxes: GST (7%), PST (7.5%),

Municipal hotel tax (\$2 per room)

Phone: 514-849-1413

Reservations FAX: 514-849-6564

Toll-free reservations (Canada & US): 1-800-228-5151

Reservations will be held until 18:00 on the arrival day only, unless you provide a deposit for one night or the reservation is guaranteed by a major credit card.

Hôtel de Paris

901, rue Sherbrooke est, Montréal (Québec) H2L 1L3

This is a bed and breakfast style accommodation. Please call the number below for more details on accommodation and services provided.

Check-in: 12:00; Check-out: 12:00

Reservation Deadline: **November 8, 1999**

Rates: \$32, per person

Applicable taxes: GST (7%), PST (7.5%),

Municipal hotel tax (\$2 per room)

Phone: 514-522-6861 Reservations FAX: 514-522-1387

Toll-free reservations (Canada & US): 1-800-567-7217

Reservations will be held until 18:00 on the arrival day only, unless you provide a deposit for one night or the reservation is guaranteed by a major credit card.

Attendees should make their own reservations by calling the above numbers. The conference rate is extended up to two days pre- and post-convention. Please mention that you are participating in the CMS Winter Meeting.

Child Care

Child care can be arranged by the Renaissance-Hôtel du Parc by calling the front desk. Advance notice of 24 hours is required.

Travel

Autocar Connaisseur/Gray Line offers an Express Airport Service between Dorval and the Center-town Terminal (777,

de la Gauchetière) or the Voyageur Bus Terminal (Berri-UQAM subway station). Fees are \$9.25 one-way and \$16.75 return.

Gray Line provides transportation directly to l'Hôtel du Parc every half hour between 05:10 and 23:10. The cost is \$9.25 one-way. Please call ahead to organize transport.

To reach the Quality Hotel from the Voyageur terminal, take the subway (green line) to Place des Arts and then take the Bleury exit. Avenue du Parc extends Bleury Street to the North and the hotel is only a few blocks away.

To reach the Hôtel de Paris from the Voyageur terminal, walk up north on Berri and then turn right on Sherbrooke.

For more information, please consult the Dorval Airport website at www.admtl.com/dorval.

Acknowledgements

The support of the following organizations is gratefully acknowledged:

- Centre de recherches mathématiques
- Institut des sciences mathématiques
- Laboratoire de combinatoire et d'informatique mathématique
- Network for Computing and Mathematical Modeling
- The Fields Institute for Research in Mathematical Sciences
- The Pacific Institute for the Mathematical Sciences.

The CMS wishes to acknowledge the contribution of the members of the Meeting Committee for organizing this meeting and presenting these exciting scientific, educational, and social programs.

Meeting Committee

Meeting Director: Michel Delfour (Montréal)

Local Organizing Committee Chair: Véronique Hussin (Montréal).

François Bergeron, Nantel Bergeron, George Bluman, Monique Bouchard (CMS ex-officio), Martin Goldstein, Michel Grundland, Lucien Haddad, Pierre Hansen, Joel Hillel, Jacques Hurtubise (CMS ex-officio), Jacqueline Klasa, François Lalonde, Gilbert Laporte, Benoît Larose, Sabin Lessard, Paul Libbrecht, Wendy MacCaull, Thomas Mattman, Angelo Mingarelli, Richard O'Lander, Ivo Rosenberg, Christiane Rousseau, David Sankoff, Phil Scott, Ronald Sklar, Gordon Slade, Graham Wright (CMS ex-officio), Mike Zabrocki.

Items also published with this announcement

Registration Form

Abstract Form

Hotel Reservation Form

Réunion d'hiver de la SMC Renaissance Hôtel du Parc Montréal (Québec) du 11 au 13 décembre, 1999

Deuxième annonce

Au nom de l'Université de Montréal, le Département de Mathématiques et de Statistique est heureux d'accueillir à Montréal tous les participants et toutes les participantes à la Réunion d'hiver 1999 de la Société mathématique du Canada.

Suivant le nouvel esprit des réunions de la SMC, le programme a été considérablement enrichi pour inclure neuf symposia, plusieurs réunions, et neuf conférences plénières dont la conférence Coxeter-James et le prix de la meilleure thèse de doctorat. Les symposia portent sur le calcul et la modélisation mathématique, la combinatoire algébrique, les représentations des groupes et polynômes de Macdonald, l'enseignement de l'algèbre linéaire, la génétique et la génomique mathématiques, l'histoire générale des mathématiques, la logique appliquée, les méthodes algébriques et géométriques en équations différentielles, les ordres, treillis et algèbre universelle, et la physique mathématique.

Enfin il y aura le séminaire des étudiants aux cycles supérieurs et un espace pour des communications brèves.

Toutes les activités scientifiques se dérouleront du 11 au 13 décembre 1999 au Centre de Conférence du Renaissance Hôtel du Parc (3625, Avenue du Parc, Montréal (Québec) Canada H2X 3P8, Tél (514) 288-6666 ou (800) 363-0735, Télécopieur (514) 288-2469, page web www.du.parc.com).

La réunion sera précédée par le 30ème anniversaire du CRM le 11 décembre 1999 et suivie du premier Carrefour emploi de la SMC le 14 décembre 1999.

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/>

Conférence publique

Jennifer Chayes, Microsoft Research, Redmond, USA

Conférenciers pléniers

Andreas Dress (Université de Bielefeld, Germany), *Virtual Crystallography an Tiling Theory*

Adriano Garsia (UCSD), *Update on the $n!$ conjecture*

David Lay (University of Maryland), *Recent advances in the teaching of linear algebra*

Elliott H. Lieb (Princeton), *Stability of matter: from Schroedinger's equation to quantum electrodynamics*

Pavel Pevzner (USC), *Transforming mice into men*

Zhihong Xia (Northwestern et Georgia Tech), *N body problem, central configurations....*

Prix de la SMC

La conférence Coxeter-James sera donnée par **Maciej Zworski**, University of California at Berkeley. La conférence sera intitulée *The inverse problem for resonances*.

Prix de la meilleure thèse de doctorat sera présentée à **Jian Shen**, Queen's University. La conférence sera intitulée *On the Caccetta-Haggkvist conjecture and some related conjectures*.

Eric Muller (Brock University) recevra le **Prix Adrien-Pouliot** pour 1999.

Symposia

Sur l'invitation du comité de coordination, il y aura des symposia sur les thèmes suivants :

Méthodes algébriques et géométriques en équations différentielles : la mécanique céleste au 20è siècle et un siècle de travail sur le 16è problème de Hilbert (SMC-CRM)

(Org: **Angelo Mingarelli**, Université Carleton et **Christiane Rousseau**, Université de Montréal)

Jacques Bélair (Montréal), Sue Campbell (Waterloo), Florin Diacu (Victoria), F. Dumortier (Diepenbeek, Belgique), Jean-Pierre Francoise (Université de Paris VI), John Guchenheimer (Cornell), Ana Guzmán (UNAM, Mexico), P. Holmes (Cornell), Yulij Il'yashenko (Moscow et Cornell), Askold Khovanskii (Toronto), Angelo Mingarelli (Carleton), E. Perez (UAM, Mexico), Robert Roussarie (Dijon, France), Christiane Rousseau (Montréal), D. Saari (Northwestern), Dana Schlomiuk (Montréal), Sergey Yakovenko (Weizmann, Israël).

Logique appliquée

(Org: **Wendy MacCaull**, St. Francis Xavier University, **Phil Scott**, Université d'Ottawa et **Prakash Panangaden**, McGill University)

Robin Cockett (Calgary), Josee Desharnais (McGill), Rick Blute (Ottawa), Esfan Haghverdi (Ottawa), Amy Felty (Bell Labs, Murray Hill, NJ), Franck van Breugel (York), Marta Bunge (McGill), Doug Howe (Bell Labs, Murray Hill, NJ), Alasdair Urquhart (Toronto), Francois Lamarche (INRIA), Gonzalo Reyes (Montréal), Joachim Lambek (McGill), Fahiem Bacchus (Waterloo), Robert Seely (John Abbott College).

Combinatoire algébrique, représentations des groupes et polynômes de Macdonald (CRM-LaCIM-SMC)

(Org: **François Bergeron**, UQAM
Nantel Bergeron, York University
et **Mike Zabrocki**, UQAM-CRM)

Ed Allen (WakeForest U.), Jean-Christophe Aval (Bordeaux), François Bergeron (UQAM), Nantel Bergeron (York), Carol Chang (Northeastern), Ivan Cherednik (North Carolina), Victor Ginzburg (Chicago), Mark Haiman (UCSD) (a confirmer), Alain Lascoux (Marne la Vallée), Luc Lapointe (Montréal), Jennifer Morse (UCSD), Siddharta Sahi (Rutgers), Luc Vinet (Montréal), Mike Zabrocki (UQAM-CRM).

Calcul et modélisation mathématique (SMC – NCM₂)

(Org: **Pierre Hansen**, Ecole des HEC, Montréal
et **Gilbert Laporte**, CRT, Université de Montréal)

Liste de conférenciers à venir.

Histoire générale des mathématiques
(Org: **Richard O’Lander** et **Ronald Sklar**,
St-John’s University, USA)

Liste de conférenciers à venir.

Séminaire des étudiants aux cycles supérieurs (SMC-ISM)

(Org: **Paul Libbrecht**, UQAM,
et **Thomas Mattman**, Université McGill)

Ce séminaire est organisé par et à l’intention des étudiants aux cycles supérieurs. Toute personne intéressée à ce séminaire devrait contacter le Coordinateur de la Réunion, à l’adresse suivante : md-w99@cms.math.ca.

Physique mathématique (SMC-PIms)

(Org: **George Bluman**, UBC, **Michel Grundland**, UQTR
et **Gordon Slade**, UBC)

I. Méthodes probabilistes et applications

Christian Borgs (Microsoft Research), Almut Burchard (Virginia), Neal Madras (York), Jeremy Quastel (Toronto), Mary Beth Ruskai (Massachusetts), Yvan Saint-Aubin (Montréal).

II. Méthodes de la théorie des groupes et applications

Stephen Anco (Concordia), Paul Bracken (Montréal et McGill), Edgardo Cheb-Terrab (Simon Fraser), John Harnad (Concordia), Nicky Kamran (McGill), A. Koudriavtsev (no affiliation), François Lalonde (UQAM), Martin Légaré (Alberta), Jiri Patera (Montréal), Greg Ried (Okanagan University College), Pavel Winternitz (Montréal).

Génétique et génomique mathématiques (SMC-Fields)

(Org: **Sabin Lessard**, Université de Montréal
et **David Sankoff**, Université de Montréal)

Kevin Atteson (Yale), Andreas Dress (Bielefeld), R.C. Griffiths (Oxford), Tao Jiang (McMaster), Ming Li (Waterloo), Nicholas Shork (CWRU), Katy Simonsen (NCSSU), Simon Tavaré (USC), Elisabeth Thompson (Washington).

Ordres, treillis et algèbre universelle

(Org: **Benoît Larose**, Collège régional Champlain,
Longueuil, **Lucien Haddad**, Royal Military College,
Kingston, et **Ivo Rosenberg**, Université de Montréal)

Liste de conférenciers à venir.

L’enseignement de l’algèbre linéaire

(Org: **Joel Hillel**, Concordia University
Véronique Hussin, Université de Montréal,
et **Jacqueline Klasa**, Vanier College et Dawson College,
Montréal)

Liste de conférenciers à venir.

En plus de ce symposium, un *Forum sur l’enseignement de l’algèbre linéaire* se tiendra le 13 décembre de 17h30 à 19h30. Cet activité est incluse dans les frais d’inscription de la Réunion. Cependant, afin d’encourager la participation des professeur(e)s du collégial et du secondaire, un tarif minimal spécial pour couvrir les coûts associés leur sera consenti, mais on espère bien trouver un ou des commanditaires pour réduire ces frais à zéro.

Communications

Nous lançons un appel pour des communications en sollicitant particulièrement la participation des étudiants diplômés. Nous réservons 15 minutes pour chaque communication. Les résumés devront respecter les critères précisés ci-dessous et nous parvenir **au plus tard le 30 septembre 1999**. Nous demandons à chacun de joindre au résumé le formulaire et le règlement des frais d’inscription.

Activités connexes

30ème anniversaire du CRM: 10 décembre 1999, Centre de recherches mathématiques, Université de Montréal. Pour renseignements, s’adresser à Louis Pelletier (pelletl@CRM.UMontreal.CA)

Premier «Carrefour Emploi» de la SMC : 14 décembre 1999, Hôtel du Parc. Pour renseignements, s’adresser à Christiane Rousseau (rousseac@DMS.UMontreal.CA)

Envoi des résumés

Titres : La SMC publiera les **titres** des conférenciers pléniers, primés, et invités dans le numéro de **novembre** des *Notes et la SMC*. Les **titres** des communications paraîtront dans le numéro de **novembre**. Tous les **résumés** seront aussi accessibles à partir du site Web : <http://camel.math.ca/CMS/Events/winter99>.

Tous les conférenciers sont priés d'envoyer le titre de leur conférence aux organisateurs avant le 1er août et de faire parvenir le résumé de leur conférence à la SMC selon les instructions des organisateurs de leur symposium.

Conférenciers pléniers, primés et invités : Les résumés peuvent être transmis par courriel (instructions ci-dessous) ou par la poste sur le formulaire de la SMC disponible au bureau de la SMC ou par l'intermédiaire des organisateurs des symposia. Les résumés devraient parvenir à la Coordinatrice des résumés, Réunion d'hiver 1999, Bureau administratif de la SMC, 577 King Edward, Salle 109, Ottawa (Ontario) Canada K1N 6N5 **au plus tard le 1er septembre, 1999.**

Communications : les résumés peuvent être transmis par courriel (instructions ci-dessous) ou par la poste sur le formulaire de la SMC disponible au bureau de la SMC et dans le numéro de **septembre** des *Notes de la SMC*. Adresser le tout à la Coordinatrice des résumés, Réunion d'hiver 1999, Bureau administratif de la SMC, 577 King Edward, Salle 109, Ottawa (Ontario) Canada K1N 6N5 **au plus tard le 30 septembre, 1999.**

Envoi des résumés par courriel : On peut transmettre les fichiers, incluant le nom du conférencier, son affiliation, son adresse complète, le titre et résumé de la communication, à : resumes@smc.math.ca (conférenciers invités) ou resumes-cl@smc.math.ca (communications).

Prière de respecter les dates limites ci-dessus pour la soumission de votre résumé.

Activités sociales

Réception d'accueil : une réception d'accueil avec bar payant aura lieu le vendredi 10 décembre, de 19h00 à 21h00 pendant l'inscription au Renaissance Hôtel du Parc.

Lunch : le lunch des participants à la Réunion se tiendra le samedi 11 décembre, de 11 h 30 à 14 h 00, au Renaissance Hôtel du Parc. Ce repas est compris dans tous les frais d'inscriptions.

Banquet : le banquet de la conférence aura lieu le dimanche 12 décembre, au Renaissance Hôtel du Parc, à 19 h 00. Un bar-payant sera ouvert à 18 h 30. Le prix des billets pour le banquet est de 45 \$ l'unité et comprend le vin ainsi que les taxes et les pourboires.

Un menu végétarien est disponible à ceux qui en font la demande au préalable sur le formulaire d'inscription.

Pauses santé : café et jus seront offerts pendant les pauses.

Expositions

Exposants : les kiosques d'expositions seront ouverts aux heures indiqués dans le Hall du Centre de Conférence. Celui de la SMC restera ouvert durant toute la réunion.

Exposition conjointe : on y présentera des produits de maisons d'édition et d'autres sociétés et organismes non représentés à la Réunion. On trouvera des bons de commande sur place. La chef des opérations les transmettra aux sociétés concernées après la Réunion. Les livres et autres produits qui seront présentés à cette exposition seront offerts à l'université locale.

Comptoir d'adhésion et exposition de livres de la SMC : nous vous invitons à visiter le comptoir d'adhésion et l'exposition de livres de la SMC. Un représentant sera sur place de 9 h à 17 h tous les jours pour fournir des renseignements sur l'adhésion, les Réunions à venir, les publications et les autres activités de la Société.

Kiosque de renseignements : à la demande de nos membres, un kiosque de renseignements sera aménagé dans l'aire d'inscription. Veuillez envoyer une copie de votre annonce au chef des opérations, SMC, 577, avenue King Edward, bureau 109, C.P. 450, succ. A., Ottawa (Ontario), Canada K1N 6N5. Télécopieur : (613) 565-1539.

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

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

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

Séances de travail de la SMC

Réunion du comité exécutif : le comité exécutif se réunira le jeudi 9 décembre, de 9 h à 16 h au salon Jeanne-Mance du Centre de Conférence.

Lunch du groupe de développement : les membres du groupe de développement, formé du Comité exécutif et des présidences des comités permanents, se réuniront le vendredi 10 décembre, de 11 h à 13 h au salon Laurier du Centre de Conférence.

Réunion du Conseil d'administration : les membres du Conseil d'administration se réuniront le vendredi 10 décembre, de 13 h 30 à 18 h 30 au salon des Pins du

Renaissance-Hôtel du Parc. Le Conseil est heureux d'inviter à sa réunion les présidents des comités permanents de la SMC et les représentants nommés de l'AMS et de la MAA.

Assemblée générale : l'assemblée générale annuelle de la Société aura lieu le dimanche 12 décembre, de 15 h 30 à 17 h 30 au Centre de Conférence.

Ordres du jour et documentation : les ordres du jour et autres documents pour l'assemblée générale seront postés trois semaines avant la Réunion, soit le **19 novembre**.

Avis de motion : Conformément à la politique en vigueur, les avis de motion doivent être déposés au Bureau administratif de la Société **au moins huit semaines** avant l'assemblée à laquelle les motions seront étudiées.

Il doivent porter le nom et la signature de motionnaire et de l'appuyeur, qui doivent être membres en règle de la Société. Seuls les avis de motion reçus à l'adresse suivante avant 17 h le **15 octobre** seront retenus pour l'assemblée générale: Secrétaire de la SMC, Bureau administratif, 577, avenue King Edward, bureau 109, C.P. 450, succ. A., Ottawa (Ontario), Canada K1N 6N5.

Réunions des comités : la plupart des comités permanents et spéciaux organiseront une réunion. Les membres de la SMC désirant faire inscrire des points à l'ordre du jour sont priés de communiquer avec les présidents des comités. L'attribution des salles pour toutes les réunions des comités a été confié à la chef des opérations à Ottawa.

Lunch et réunion des chefs de département : à l'invitation du directeur du département des mathématiques et statistique de l'Université Montréal, une réunion des chefs de département aura lieu. De plus amples renseignements seront fournis dans un prochain numéro.

Inscription

Les frais (en devises canadiennes) sont payables par chèques, VISA ou MasterCard. Les paiements en devises américaines seront acceptés mais nous vous demandons de contacter votre institution financière pour prendre connaissance du tarif d'échange en vigueur.

Le paiement doit nous parvenir au plus tard le 15 novembre pour que vous ayez droit aux tarifs réduits.

Un formulaire de préinscription sera inclus dans le numéro de **septembre** des *Notes de la SMC*. On peut également se le procurer à l'adresse suivante :

Bureau d'administration de la SMC
577 King Edward, Suite 109
C.P. 450, Succursale A
Ottawa, Ontario CANADA K1N 6N5
Téléphone: 613-562-5702
Télécopieur: 613-565-1539
Courriel: reunions@smc.math.ca

Vous pouvez aussi vous inscrire par courrier électronique en consultant la page d'accueil de Camel : <http://camel.math.ca/CMS/Events/winter99>

Un billet pour le lunch des participants est inclus dans toutes les catégories	Avant 15 nov	Après 15 nov
Conférenciers principaux ou primés	\$ 0	\$ 0
Conférenciers (choisissez cette catégorie ou une autre moins élevé)	200	200
Organisateurs	135	135
Membres SMC/AMS/MAA avec subvention	270	350
Membres CMS/AMS/MAA sans subvention	135	175
Non-membres	400	520
Frais d'une journée	135	175
Postdocs, retraités	100	130
Étudiants, sans-emploi	50	65
Banquet	45	45

Confirmation d'inscription : ceux et celles qui s'inscriront avant le **1 décembre** recevront par la poste leur confirmation d'inscription et leur reçu. Ceux et celles qui s'inscriront après le **1 décembre** trouveront leur reçu dans la trousse d'inscription qu'ils pourront prendre au comptoir d'inscription sur les lieux de la Réunion.

Politique de remboursement : Les participants qui désirent annuler leur inscription doivent en aviser le bureau administratif de la SMC par écrit avant le **1 décembre** pour se voir rembourser leurs frais d'inscription (moins 40 \$). Les participants dont les communications n'auront pas été acceptées seront remboursés intégralement sur demande.

Billets, badges, programmes de la Réunion : vous trouverez les billets, badges et programmes pour la Réunion dans la trousse d'inscription que vous pourrez prendre sur place, au comptoir d'inscription.

Inscription sur les lieux : le comptoir d'inscription sera ouvert le samedi, dimanche et le lundi, de 8 h à 17 h.

Hébergement

Il est fortement recommandé aux participants de réserver à l'avance. Des chambres ont été retenues aux trois endroits ci-dessous jusqu'au **8 novembre, 1999**. Après cette date les hôtels ne prendront vos réservations que s'il reste des chambres disponibles. Les tarifs sont indiqués en devises canadiennes.

Renaissance Hôtel du Parc

3625, Avenue du Parc, Montréal (Québec) H2X 3P8

Arrivée : 15h; départ : 12h

Réserver au plus tard le **8 novembre, 1999**

Tarifs: 109,00 \$, 1 ou 2 personnes, *chambre régulière*

129,00 \$, 1 ou 2 personnes, *Club excellence*

(15,00 \$ supplémentaire par personne additionnelle)

Taxes applicables: TPS(7%), TVQ(7.5%),

taxe municipale de logement (2\$ par chambre)

Téléphone: 514-288-6666; Fax: 514-288-2469
 Réservations (Canada & US) sans frais: 1-800-363-0735
 Les chambres sont retenues jusqu'à 18h00 sauf si vous donnez un dépôt pour la première nuit ou un numéro de carte de crédit en garantie.

Quality Hôtel

3440, Avenue du Parc, Montréal (Québec) H2X 2H5

Arrivée: 15:00; départ: 12:00

Réserver au plus tard le **8 novembre 1999**

Tarifs: 69\$ chambre avec lit queen ou deux lits doubles pour 1,2,3 ou 4 personnes

78\$ Chambre avec lit king pour 1 ou 2 personnes

Taxes applicables: TPS(7%), TVQ(7.5%),

taxe municipale de logement (2\$ par chambre)

Téléphone: 514-849-1413; Fax: 514-849-6564

Réservations (Canada & US) sans frais: 1-800-268-6116

Les chambres sont retenues jusqu'à 18h00 sauf si vous donnez un dépôt pour la première nuit ou un numéro de carte de crédit en garantie.

Hôtel de Paris

901, rue Sherbrooke est, Montréal (Québec) H2L 1L3

Veillez appeler le numéro indiqué ci-dessous pour de plus amples renseignements sur les services.

Arrivée: 12:00; départ: 12:00

Réserver au plus tard le **8 novembre 1999**

Tarifs: 32\$ par personne

Taxes applicables: TPS(7%), TVQ(7.5%),

taxe municipale de logement (2\$ par chambre)

Téléphone: 514-522-6861; Fax: 514-522-1387

Réservations (Canada & US) sans frais: 1-800-567-7217

Les chambres sont retenues jusqu'à 18h00 sauf si vous donnez un dépôt pour la première nuit ou un numéro de carte de crédit en garantie.

Vous êtes priés de faire vos propres réservations. Les tarifs préférentiels s'appliquent aussi pour les deux jours qui précèdent et qui suivent la réunion. Veuillez mentionner que vous participez à la réunion d'hiver de la SMC.

Service de garde

Le Renaissance Hôtel du Parc peut organiser un service de garde moyennant un préavis de 24 heures.

Déplacements

Autocar Connaisseur/Gray Line offre le service Express Aéroport entre Dorval et l'aérogare Centre-Ville (777, de la Gauchetière) ou le terminus Voyageur (station de métro Berri-UQAM). Les tarifs sont de \$9.25 pour un trajet simple et de \$16.75 pour l'aller-retour.

Pour rejoindre directement l'hôtel du Parc, vous avez un service de la compagnie Gray Line à chaque demi-heure entre 5 h 10 et 23 h 10. Le coût du trajet simple est de \$9.25. Vous devez appeler l'hôtel pour organiser le transport.

Pour rejoindre le Quality hotel du terminus Voyageur, prenez le metro (ligne verte) jusqu'à la station Place des Arts et ensuite la sortie sur Bleury. L'avenue du Parc prolonge la rue Bleury vers le Nord et l'hôtel se trouve à quelques rues.

Pour rejoindre l'hôtel de Paris du terminus Voyageur, marchez vers le nord sur Berri et ensuite tournez à droite sur Sherbrooke.

Pour plus d'informations, vous pouvez consulter le site web de l'aéroport de Dorval à la section "services aux usagers" (www.admtl.com/dorval).

Remerciements

Nous remercions les organisations suivantes pour leur soutien financier

- Centre de recherches mathématiques
- Institut des sciences mathématiques
- Réseau de calcul et de modélisation mathématique
- Laboratoire de combinatoire et d'informatique mathématique
- The Fields Institute for Research in Mathematical Sciences
- The Pacific Institute for the Mathematical Sciences

La SMC tient à remercier tous les membres du comité de coordination pour l'organisation de la réunion et des activités scientifiques, éducationnelles et sociales.

Comité de Coordination

Président et coordonnateur : Michel Delfour (Montréal)

Présidente du Comité local : Véronique Hussin (Montréal).

François Bergeron, Nantel Bergeron, George Bluman, Monique Bouchard (SMC ex-officio), Martin Goldstein, Michel Grundland, Lucien Haddad, Pierre Hansen, Joel Hillel, Jacques Hurtubise (SMC ex-officio), Jacqueline Klasa, François Lalonde, Gilbert Laporte, Benoît Larose, Sabin Lessard, Paul Libbrecht, Wendy MacCaull, Thomas Mattman, Angelo Mingarelli, Richard O'Lander, Ivo Rosenberg, Christiane Rousseau, David Sankoff, Phil Scott, Ronald Sklar, Gordon Slade, Graham Wright (SMC ex-officio), Mike Zabrocki.

Documents publiés avec cette annonce

Formulaire d'inscription

Formulaire de résumé

Formulaire de réservation d'hôtels

Centre de recherches mathématiques
30^e anniversaire
30th anniversary

Le Centre de recherches mathématiques vous invite à célébrer son 30e anniversaire!

À l'occasion de son trentième anniversaire, le CRM organise, à l'Université de Montréal, un colloque d'une journée, le vendredi, 10 décembre 1999. L'événement précédera la Réunion d'hiver de la SMC qui aura également lieu à Montréal, du 11 au 13 décembre 1999. Six conférences d'une heure seront au programme:

The Centre de Recherches Mathématiques invites you to its 30th Birthday Party !

On Friday December 10th, 1999, a one-day conference will be held at the Université de Montréal to celebrate the CRM's thirtieth anniversary. The conference precedes the CMS Winter meeting, also held in Montreal (December 11th-13th, 1999) There will be six one-hour talks:

Nigel Higson, Penn State, "Asymptotic Geometry of Groups and Analysis in C^* Algebras"

Ioannis Karatsas, Columbia, "Probabilistic Aspects of Finance"

Dusa McDuff, SUNY-Stony Brook, "Symplectic Topology Today"

Bill Miller, IMA, TBA

Peter Sarnak, Princeton, TBA

Shing-Tung Yau, Harvard, TBA

Une réception en soirée clôturera cette journée. Afin d'avoir un juste aperçu du nombre de participants, nous vous prions de bien vouloir nous aviser de votre participation en communiquant avec Louis Pelletier (pelletl@CRM.UMontreal.CA).

The conference will be followed by a reception, with a buffet, in the evening. You are kindly requested to reply to Louis Pelletier (pelletl@CRM.UMontreal.CA) so that we can get an idea of the number of people attending.

Plus de d'information est disponible sur le site web du CRM (www.CRM.UMontreal.CA)

Full details are posted on the CRM web site (www.CRM.UMontreal.CA)

**REGISTRATION FORM - CMS WINTER 1999 MEETING
December 11-13, 1999 - Renaissance-Hôtel du Parc, Montreal, Québec**

Send completed form with payment to:

Canadian Mathematical Society, 577 King Edward, POB 450, Station A, Ottawa, Ontario, CANADA K1N 6N5
Phone: 613-562-5702, FAX 613-565-1539 (Please use the FAX # for credit card payments only.)

Important deadlines: Speakers, please send title of talk to organizers by August 1
Abstracts for plenary, prize, session speakers by September 1
Abstracts for contributed papers (with reg form) by September 30
Hotel Reservations by November 8
Preregistration for reduced rates payment by November 15
Cancellation (refund less \$40 penalty) by December 1

Name:	CMS ID # 00
Institution (for badge):	
Mailing Address:	Voluntary Information: <input type="checkbox"/> Male <input type="checkbox"/> Female
Telephone:	Email:
Arrival date:	Departure date:
PLEASE MAKE YOUR HOTEL RESERVATIONS DIRECTLY WITH THE HOTEL. Where will you be staying? <input type="checkbox"/> Renaissance/Hotel du Parc <input type="checkbox"/> Quality Hotel <input type="checkbox"/> Hôtel de Paris <input type="checkbox"/> Another hotel <input type="checkbox"/> N/A	
Special dietary needs: <input type="checkbox"/> Kosher <input type="checkbox"/> Vegetarian <input type="checkbox"/> Other - specify:	
I am: <input type="checkbox"/> a Plenary Speaker <input type="checkbox"/> a Prize Recipient <input type="checkbox"/> a Session Speaker <input type="checkbox"/> an Organizer	
<input type="checkbox"/> I would like to deliver a contributed paper.	
My abstract: <input type="checkbox"/> is enclosed <input type="checkbox"/> will follow <input type="checkbox"/> sent by e-mail	
I am a member of: <input type="checkbox"/> CMS <input type="checkbox"/> CAIMS <input type="checkbox"/> SSC <input type="checkbox"/> AMS <input type="checkbox"/> MAA	
(check all that apply) <input type="checkbox"/> University professor <input type="checkbox"/> Elementary teacher <input type="checkbox"/> High school teacher <input type="checkbox"/> College teacher <input type="checkbox"/> CEGEP teacher <input type="checkbox"/> Student <input type="checkbox"/> Postdoctoral fellow <input type="checkbox"/> Retired <input type="checkbox"/> Unemployed	
PLEASE INDICATE WHICH SESSION(S) YOU MIGHT BE ATTENDING	
<input type="checkbox"/> Algebraic/geometric methods <input type="checkbox"/> Applied Logic <input type="checkbox"/> Comb. Algebra <input type="checkbox"/> Computing/Modelling	
<input type="checkbox"/> History of Mathematics <input type="checkbox"/> Math Physics <input type="checkbox"/> Graduate Seminar <input type="checkbox"/> Genetics/Genomics	
<input type="checkbox"/> Orders/lattices <input type="checkbox"/> Teaching linear algebra <input type="checkbox"/> Contributed Papers	

Don't forget to purchase your ticket for the banquet !! All categories include a free ticket to the Meeting Lunch.		
Please circle one of the registration categories in the chart below	Before Nov 15	After Nov 15
Plenary Speaker / Prize Lecturer	\$ 0	\$ 0
Session Speakers (choose this or other category, whichever is less)	200	200
Organizers	135	135
CMS/AMS/MAA members with grants	\$270	\$350
CMS/AMS/MAA members without grants	135	175
Non-members	400	520
One-day fee	135	175
Postdocs, retired	100	130
Students, unemployed	50	65
Banquet (free for plenary/prize speakers)	45	45

CMS: \$	Banquet = \$	TOTAL \$
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Payment method: Cheque (payable to CMS) VISA Master Card Purchase Order (attached)

Credit Card #	Expiry:
If this is your credit card, please print your name as it appears on the card and sign your name. If this is not your card, please print holder's name as it appears on the credit card and have the card holder sign.	
Print:	Signature:

FORMULAIRE D'INSCRIPTION - RÉUNION D'HIVER DE LA SMC 1999
11-13 décembre - Renaissance-Hôtel du Parc, Montréal, Québec

Veillez envoyer ce formulaire et votre paiement à :

Société mathématique du Canada, 577 King Edward, CP 450, Succursale A, Ottawa, Ontario, CANADA K1N 6N5
 Téléphone: (613) 562-5702, Télécopieur: (613) 565-1539 (FAX pour paiements utilisant les cartes de crédit seulement.)

Dates importantes: s.v.p. envoyer le titre de votre conférence à l'organisateur avant le 1er août
 Résumé de conférences pour conférenciers invités 1 septembre
 Résumé de conférences pour communications 30 septembre
 Réservations d'hôtel 8 novembre
 Préinscription à prix réduit paiement avant le 15 novembre
 Annulation - Préinscription (remboursement moins 40\$) 1 décembre

Nom:	No. SMC 00
Institution (pour le "badge"):	
Adresse postale:	Information volontaire: <input type="checkbox"/> Homme <input type="checkbox"/> Femme
Téléphone:	Courier él:
Date d'arrivée:	Date de départ:
VOUS ÊTES PRIÉS DE FAIRE VOS PROPRES RÉSERVATIONS D'HÔTEL. Veuillez indiquer à quel hôtel	
<input type="checkbox"/> Renaissance Hôtel du Parc <input type="checkbox"/> Quality Hôtel <input type="checkbox"/> Hôtel de Paris <input type="checkbox"/> Un autre hôtel <input type="checkbox"/> N/A	
Diètes spéciales <input type="checkbox"/> Kasher <input type="checkbox"/> Vegetarien <input type="checkbox"/> Autre - préciser:	
<input type="checkbox"/> Je suis un organisateur Je suis un conférencier: <input type="checkbox"/> principal <input type="checkbox"/> honorifique <input type="checkbox"/> de session	
<input type="checkbox"/> Jaimerais présenter une communication.	
Mon résumé <input type="checkbox"/> est inclus <input type="checkbox"/> suivra <input type="checkbox"/> suivra par e-mail	
Je suis membre de: <input type="checkbox"/> la SMC <input type="checkbox"/> SCMIA <input type="checkbox"/> SSC <input type="checkbox"/> l'AMS <input type="checkbox"/> MAA	
cocher <input type="checkbox"/> Professeur d'université <input type="checkbox"/> Enseignant - élém. <input type="checkbox"/> Enseignant - secondaire <input type="checkbox"/> Enseignant - Collège <input type="checkbox"/> Enseignant - CEGEP <input type="checkbox"/> étudiant(e) <input type="checkbox"/> Postdoc <input type="checkbox"/> À la retraite <input type="checkbox"/> Chômeur	
VEUILLEZ INDIQUER À QUELLE(S) SESSION(S) VOUS PARTICIPEREZ	
<input type="checkbox"/> Méthodes algébriques/géométriques <input type="checkbox"/> Logique appliquée <input type="checkbox"/> Comb. algébrique <input type="checkbox"/> Calcul et modélisation <input type="checkbox"/> Histoire des mathématiques <input type="checkbox"/> Séminaire étudiant <input type="checkbox"/> Physique math. <input type="checkbox"/> Génétique/génomique <input type="checkbox"/> Ordres, treillis <input type="checkbox"/> L'enseignement <input type="checkbox"/> Communications	

N'oubliez pas d'acheter votre billet pour le banquet !!

Un billet pour le Lunch des délégués est inclus dans toutes les catégories d'inscription.

Veillez encercler la catégorie d'inscription choisie	Avant le 15 nov	Après le 15 nov
Conférenciers principaux / conférenciers primés	0 \$	0 \$
Conférenciers (choisissez cette catégorie ou une autre : le montant le moins élevé)	200	200
Organisateurs	135	135
Membres SMC/AMS/MAA avec subvention	270	350
Membres SMC/AMS/MAA sans subvention	135	175
Non-membres	400	520
Frais d'une journée	135	175
Postdocs, retraités	100	130
Étudiants, sans-emploi	50	65
Banquet (gratuit pour les conférenciers pléniers / primés)	45	45

CMS: \$	Banquet = \$	TOTAL \$
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Mode de paiement: <input type="checkbox"/> Chèque (au nom de la SMC) <input type="checkbox"/> VISA <input type="checkbox"/> Master Card <input type="checkbox"/> Bon de commande
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Carte de crédit #:	Date d'expiration:
Veillez inscrire votre nom (tel qu'il apparait sur votre carte) en lettres moulées et signer. Si vous utilisez une autre carte, veuillez inscrire le nom et faire signer le détenteur	
Lettres moulées:	Signature:

ABSTRACT FORM 1999 Canadian Mathematical Society Winter Meeting

Abstracts for Invited Speakers will be published in the meeting programme. CMS policy requires that all speakers complete and return this form to be received no later than **September 1, 1999**.

Abstracts for Contributed Papers will be published in the meeting programme. CMS policy requires that all contributed paper speakers complete and return this form to be received no later than **September 30, 1999**.

All abstracts will also be available on the Canadian Mathematical Electronic Services (Camel) at <http://camel.math.ca/CMS/Events/winter99/>

Mailing address:

CMS Winter Meeting 1999, Abstract Coordinator, CMS Executive Office,
577 King Edward, Suite 109, Ottawa, Ontario CANADA K1N 6N5

Electronic mail:

Please check one	Deadline	Email address
<input type="checkbox"/> Prize/plenary/invited speaker	September 1	abstracts@cms.math.ca
<input type="checkbox"/> Contributed Papers	September 30	abstracts-cp@cms.math.ca

Abstract forms for contributed papers must be accompanied by a registration form and the payment of the appropriate fees.

Your abstract may be submitted electronically using \TeX . Otherwise, please type your abstract in the box below using the equivalent of a 12 point font size. The heading containing the author's name, postal and e-mail addresses, and title of the talk is indented one half inch.

For convenience, the following information is provided in a sample format:

LASTNAME, FIRSTNAME, University name and postal address, email address

The title of the talk would go here

The author's name should be capitalized and the title of the paper should be in italics. Your cooperation in submitting your abstract according to the guidelines specified is essential to the organizers of the meeting.

Please type abstract below this line.

FORMULAIRE POUR LES RÉSUMÉS Société mathématique du Canada, Réunion d'hiver 1999

Les résumés des conférenciers invités seront publiés dans le programme de la réunion. La politique de la SMC exige que les conférenciers complètent et retournent ce formulaire pour qu'il parvienne à l'adresse ci-dessous avant le **1 septembre 1999**.

Les résumés de communications seront également publiés dans le Programme de la Réunion. La politique de la SMC exige que les conférenciers complètent et retournent ce formulaire pour qu'il parvienne à l'adresse ci-dessous avant le **30 septembre 1999**.

Tous les résumés seront disponibles sur le site de la SMC à l'adresse suivante

<http://camel.math.ca/CMS/Events/winter99/>.

Adresse :

Réunion d'hiver 1999, Coordinatrice des résumés, Bureau administratif
577 King Edward, Salle 109, Ottawa (Ontario) CANADA K1N 6N5

Adresse électronique :

Cocher une case	Date limite	Adresse électronique
<input type="checkbox"/> Conférenciers invités	1 septembre	resumes@smc.math.ca
<input type="checkbox"/> Communications	30 septembre	resumes-cl@smc.math.ca

Les formulaires pour résumés pour les communications doivent être accompagnés d'un formulaire d'inscription et du règlement des frais d'inscription qui s'appliquent.

Vous pouvez envoyer votre résumé par courrier électronique en format $\text{T}_{\text{E}}\text{X}$. Si cela n'est pas possible, veuillez dactylographier le résumé dans l'espace ci-dessous en utilisant l'équivalent d'un caractère de 12 points. L'en-tête contenant le nom de l'auteur, ses adresses postale et électronique et le titre de la conférence sont tapés en retrait d'un demi-pouce.

NOM DE L'AUTEUR, Nom de l'université, adresse de l'université, adresse électronique

Titre de la conférence

Le nom de l'auteur devrait apparaître en lettres majuscules et le titre de la conférence devrait apparaître en lettres italiques. Il est crucial pour les organisateurs que vous vous conformiez aux instructions fournies lors de la soumission des résumés.

Veuillez utiliser l'espace ci-dessous pour taper votre résumé.

Premier Carrefour emploi de la SMC

Organisatrice: Christiane Rousseau, Université de Montréal
rousseac@DMS.UMontreal.CA

Société mathématique du Canada, Réunion d'hiver, 1999
Hôtel du Parc - 14 décembre 1999

Le thème de la journée sera le suivant:

*La formation mathématique pour relever les défis de la
recherche et du développement*

Programme préliminaire

Le carrefour prendra la forme suivante :

- 9h: Ouverture de la journée
avec discours d'ouverture.
- 9h30-12h: Kiosques installés par les entreprises
(et les centres de transfert
et/ou réseaux de centres).
- 9h30-10h30: brèves présentations d'une demie-heure
(possiblement en parallèle) par les industries
de leurs travaux ou problématiques
de recherche
- 10h30-11h: Café
- 11h-12h: brèves présentations d'une demie-heure
(possiblement en parallèle) par des
universitaires de travaux de recherche
pouvant intéresser l'industrie
- 12h-14h: Buffet
- 14h: Panel *Un mathématicien dans l'industrie:
à quoi peut-il servir?*
Comment peut-il se faire valoir?
En avant de la salle se trouveront des panelistes
de l'industrie, des centres de transfert et des
universités: Bernard Goulard, CRM, Luc
Vinet et Langis Gagnon CRIM (non confirmé).

First CMS Job Fair

Organizer: Christiane Rousseau, Université de Montréal
rousseac@DMS.UMontreal.CA

Canadian Mathematical Society Winter Meeting 1999
Hôtel du Parc - December 14 1999

The theme of the day will be:

*Mathematical education for facing the challenges of
research and development*

Preliminary program

The schedule of the job fair is as follows:

- 9 am: Opening speeches.
- 9:30-12 noon: Displays by companies (and center
networks or centers of transfer).
- 9:30-10:30 am: Short presentations (30 minutes, possibly
in parallel sessions) by companies presenting
their research projects.
- 10:30-11 am: Coffee
- 11:00-12 noon: Short presentations (30 minutes, possibly in
parallel sessions) by university researchers
of research work linked with industrial problems.
- 12-2 pm: Lunch
- 2 pm: *Panel on mathematical studies for
employment in industry:* 4 panelists from
industry will be invited to present their
expectations. In front of the room will be
panelists from industry and from universities
among which Bernard Goulard, CRM, Luc Vinet,
and Langis Gagnon, CRIM (non confirmed).

Présentations par des industriels ou chercheurs industriels :

Presentations by industries or industrial researchers:

Jean-Paul Boillot, Servo-Robot Inc., *Les mathématiques au service de la vision des robots industriels*
Conférence en mathématiques financières, Pierre Bouvier, Caisse de dépôt et placement du Québec
Elisa Shabbazian, Lockheed Martin, *Mathematical solutions to the domain of decision support in large systems*

Présentations par des chercheurs universitaires :

Presentations by university researchers:

Michel Fortin, GIREF, Université Laval, *La collaboration mathématiciens-ingénieurs: y a-t-il une place pour les mathématiciens dans l'industrie?*
Pierre Hansen, HEC et GERAD, *Quelques applications industrielles de la recherche opérationnelle*
Jean-Marc Lina, CRM, Université de Montréal, *Quand l'imagerie devient aussi un sujet mathématique: de la compression à la détection*

31st Canadian Mathematical Olympiad

Daryl Tingley, Chair - Canadian Mathematical Olympiad Committee



CMO First Prize winner - (left to right): Mr. Chui; Mrs. Chui; Jimmy Chui (winner); Eric Campbell, Sun Life of Canada; and CMS President Richard Kane.

The CMS Awards Banquet was held at Renison College on the campus of the University of Waterloo, Monday, June 14. About 100 people attended the banquet including 67 students from the Canadian Mathematics Competitions Seminars. Most prize winners of the CMS sponsored competitions were among this group.

The highlight of the Awards Banquet was the awarding of prizes for the 31th (1999) Canadian Mathematical Olympiad (CMO) written on March 31 by 81 competitors from 48 Canadian schools. In addition, one student from Naparima Girls High School in Trinidad, who had received a high score on the Canadian Open Mathematical Challenge, was invited to participate as an unofficial contestant.

The prize winners of the CMO are as follows. First: Jimmy Chui (Earl Haig S.S., North York, ON) He received the Sun Life Cup. Second: Adrian Chan (Upper Canada College, Toronto, ON) Third: David Pritchard (Woburn Collegiate Institute, Scarborough, ON) Honourable mention: Edmond Choi (A.Y. Jackson S.S., ON), Masoud Kamgarpour (Carson Graham S.S., North Vancouver, BC), Jessica Yin Lei (Vincent Massey S.S., Windsor, ON), Pierre Le Van (Petit Séminaire de Québec, PQ), David Nicholson (Fenelon Falls S.S., Fenelon Falls, ON) and Yannick Solari, (Collège Édouard-Montpetit, Longueuil, PQ)

As well as prize money (donated by the CMO's sponsors, including the major sponsor Sun Life of Canada and the CMS) all of the prize winners received books and a year's subscription to *Crux Mathematicorum* with *Mathematical Mayhem*. Earl Campbell (Sun Life of Canada) presented the Sun Life Cup and cheques. Certificates and plaques were presented by Richard Kane (CMS President). Books were presented by Anthony Rezek (Nelson Thomson Learning) and Darren Lalonde (John Wiley & Sons Canada).

Reports on other Mathematics contests were presented during the Banquet. Ron Dunkley, chair of the Canadian Open Math Challenge Committee, reported on the 1998 Canadian Open Math Challenge. The top five students were (alphabetically) Daniel Brox (Sentinel S.S., West Vancouver, BC), Adrian Chan, Jimmy Chui, Pin Chang Liu (Sentinel S.S., West Vancouver, BC) and Ye Tao (Vanier College, Ville St. Laurent, PQ). Ed Barbeau (the Coordinator of the CMS Correspondence Training Program and this year's IMO Team Leader) reported on the performance of Canadians on the United States of America Mathematical Olympiad (Canadians are not eligible for prizes) and on the Asian Pacific Mathematic's Olympiad. The top three Canadian students (in order of their finish) on the APMO were Adrian Chan, David Arthur (Upper Canada College, Toronto, ON) and David Nicholson. On the USAMO the top three were David Pritchard, James Lee (Eric Hamber S.S., Vancouver, BC) and Jimmy Chui.

Canada's 1999 International Mathematical Olympiad team of David Arthur, Jimmy Chui, James Lee, Jessica Yin Lei, David Nicholson, and David Pritchard were introduced by Ed Barbeau.

Barbara Hejduc, President, Imperial Oil Charitable Foundation, and Christine Ericson, Marketing Communications Coordinator, Waterloo Maple, Inc., attended this year's Awards Banquet. Imperial Oil is the Title Sponsor for the ESSO Math Camps.

This year the IMO and CMO have received more press than ever before. There have been articles and pictures in the *Globe and Mail* and *Toronto Sun*, as well as other Toronto area newspapers, and interviews on the CFMT TV and CBC's radio program *This Morning*. There was also an on field presentation at a Blue Jays game to the Toronto area 1999 CMO prize winners and IMO team members. It is nice to see that mathematical talent is getting much more recognition by the media.

The continuing support by corporate and government sponsors and by the CMS membership is a great source of encouragement to all of us directly involved with the Society's competition activities. Of course, the greatest source of encouragement is seeing students perform at such an incredibly high level.

The CMO now moves from the University of New Brunswick at Fredericton to Simon Fraser University. Luis Goddyn is the new Chair of the CMO Committee. I am sure that, despite the hard work involved running the CMO, he too will find running this competition a very rewarding experience.

I would like to give my sincerest thanks to all those involved in making the the Society's competitions program such a success.

1999 ENDOWMENT GRANTS COMPETITION / CONCOURS DE BOURSES DU FONDS DE DOTATION 1999

CALL FOR PROPOSALS / APPEL DE PROPOSITIONS

The Canadian Mathematical Society is pleased to announce a new grants competition to fund projects that contribute to the broader good of the mathematical community. A portion of the annual income from the CMS Endowment Fund will be used to fund such projects and an Endowment Grants Committee (EGC) will administer the distribution of the grants and will adjudicate proposals for projects.

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

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

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

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

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

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

If it is anticipated that a proposal will generate something of lasting financial value, proposers must indicate that this is the case and declare their intent with respect to that value.

An application form, directions, and advice is available for downloading (in Acrobat PDF format) from the CMS website www.cms.math.ca/Grants by September. Proposers will have ample opportunity to sell their ideas to the EGC.

We hope to be able to have an applicant fill out the application on an HTML form and submit it electronically. If that does not work, we will accept a hard copy sent to the CMS Executive Office. If you have any immediate questions on the program or the application process please e-mail the Chair of the EGC, J. G. Timourian, at jgt@sassoun.com. If you plan on applying, the committee would find it extremely useful if you sent the Chair an e-mail expressing your interest as soon as possible.

Proposals must be received at the CMS Executive Office no later than **September 30, 1999**.

Proposals should be sent to the following address:
1999 CMS Endowment Grants Competition
Canadian Mathematical Society
577 King Edward, Suite 109
P.O. Box 450, Station A
Ottawa, Ontario
K1N 6N5

La Société mathématique du Canada (SMC) est heureuse d'annoncer la tenue d'un nouveau concours de bourses pour le financement d'activités qui contribuent à l'essor global de la communauté mathématique. Une partie des recettes annuelles tirées du Fonds de dotation de la SMC servira à financer de telles activités. Le Comité d'attribution des bourses du fonds de dotation (CABFD) se chargera d'évaluer les propositions et d'attribuer les bourses.

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

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

1. Regrouper et appuyer les mathématiciens canadiens en favorisant la communication et l'adhésion à grande

échelle, en commanditant diverses activités et en établissant des partenariats avec des associations professionnelles semblables à la nôtre.

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

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

Le CABFD évaluera les projets qui s'étalent sur un maximum de trois ans. Les projets s'échelonnant sur plusieurs années seront toutefois financés en fonction des fonds dont disposera le Comité l'année de la demande. De façon générale,

le Comité se limitera aux propositions dont le financement demandé n'excède pas 5 000 \$ par année.

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

Si les demandeurs prévoient tirer une valeur financière durable du projet, ils doivent l'indiquer et expliquer ce qu'ils ont l'intention d'en faire.

Il est possible de télécharger le formulaire de demande, les instructions pertinentes et des conseils (en format PDF d'Acrobat) du site de la SMC www.smc.math.ca/Grants en septembre. Ainsi, les proposants auront tout le temps voulu pour vendre leurs idées au CABFD.

Nous espérons qu'il sera possible de remplir la demande en format HTML et de la soumettre électroniquement. Sinon, nous accepterons les demandes imprimées qui seront envoyées au bureau d'administration de la SMC. Pour toute question sur le programme ou sur le procédé de demande, prière d'envoyer un courriel au président du CABFD, J.G Timouria, à l'adresse suivante : jgt@sassoun.com. Si vous prévoyez postuler, le comité vous saurait gré de lui faire part de votre intérêt le plus tôt possible par un courriel à son président.

Les propositions doivent parvenir au bureau administratif de la SMC au plus tard **le 30 septembre 1999**,

Envoyer les propositions à l'adresse suivante :
Concours de bourses du fonds de dotation 1999
Société mathématique du Canada
577, avenue King-Edward, bureau 109
C. P. 450, succursale A
Ottawa (Ontario) K1N 6N5

CALL FOR NOMINATIONS / APPEL DE CANDIDATURES

Editors-in-Chief - Canadian Mathematical Bulletin

Rédacteurs-en-chef - Bulletin canadien de mathématiques

The term of office of the present Editors-in-Chief of the Canadian Mathematical Bulletin will end December 31, 2000.

The Publications Committee of the CMS now invites nominations for the next Editors-in-Chief to serve a five year term.

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

- A curriculum vitae
- An expression of views of the publication indicating if any changes in direction or policy are contemplated
- Since editorial responsibilities often necessitate a lessening of responsibilities in an individual's normal

work, applicants should indicate that they have the support of their university department and, in particular of their head of department.

The Publications Committee will communicate its recommendation to the Executive Committee of the CMS in April 2000. Any input from the mathematical community concerning this important selection process is welcome.

Applications (with supporting material) and/or comments should be sent to the address below:

The deadline for the receipt of applications is **November 15, 1999**.

Le mandat des rédacteurs-en-chef actuels du Bulletin canadien de mathématique prendra fin le 31 décembre 2000.

Le Comité des publications de la SMC sollicite des mises en candidatures 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 directions ou de politiques sont envisagés
- Puisque les responsabilités de rédaction nécessitent souvent une réduction dans la charge normale de tra-

vail, les candidats devraient indiquer qu'ils(elles) ont l'appui de leur département et en particulier, de leur chef de département.

Le Comité des publications transmettra ses recommandations au Comité exécutif de la SMC en avril 2000. Les commentaires de la communauté mathématique au sujet de cette importante sélection sont bienvenus.

Les mises en candidatures (avec matériel à l'appui) et/ou commentaires devraient être acheminés à l'adresse qui suit:

L'échéance pour la réception des mises en candidature est le **15 novembre 1999**.

Editors-in-Chief - CMS Notes / Rédacteurs-en-chef - Notes de la SMC

The term of office of the present Editors-in-Chief of the *CMS Notes*, P.A. Fillmore and S. Swaminathan will end December 31, 2000.

The Publication Committee of the CMS 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 a curriculum vitae.

The Publication Committee will communicate its recommendation to the Executive Committee of the CMS in April 2000.

Applications and/or comments should be sent, by **November 15, 1999** to:

Le mandat du rédacteurs-en-chef actuels des *Notes de la SMC*, P. A. Fillmore et S. Swaminathan, prendra fin le 31 décembre 2000.

Le Comité des publications de la SMC sollicite les mises en candidature pour le prochain rédacteurs-en-chef pour un mandat de cinq ans..

Les mises en candidature doivent inclure une lettre formelle et un curriculum vitae.

Le Comité des publications transmettra ses recommandation au Comité exécutif de la SMC en avril 2000.

Les candidatures et/ou commentaires devraient être acheminés, avant le **15 Novembre 1999** à:

Address for Nominations / Adresse de mise en candidatures:

James A. Mingo
Chair / Président

CMS Publications Committee / Comité des publications de la SMC
Department of Mathematics and Statistics

Queen's University
Kingston, Ontario
K7L 3N6

CMS MEMBERSHIP ...

The 2000 Membership Notices will be mailed soon. Don't forget to renew your membership.

ADHÉSION À LA SMC ...

Les avis d'adhésion 2000 seront postés bientôt. N'oubliez pas de renouveler votre adhésion.

AMERICAN MATHEMATICAL SOCIETY

Conference Proceedings, Canadian Mathematical Society

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

Geometric Control and Non-holonomic Mechanics

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

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

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

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

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

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

Conference Proceedings, Canadian Mathematical Society.
Volume 25; 1998; 239 pages; Softcover; ISBN 0-8218-0795-1; List \$49; Individual member \$29; Order code CMSAMS/25CMS99

Algebras and Modules I

Idun Reiten, Sverre O. Smalø, Øyvind Solberg, Editors

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

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

Volume 23; 1998; 198 pages; Softcover; ISBN 0-8218-0850-8; List \$39; Individual member \$23; Order code CMSAMS/23CMS99

Algebras and Modules II

Idun Reiten, Sverre O. Smalø, Øyvind Solberg, Editors

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

Features:

- a unique source for the developments in the representation theory of finite dimensional and artin algebras and related topics
- a wide variety of important papers by leading researchers in the field, with references to earlier developments in the field

Volume 24; 1998; 569 pages; Softcover; ISBN 0-8218-1076-6; List \$99; Individual member \$59; Order code CMSAMS/24CMS99

Trends in Ring Theory

Vlastimil Dlab, László Márki, Editors

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

Volume 22; 1998; 239 pages; Softcover; ISBN 0-8218-0849-4; List \$49; Individual member \$29; Order code CMSAMS/22CMS99

Harmonic Analysis and Number Theory Papers in Honour of Carl S. Herz

S. W. Drury, McGill University, Montreal, PQ, and M. Ram Murty, Queen's University, Kingston, ON, Editors

This volume presents the proceedings of a conference held at McGill University (Montreal). The papers are dedicated to the memory of Carl Herz, who had deep interests in both harmonic analysis and number theory. These two disciplines have a symbiotic relationship that is reflected in the papers in this book.

Volume 21; 1997; 227 pages; Softcover; ISBN 0-8218-0794-3; List \$49; Individual member \$29; Order code CMSAMS/21CMS99

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NEWS FROM DEPARTMENTS

University of Calgary, AB:

Promotions: Rita Aggarwala to Associate Professor, and Claude Laflamme to Full Professor, both effective July 1, 1999.

McGill University, Mointreal, PQ

Appointment: Eyal Goren (number theory), Assistant

Professor from June 1999. (This corrects an error in the May issue.)

Simon Fraser University, Burnaby, BC:

Kathy Heinrich has accepted a five year term as Vice-President Academic at the University of Regina

Jon Borwein has been appointed to the IMU's Committee

36

on Electronic Information and Communication (CEIC).

University of Toronto, ON:

Steve Halperin has accepted a new position as Dean of the College of Computer, Mathematical & Physical Sciences at the University of Maryland, College Park. He has also

resigned his position as Program Director of MITACS.

Awards: Jim Arthur, Faculty Award. Lisa Jeffrey, Premier's Research Excellence Award. Boris Khesin, 1999 McLean Award. Pierre Milman, 1999 Killam Research Fellowship.

OBITUARY / AVIS DE DÉCÈS



**Norman J. Pullman
(1931 - 1999)**

The Department of Mathematics and Statistics at Queen's University in Kingston is deeply saddened to announce the death of Professor Emeritus Norman J. Pullman who passed

away on 28 May 1999 after a struggle with ALS. Norm Pullman was born in New York in 1931. After a brief career as a commercial artist, he obtained his M.A. in mathematics at Harvard and his Ph.D. at the University of Syracuse (1962) under the supervision of Peter Frank. He taught at McGill University from 1962 to 1965, and held a postdoctoral fellowship at the University of Alberta in 1965-66. He then moved to Queen's, where he taught until his retirement in 1994. Throughout his career, he made significant contributions to the study of powers of non-negative matrices, as well as to the theory of tournaments, graph decompositions, and linear preserver problems. He published over 80 papers in the areas of matrix theory and graph theory, as well as the book "Matrix

Theory and its Applications" (Dekker, 1976). While at Queen's, he supervised 15 graduate students, including 4 doctoral students. His personal and professional contributions were honoured in the festschrift "Graphs, Matrices, and Designs" (Dekker, 1993, R. Rees, Ed.), which marked the occasion of his 60th birthday.

An insightful researcher, a supportive and respected collaborator, a valued colleague and friend, Norm will be fondly remembered for his generosity, his sound counsel, and above all for his warm and lively sense of humour.

Source: David Gregory, Department of Mathematics & Statistics, Queen's University, Kingston, Ontario, Canada
Editorial note: A Memorial website may be found at <http://www.mast.queensu.ca/pullman/>

CARLETON UNIVERSITY – OTTAWA, ONTARIO SCHOOL OF MATHEMATICS AND STATISTICS

Due to recent retirements the School of Mathematics and Statistics is rebuilding its faculty complement and invites applications in all areas for several tenure-track positions at the level of Assistant Professor to begin July 1, 2000.

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Dr. Kenneth S. Williams, Director
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The deadline for applications is **November 15, 1999** or until all positions are filled.

In accordance with Canadian immigration requirements, this advertisement is directed to Canadian citizens and permanent residents. Carleton University is committed to equality of employment for women, aboriginal peoples, visible minorities, and persons with disabilities. Persons from these groups are encouraged to apply.

CALENDAR OF EVENTS / CALENDRIER DES ÉVÉNEMENTS

OCTOBER 1999

11–24 Workshops for Mathematics and its Applications (University of Minnesota, Minneapolis, MN)
http://www.ima.umn.edu/reactive/fall/msl.html

16–17 West Coast Operator Algebra Symposium (University of Victoria, Victoria, BC)
www.math.uvic.ca/wcoas

NOVEMBER 1999

Canadian Chairs' Meeting, CRM, Montreal
bluman@math.ubc.ca

14–18 International Conference on Mathematics Education into the 21st Century (Cairo, Egypt)
Dr. A Rogerson: arogers@mgs.vic.edu.au

29–Dec. 3 Group Theory and Computation (University of Sydney, Australia)
http://math.auckland.ac.nz/conference/groups-11-1999

DECEMBER 1999

2–5 The Future of Mathematical Communication, 1999, MSRI (Berkeley, California)
http://www.msri.org/activities/events/9900/fmc99/

11–13 CMS Winter Meeting / Réunion d'hiver de la SMC (Université de Montréal)
http://cms.math.ca/CMS/Events/

JANUARY 2000

19–22 Joint Mathematics Meetings, including the 106th Annual Meeting of the AMS (Washington DC), a WMY2000 event *www.ams.org/meetings/*

MARCH 2000

6–10 Fourth International Conference on Operations Research (Havana, Cuba) *lorch@mathstat.yorku.ca*

MAY 2000

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

JUNE 2000

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

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

OCTOBRE 1999

8–9 Symposium on the Legacy of John Charles Fields (Fields Institute, Toronto); a WMY2000 event
www.fields.utoronto.ca

10–13 MATH 2000 (McMaster University, Hamilton, Ontario)

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

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

JULY 2000

10–14 Third European Congress of Mathematics (Tokyo/Makuhari)
www.ma.kagu.sut.ac.jp/icme9/

11–25 41st International Mathematical Olympiad (Korea)

31–Aug 7 International Congression the Teaching of Mathematics ICME-9 (Barcelona, Spain)
3ecm@iec.es; http://www.si.upc.es/3ecm/

AUGUST 2000

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

SEPTEMBER 2000

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

DECEMBER 2000

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

JUNE 2001

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

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

NOVEMBRE 1999**JUILLET 2000****AOÛT 2000****SEPTEMBRE 2000****DÉCEMBRE 2000****JUIN 2001**

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

DECEMBER 2002

DECEMBRE 2002

DECEMBER 2001

DECEMBRE 2001

CMS Winter Meeting / Réunion d'hiver de la SMC
(York University, Toronto, Ontario)

Monique Bouchard: meetings@cms.math.ca

CMS Winter Meeting / Réunion d'hiver de la SMC
(University of Ottawa / Université d'Ottawa,
Ottawa, Ontario)

Monique Bouchard: meetings@cms.math.ca

JUNE 2002

JUIN 2002

CMS Summer Meeting / Réunion d'été de la SMC
(Université Laval, Québec, Québec)

Monique Bouchard: meetings@cms.math.ca

JUNE 2003

JUIN 2003

CMS Summer Meeting / Réunion d'été de la SMC
(University of Alberta, Edmonton, Alberta)

Monique Bouchard: meetings@cms.math.ca

AUGUST 2002

AOÛT 2002

20–28 International Congress of Mathematicians,
(Beijing, China)

cms@math08.math.ac.cn; http://icm2002.org.cn/

DECEMBER 2003

DECEMBRE 2003

CMS Winter Meeting / Réunion d'hiver de la SMC
(Simon Fraser University, Burnaby, British Columbia)

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March/mars	January 15 janvier
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