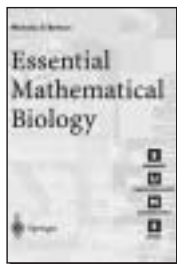


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**DU BUREAU DE
LA PRÉSIDENTE***Dr. Christiane Rousseau*

Eh oui, nous voilà déjà au début d'une nouvelle année scolaire. Avant d'aborder les projets de l'année qui s'amorce, j'aimerais vous dire quelques mots de la fin de l'année 2002-2003, car nous avons eu droit à deux activités d'envergure, le Forum canadien sur l'enseignement des mathématiques, tenu à l'UQAM du 16 au 18 mai, et la Réunion d'été de la SMC, tenue à l'Université de l'Alberta du 14 au 16 juin.

Accueillant près de 400 participants, la Réunion d'été de la SMC a connu un franc. Ce fut une autre merveilleuse occasion de retrouver les vieux amis de la communauté mathématique et de faire de nouvelles rencontres, de souligner nos réussites et de profiter de la ville hôte, notamment des parcs longeant la rivière North Saskatchewan et les trésors du musée provincial, où s'est déroulé le banquet.

Conformément à la formule habituelle, la Réunion a présenté treize symposiums très diversifiés, une conférence populaire et deux conférences de nos lauréats de prix. Ram Murty (Queen's) a prononcé la conférence Jeffery-Williams – lui qui avait remporté le prix Coxeter-James en 1988 – et Leah Keshet (UBC) a donné la conférence Krieger-Nelson. Nos cinq éminents conférenciers principaux étaient Ingrid Daubechies (Princeton), Roland Glowinski (Houston), Gerhard Huisken (Tuebingen/Institut Albert Einstein), James Lepowsky (Rutgers) et Dennis Shasha (Institut Courant). La conférence populaire, intitulée « An evening excursion to the zoo » mettait en vedette Robert Moody (Alberta). Au nom de tous les participants, je tiens à remercier les organisateurs et commanditaires de cette Réunion de leur appui et de leur excellent travail.

Pour la première fois, la Réunion d'été de la SMC a été précédée de l'atelier « Connecting women in Mathematics across Canada », destiné aux étudiantes des cycles supérieurs inscrites dans une université canadienne et organisé conjointement par le Comité des femmes en mathématiques de la SMC et l'Institut du Pacifique pour les sciences mathématiques (PIMS). Et pour la seconde année consécutive, la Réunion a été précédée d'un atelier conçu particulièrement pour les nouveaux professeurs de mathématiques et de statistique. Cet atelier, qui

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EDITORIAL



Robert J. MacG. Dawson

Passing the Notes Around

In recent years there has been a great deal of debate about the balance, in an electronic age, between “protection of intellectual property” and “free information”. On the one hand, we have some corporations, and some artists, demanding ever-stricter regulation of copying; recent legislation south of the border has increased copyright protection for many works by another 25 years. On the other hand, we have increasing numbers of people — especially within certain age groups — arguing that the concept of copyright is simply obsolete and that “ripping”, “burning”, and file-sharing are the way of the future.

The attitudes of both sides are easy to ridicule. One can be forgiven for wondering whether the principles at stake in extending copyright protection still further involve the struggling artist or the immortal (and ultimately uncreative) corporation. On the other hand, it's also difficult to see any principle but greed behind the “it's what young people do, get used to it” approach to music piracy.

There have been some more creative approaches. Canadian law, for instance, permits copying recorded music for private use, while charging a tax on recording media used to compensate recording artists. It's not a perfect solution, and neither consumers nor musicians are completely

happy with it, but that tends to happen with a genuine compromise. Again, there have been encouraging attempts to work out alternative models of intellectual property, such as the Free Software Foundation's “Copyleft”, a model for retaining intellectual rights while permitting free use by others.

So what does this have to do with us as mathematicians? Of course, a great deal of mathematics is involved in the software used, both in the data compression that makes file sharing feasible and the security software used to fight it. Ironically, number theory — in whose uselessness Hardy claimed such pride — is one of the more important branches of mathematics here!

Most mathematicians, however, are more involved as creators and users of knowledge. We write papers, which we send off to journals. The journals, if they choose to publish them, rarely pay us. Indeed, we may end up paying page charges; and offprints, beyond perhaps the first fifty, cost an amount per page rivaled only by the most obscure or artistically-bound hardback publications.

Again, there are good arguments on both sides. It's difficult to see why, when we have two journals of comparable quality, one should cost five times as much as another — especially when it's common knowledge that, whomever this money goes to, the authors and referees are as unpaid as at the cheaper journal. On the other hand, journals do cost money to run, and it is not unreasonable that a journal — like the Society's own *Journal and Bulletin* — should return some profit to the organization or company that runs it.

However, there is no doubt that high subscription rates do discourage readers. Expensive journals get dropped by libraries, and readers at smaller institutions will undoubtedly have first-hand experience of this. Even the \$50 subscription price of a journal as

inexpensive as the CMS Notes may put it beyond the reach of a school library.

But again there are solutions. There are wholly electronic journals, such as the *Journal of Statistical Education* and *Theory and Applications of Categories*, which exist only in electronic form and are free to anybody who wishes to download and read them.

And it is our pleasure to remind readers that the electronic version of the *Notes* is also available to everybody, at no cost.

Put the URL <http://journals.cms.math.ca/Notes/> onto your website. Tell your students. Tell your local teachers — or anybody else who might be interested. Pass the *Notes* around!

CANADA WINS TWO GOLD AND THREE BRONZE MEDALS AT THE 44TH INTERNATIONAL MATHEMATICAL OLYMPIAD IN TOKYO, JAPAN

The six members of the 2003 Canadian IMO team were: Robert Barrington Leigh, Old Scona Academic High School, Edmonton, Alberta; Olena Bormashenko, Don Mills Collegiate Institute, Toronto, Ontario; Tianyi (David) Han, Woburn Collegiate Institute, Toronto, Ontario; Oleg Ivrii, Don Mills Collegiate Institute, Toronto, Ontario; János Kramár, University of Toronto Schools, Toronto, Ontario; and Jacob Tsimmerman, University of Toronto Schools, Toronto, Ontario.

At the Awards Ceremony on July 18th, 2003 in Tokyo, Gold Medals were awarded to Olena Bormashenko and Jacob Tsimmerman; Robert Barrington Leigh, Tianyi (David) Han and Oleg Ivrii were awarded Bronze Medals.

The team was accompanied by the Team Leader, Dr. Andy Liu (University of Alberta), the Deputy Team Leader, Mr. Richard Hoshino (Dalhousie University), and the Observer, Mr. Robert Morewood (Burnaby South Secondary School).

“Our young team performed extremely well. Canada finished in the top 13 (out of 82 countries) and won five medals,” said Dr. Liu. “I am immensely proud of their outstanding performance”.

A report on the 44th IMO will be published in a future issue of the *Notes*.

LE CANADA REMPORTE DEUX MÉDAILLES D'OR ET TROIS DE BRONZE À LA 44^{IÈME} OLYMPIADE INTERNATIONALE DE MATHÉMATIQUES À TOKYO, AU JAPON

Les six membres de l'équipe canadienne 2003 sont : Robert Barrington Leigh, Old Scona Academic High School, Edmonton (Alberta); Olena Bormashenko, Don Mills Collegiate Institute, Toronto (Ontario); Tianyi (David) Han, Woburn Collegiate Institute, Toronto (Ontario); Oleg Ivrii, Don Mills Collegiate Institute, Toronto (Ontario); János Kramár, University of Toronto Schools, Toronto (Ontario); Jacob Tsimmerman, University of Toronto Schools, Toronto (Ontario).

À la cérémonie de remise des médailles du 18 juillet 2003, à Tokyo, des médailles d'or ont été décernées à Olena Bormashenko et à Jacob Tsimmerman; Robert Barrington Leigh, Tianyi (David) Han et Oleg Ivrii ont pour leur part reçu des médailles de bronze. Olena Bormashenko est la première élève féminine à remporter une médaille d'or pour le Canada, et Jacob Tsimmerman est le plus jeune canadien à décrocher l'or à ce jour.

Le Canada avait pour chef d'équipe et chef d'équipe adjoint MM. Andy Liu (Université de l'Alberta) et Richard Hoshino (Université Dalhousie) respectivement. L'équipe était aussi accompagnée d'un observateur, M. Robert Morewood (Burnaby South Secondary School).

« Notre jeune équipe a obtenu des résultats exceptionnels. Le Canada a fini dans les 13 premiers (de 82 pays) et a remporté cinq médailles », dit M. Liu. « Je suis extrêmement fier de nos concurrents ».

Un rapport de la 44^{ième} OIM sera publié dans une prochaine édition des *Notes*.

REMEMBERING DONALD COXETER

By Arthur Sherk

I first met Donald Coxeter in the Spring of 1955. At the time, I was a Master's student at McMaster University, writing a thesis under the direction of Norman Lane. Norman knew that I was interested in continuing graduate studies in Geometry, and therefore took me to Toronto so that we could talk with Coxeter about the possibility of my pursuing the PhD under his direction.

In spite of the fact that he was busy with a visiting mathematician at the time, Donald took the time to talk to us, and readily consented to taking me on. A few days after the interview, I received a letter from him, confirming his agreement, and suggesting ten different topics that I might like to consider for my thesis. Although I was pleasantly surprised at receiving such a prompt and detailed reply, I learned later that prompt action was a Coxeter characteristic. This trait (which no doubt has contributed greatly to the great size of his published work) became very evident to me a few months later when I came to him one day with the topic that I had selected from his list. He said: "That's fine; we'll have you talk about it in the Colloquium next winter.!" Two or three times a week, Professor Coxeter (as, of course, I addressed him then) would drop by my office to see how progress was coming along. If I had something to report to him, he was delighted. If there was nothing I could report, he looked a little sad and departed; that was a bigger incentive for me to do better next time than any caustic or stinging remark could have been.

Early in my time at Toronto, I made some cardboard polyhedral models for a talk that I gave back at McMaster. I showed them to Donald at one of his visits to my office. He was delighted with them, particularly a model that I copied from a display I had seen in Winnipeg a year earlier. That model consisted of two cubes of the same size, one of which could be unfolded into six pyramids and wrapped around the other to form a rhombic dodecahedron. For the next few years, whenever Coxeter travelled to give invited lectures elsewhere, he would borrow that model to take along with him. It travelled untold miles in his suitcase, but he always brought it back to my office after the trip was over. Sometimes it would come apart at an edge, and then Donald's thanks would also include an apology for damaging the model. In that case, I would soon repair the damage, so that it was ready for the next jaunt. Eventually however, the model just got so old that it fell completely apart, and that was the end of its travels.



By Asia Ivić Weiss and William Weiss

Donald Coxeter was the leading figure, indeed the architect, of geometry in the 20th century. He passed away peacefully at his home in Toronto on March 31, 2003 at the age of 96. His daughter Susan was at his side as she has been since the death of his beloved wife Rien.

Over a span of eighty years Coxeter made remarkable contributions to mathematics, and to geometry in particular. Written legacy of Coxeter includes over 200 research and survey papers as well as thirteen monographs translated to eight languages. He wrote numerous reviews of other publications

where his insights and reflections on the mathematical work of others was much appreciated. In 1974 Coxeter published what he considered his masterpiece, *Regular Complex Polytopes*. He worked on it for almost twenty years with the aim "...to construct it like a Bruckner symphony, with crescendos and climaxes, little foretastes of pleasure to come..." The exposition is beautiful, the design and presentation extraordinary.

Regular Complex Polytopes is a sequel to his famous *Regular Polytopes*, which for many of us had profound influence on both our research and our view of geometry. This book, first published in 1948, has been credited with reviving, some would say resurrecting, geometry in the twentieth century. It has drawn to geometry many mathematicians, among them John Conway and Peter McMullen who attest that the book had a major impact on their careers. Through *Regular Polytopes*, Coxeter established himself as a leading geometer. His work has had great influence outside geometry as well. With the publication of "Generators and Relations for Discrete Groups", written jointly with his student Willy Moser and published in 1957, he attracted attention of other mathematicians.

Undoubtedly, Coxeter will be best remembered for his work on regular polytopes and reflection groups. Around 1930, examining symmetries of regular and semi-regular polytopes led him to investigate properties of a group generated by reflections. These are special cases of what is now known as the famous Coxeter groups. In his approach he combined geometry and group theory resulting in the first comprehensive treatment of finite reflection groups. In 1933 he completely classified spherical and Euclidean reflection groups. The corresponding classification for the hyperbolic groups is yet to be completed.

Among the numerous original ideas and solutions to problems in geometry, some results of Coxeter deserve a

Coxeter's geometry classes were popular. He was so familiar with every aspect of what he taught that it seemed to be effortless for him. A typical class would begin with a question from one of us, which occurred to us from our notes of the previous lecture. Donald would answer the question, and then begin his lecture at the very point that was the object of the question. It all flowed along very smoothly, just as though (by some lucky accident) the question raised was a perfect introduction to the material that he had prepared for the class.

It was my good fortune not only to have Donald as a thesis supervisor, but also as a senior colleague at the University of Toronto, a relationship which ended only with his death last March. About the time that I received my degree and became a Lecturer at Toronto, Professor Coxeter (as I still addressed him) put his hand on my shoulder and asked me to call him Donald from then on. Comparing notes with other former Coxeter students, I find that this was a common experience, a sort of rite of passage.

In forty-eight years of close association with Donald Coxeter, I not only learned a lot of Geometry, but I also learned from his ordered life. One sign — to me — of his very tidy mind was the condition of his desk. Unlike most mathematicians I have known, Coxeter's desk was never cluttered, and when he went home in the evening, it was absolutely bare. Somehow, I associated this with his prolific output of Mathematics, and decided to emulate it. I still keep a tidy desk (most of the time), although I am not certain that it has helped my productivity.

The last time I saw Donald Coxeter was mid-December, 2002 in his home. He was suffering from many infirmities of old age, but was happy to see me. He was working on one last paper, but for once he found it hard to concentrate, and gratefully accepted help from some of his former students and colleagues. It was a small thing for us to do for him after all that he had done for us.



*Frederick Helson, John Chadam,
Ronnie Brown, Don Coxeter*

special mention. The construction of all uniform polyhedra, that is, of polyhedra with regular faces whose symmetry group is transitive on the vertices, was achieved jointly with M.S. Longuet-Higgins and J.C.P. Miller in 1954 (The completeness of the enumeration was proved in 1970s by Sopov and Skilling.) Also in 1954 he presented, as an invited speaker at the International Congress of Mathematicians in Amsterdam, the complete enumeration of hyperbolic tessellations. Coxeter will also be remembered for his many contributions to hyperbolic geometry and sphere packings (and hence to extreme forms and lattices), as well as graph theory and discrete and combinatorial geometry in general.

Coxeter's geometric intuition is legendary and he often disdained formal proof for those things his insight told him were obvious. When Asia was his graduate student she was given a paper in which Donald studied a geometric pattern of four mutually tangent circles first investigated by René Descartes. He extended this to an infinite sequence of circles in the plane each one tangent to the previous three and proved that the point of tangency of consecutive circles all lie upon a loxodromic (sometimes called equiangular or logarithmic) spiral. At the end of the paper he casually stated that a similar situation holds in three dimensions: the consecutive points of tangency of an infinite sequence of spheres, each tangent to the proceeding four, belong to an equiangular spiral on a cone. Asia found this statement impossible to verify. This may have been the only instance in which Coxeter's intuition failed him. In fact, she was able to show that these points belong to a loxodromic spiral on a sphere (a curve beginning at a pole and meeting each meridian at the same angle). Donald was surprised and pleased. To commemorate the discovery, Donald and Rien gave to us on our wedding day a crystal bowl in the shape of a sphere with loxodromes on its surface.

Later in life Donald revisited the subject. On his 90th birthday, the famous sculptor John Robinson presented Donald with *Firmament*, a sculpture of tangent spheres. This sculpture is now housed in the collection at York University. The collection also includes twenty-three miniature models of the stellated icosahedra. There are fifty-nine possible stellations of icosahedra; Coxeter was the first to complete the enumeration. These models were made by H.T. Flather, prior to the Second World War and shipped to Coxeter for safekeeping just before the war. After the end of the war Flather decided to leave them with Coxeter. He made another (complete) set of the icosahedra, which are housed at Cambridge University. Others, including M.C. Escher and Buckminster Fuller also gave original works of art to Donald Coxeter.

Reminiscing about Donald, we often recall the time Asia told him that they might have to postpone their next regular Friday meeting because she was soon due to give birth to our first child. When he realized that she might have to spend several hours in the labour room waiting for the birth, he immediately went to his filing cabinet. Withdrawing his latest

continued on next page

preprint, he handed it to Asia, “This is something you can read while waiting.” Asia tried to explain that it may be difficult to concentrate upon mathematics at such a time, but Donald reassured her “Don’t worry. It is easy to read, mostly a survey.” After a successful birth we telephoned him from the hospital room. He congratulated us and inquired about Asia. Being told that she was in good health, he replied “Wonderful, I shall be in my office on Friday.” We shall never forget hearing Rien’s voice over the telephone screaming “Donald!” Immediately he corrected himself, “I shall also be there next Friday.”

Donald was very fond of animals and enjoyed fast cars. His life was filled with music and art. But his passion for geometry was above all. He put finishing touches on his last paper the day before his death. It will appear in the proceedings of the conference in Budapest in 2002 celebrating the 200th anniversary of the birth of the famous Hungarian geometer János Bolyai. He was honoured as the first plenary speaker at the conference. Our mentor, friend and colleague, Donald Coxeter will be deeply missed; the memory of him, cherished.

CMS AWARDS

Le Prix Krieger-Nelson / The Krieger-Nelson Prize 2003



Citation

Leah Edelstein-Keshet is in the front rank of theoretical biologists world-wide. She has an excellent ability to abstract the sense of a biological problem into a well-posed mathematical problem suitable for analysis and modelling. She has investigated new and challenging biological problems involving a diversity of mathematical techniques. She uses all types of methods, from rigorous analysis to simulations.

Her research has greatly influenced people in thinking about biological phenomena in a mathematical way. She has also written what is regarded as the best textbook on biological modelling. It has been called “a remarkable demonstration of her deep understanding of a staggering range of problems in mathematical biology”.

Biographical Information

Dr. Leah Keshet obtained her B.Sc. from Dalhousie University in 1974, and her Ph.D. from the Weizmann Institute in 1982. Prior to joining the University of

British Columbia in 1989, she was a faculty member at Duke University.

Leah Keshet attained the rank of full professor in 1995 and is Director of the MITACS project "Biomedical Models of Cellular and Physiological Systems in Health and Disease", which uses mathematical modelling and analysis for various biomedical problems. She was an invited plenary speaker at the 2000 International Congress of Applied Mathematics in Edinburgh.

Présentation

Leah Keshet est une sommité mondiale de la biologie théorique. Elle excelle à résumer le sens d’un problème biologique en un problème mathématique bien formulé qui se prête à l’analyse et à la modélisation. Elle étudie de nouveaux problèmes biologiques difficiles en faisant appel à diverses techniques mathématiques. Elle se sert de méthodes très diversifiées, allant de l’analyse rigoureuse à la simulation.

Ses recherches ont amené un grand nombre de personnes à envisager des phénomènes biologiques d’un point de vue mathématique. Elle est également l’auteure d’un manuel de modélisation biologique considéré comme le meilleur qui soit et décrit comme « une manifestation remarquable de sa compréhension approfondie d’un éventail incommensurable de problèmes de biologie mathématique ».

Note biographique

La professeure Leah Keshet a obtenu son baccalauréat en sciences de l'Université Dalhousie en 1974 et son doctorat de l'Institut Weizmann en 1982. Avant son arrivée à l'Université de la Colombie-Britannique en 1989, elle a enseigné à l'Université Duke.

Devenue professeure titulaire en 1995, Leah Keshet est en ce moment directrice du projet « Biomedical Models of Cel-

lular and Physiological Systems in Health and Disease » du réseau MITACS, dans lequel on utilise des modèles et analyses mathématiques pour solutionner divers problèmes biomédicaux. En 2000, elle a été conférencière principale invitée au Congrès international de mathématiques appliquées d'Édimbourg.



CMS 2003 Jeffery-Williams Prize Prix de la SMC Jeffery-Williams 2003

Citation

Ram Murty has made systematic, significant and extensive contributions to the central and difficult area of number theory dealing with L-functions and to problems in closely related areas of arithmetic algebraic geometry. His work is in the domain of algebraic and analytic number theory, in which algebra and analysis are fused in the study of number theory. His contributions are of significant depth and beauty, and have been of interest to a broad range of mathematicians.

Ram Murty has made many important research contributions. In collaboration with his brother, Kumar Murty, and Rajiv Gupta, their unconditional proofs related to Artin's 1920's conjecture on primitive roots, have been called "truly spectacular".

Biographical Information

Dr. Ram Murty obtained his BSc from Carleton University in 1976, and his Ph.D. from MIT in 1980. Prior to joining Queen's University in 1996, he was a faculty member at McGill University.

Ram Murty attained the rank of full professor in 1989 and was elected as a fellow of the Royal Society of Canada in 1990. He was the winner of the 1988 CMS Coxeter-James Prize. was a Steacie Fellow in 1991, and received a Killam Research Fellowship in 1998.

Présentation

Ram Murty a contribué de façon systématique, considérable et exhaustive au domaine central et difficile de la théorie des nombres en rapport avec les fonctions L et à des problèmes dans des domaines très rapprochés de la géométrie arithmétique algébrique. Ses travaux portent sur la théorie des nombres (algébriques et analytiques), à laquelle il intègre l'algèbre et l'analyse. D'une profondeur et d'une élégance considérables, ses réalisations suscitent l'intérêt d'un large éventail de mathématiciens.

Ram Murty a beaucoup apporté à la recherche. En collaboration avec son frère, Kumar Murty, et Rajiv Gupta, il a établi des preuves inconditionnelles se rapportant à la conjecture d'Artin datant des années 1920 sur les racines primitives, que l'on a qualifiées de « véritablement spectaculaires ».

Note biographique

Le professeur Ram Murty a obtenu son baccalauréat en sciences de l'Université Carleton en 1976 et son doctorat du MIT en 1980. Avant d'arriver à l'Université Queen's, en 1996, il a enseigné à l'Université McGill.

Ram Murty est devenu professeur titulaire en 1989 et membre de la Société royale du Canada en 1990. Il a remporté le prix Coxeter-James de la SMC en 1988, en plus de recevoir la bourse Steacie en 1991 et la bourse de recherche Killam en 1998.

EDUCATION NOTES

Ed Barbeau

The myth of ability and JUMP

Readers have met John Mighton in this column almost two years ago with the publication of his manifesto on the ability of any young person to master mathematics (see *Breaking the cycle of ignorance*, these Notes 33:6 (October, 2001), 9-10, 13. Since then, his tutoring program *JUMP* (“Junior undiscovered math prodigies”) has met with significant success and he has now incorporated his philosophy into a brief and highly readable book, along with samples of the materials that he uses with his young pupils.

John Mighton, *The myth of ability; nurturing mathematical talent in every child*. House of Anansi Press Inc., 2003 209 pages – ISBN 0-88784-693-9.

Distributed in Canada by Publishing Group Canada
205A Carlton Street, Toronto, ON M5A 2L1
(416-934-9900/1-800-663-5714; fax 1-800-565-3770)

The introduction of the book describes how Mighton started his tutoring program in his apartment in 1998 for the benefit of children of working families and how it grew in four years to become established in 12 inner-city Toronto schools to serve 1500 pupils with the aid of 200 volunteers. His success is based on the faithful application of certain principles: (1) Assume that pupils have the ability to succeed and encourage them through difficulties with frequent praise; (2) Begin with challenging material, but graduate it into a succession of manageable simple steps to be mastered in turn; (3) Provide pupils with adequate tutorial support, and make sure they practise the work until it is consolidated before proceeding to a new topic. In his view, “a program that allows the children the luxury of success also allows the luxury of giving them praise” (p. 44).

Although it might appear that Mighton is advocating the use of drill and rote learning in place of the current trend to the solution of open-ended problems, he has no quarrel with the ideals inherent in modern curriculum development, but criticizes the conceptual leaps that pupils are often asked to make and the lack of preparation that many teachers have to implement it. Part of the purpose of this book is to show how, with suitable training, one does not require a heavy mathematical background to teach effectively.

The second part of the book reproduces some of the units from the *JUMP* Teaching Manual. The first one on fractions is long and begins modestly. Pupils are not required to know a lot of basic arithmetic; only simple multiples of 2, 3 and 5 are used as denominators to begin

with and it is enough that children can count up these on the fingers of one hand. Once they learn how to name fractions, with the aid of evenly-partitioned geometrical figures, they learn to add them, first when the denominators are the same and then when they differ. The pupils then move on to equivalent fractions, reduced fractions, mixed numbers and comparison of size. Other sections deal with multiplication and division, coordinate systems, ratios and percentages, logic and systematic search, and finite state automata.

Despite appearances, it would be unjust to dismiss the teaching as rule-bound. Mighton conjectures that something like chaos theory might account for sudden spurts of progress exhibited by pupils. By establishing a clear regime and challenging the culture of failure, he leaves room for students to reach their own understanding and fashion their own victories. The *JUMP* program is a noble enterprise that promises to lay a solid foundation for the mathematical attainment of many students, and this column will keep you abreast of future developments.

Canadian School Mathematics Forum: Montreal I

On May 16-18, 2003, about a dozen dozen individuals with a concern in mathematics education covered on Montreal to attend the Canadian School Mathematics Forum, to examine issues about the teaching and learning of mathematics, and to devise a plan of action, the fruits of which will be the business of a second forum on Toronto in 2005. Co-chairs Christiane Rousseau (President of the CMS) and George Bluman (CMS Vice-president for the West) organized the conference along four themes: Comparison of experiences; Critical thinking; Mathematics in the modern school — goals and challenges; and Teachers’ education and development. Each of the participants joined one of sixteen working groups devoted to a particular concern. Using the keynote addresses as touchstones, the groups explored areas of development over the next two years. Details can be had from the website of the Society; in these *Notes*, I plan to focus on particular issues as they arise and follow developments over the next two years. I will begin by commenting on two of the keynote speeches.

Since Liping Ma was unable to give the planned invited address, the organizers were fortunate to obtain an excellent substitute in the person of Frederick Leung of the Faculty of Education at the University of Hong Kong, currently a Fulbright Scholar in Los Angeles, CA. With reference to the 1999 *TIMSS* Grade 8 video study of teaching in seven countries, he spoke on the characteristics of pedagogy in Hong Kong. (Visit <http://timss.bc.edu>) There one finds mainly whole-class interaction where the

teacher does most of the talking. Students solve procedural problems unrelated to “real life”. However, this rather regimented description is offset by a number of indicators of quality. The content is relatively advanced with about 15% of the lessons devoted to deductive reasoning. The lessons are quite coherent, with about 90% of them thematically related, and the presentation of the teachers was fully developed with good use of mathematical argument. Students were more likely to be engaged. In short, the quality of education was consistently high.

A replication of the study of Liping Ma (see these *Notes*, March, 2000, or visit <http://cms.math.ca/Publications/Reviews>) was implemented with nine teachers in each of Hong Kong and Korea. It revealed that the teachers understood the mathematics, but taught procedurally. Leung put this down to “East Asian pragmatism” where a curriculum had to be covered, so that one must not confuse the students but give clear and simple rules. However, it is not a matter of mindless rote, but rather a steady growth in understanding as pupils gain competence through practice. Underlying their success are sound mathematics, careful orchestration of the curriculum, centralized education systems and Confucian values that prize education, exalt scholars and teachers, encourage a serious outlook and foster an expectation of achievement.

The keynote address by Hyman Bass and Deborah Ball of the University of Michigan was entitled, “A practice-based theory of mathematical knowledge for teachers”. They argued that teachers face problems and use mathematics in ways distinctly different from other professions. Because they need to be sensitive to context, they must be fluent with mathematical representations, language and reasoning, so that they can ply their trade with a great deal of flexibility. The research of Ball and Bass involves an analysis of the mathematical content inherent in pedagogical settings, so that teachers can better determine appropriate methods and diagnose student difficulties. How does one represent $11/2 \times 2/3$ or $38 \div 4$? How can one put a pupil on the right track who has made a certain type of mathematical error? The details of the talk can be had at <http://www-personal.umich.edu/~dball>.

Mathematical careers

Most of us have difficulty responding to students asking about the careers their mathematics degrees lead to, and several of us have resolved to organize such information and make it available. Fortunately, Andrew Sterrett, professor-emeritus at Denison University in Granville, OH has already done a lot of the donkey work over many years and persuaded the Mathematical Association of America to publish career profiles, first as a sequence of broadsheets, then as a pamphlet and finally as a book. A new edition of the book has just appeared.

101 Careers in Mathematics, Second edition

Andrew Sterrett, editor.

Classroom Resources Materials Series.

Mathematical Association of America

Washington, 2003. xiii+339 pages ISBN 0-88385-728-6

Catalogue Code: OCM/JR

List price: US \$33.95; Member price: US \$26.95

This can be ordered by phone (1-800-331-1622) or off the web (www.maa.org).

Besides the 101 personal profiles, there are two articles by Mary Schilling (Director of Career Development Center at Denison University) on seven steps to finding a job and on interviewing tips, as well as two articles that collect up advice from mathematics majors and from recently employed mathematics graduates.

So what do mathematicians do besides teach, do research at universities, and program computers? Perusal of the pages reveals employees of an aluminum company (operations research), the National Institute of Standards and Technology, law (mathematics as training to grasp technical concepts), financial institutions, publishing, the arts, L.L. Bean (inventory control), medical and pharmaceutical enterprises, security systems, insurance companies and an air traffic management company. At least two Canadians are featured: Yves Chiricota, a project manager at PADF System Technologies and professor at the Université de Québec à Chicoutimi, and Peter Rosenthal, lawyer and professor at the University of Toronto. Many of the profilees are in the engineering field, an indication that this area has a sufficiently intensive mathematical component as to warrant a good background in applied mathematics rather than just straight engineering.

The advice in the Appendix is practical and useful. Anita Solow drew the following conclusions from her interviews with recent graduates:

“What struck me about these interviews was the number of times that it was mentioned that majoring in mathematics demonstrates to an employer that the person is not afraid of intellectual challenges. Employers seem to respect mathematics majors, not for what they have learned, but for the thinking skills that they have acquired. It was also stated several times that majoring in mathematics provides solid analytical training which enables a person to learn what they need on the job. So the employers’ perceptions of the value of majoring in mathematics is well founded!”

Finally, a word of advice from Sue Sierra of the University of Michigan: “The biggest thing is to be open-minded — don’t rule out things too soon.”

Problems Galore!

The Mathematical Association of America has recently released two marvellous problems books that readers of these Notes can apply to their own recreation, teaching or coaching.

Paul Vanderlind, Richard Guy, Loren Larson,

The inquisitive problem solver.

MAA Problem Books,

Mathematical Association of America

2002 vii + 327 pages

ISBN 0-88385-8061 Catalogue code: IPS

List price: US \$34.95

Paul Vanderlind is a Polish emigré in Sweden, who published a preliminary Swedish version and gave a copy to Loren Larson. Larson translated it into English and submitted the manuscript to the MAA, where Richard Guy saw its possibilities and recommended a rewriting to bring out the mathematics behind the solutions. The final result is a collection of 28 recreational problems, many supplied with hints and riders, and all solved. A 27-page “treasury” contains definitions, techniques and tricks of the trade to help the solver. This is an excellent purchase for amateurs,

teachers at all levels and their students.

Svetoslav Savchev, Titu Andreescu, *Mathematical miniatures.*

Anneli Lax New Mathematical Library #43

MAA, 2003 viii+223 pages

ISBN 0-88385-645-X

Catalogue code: NML-43/JR

List price: US \$28.50

This rich volume consists of fifty essays organized around some theme interlaced with “coffee breaks” of short sets of problems followed by their solutions. In each essay, the authors conduct a conversation to take the reader through a related set of results and problems, revealing some ingenious uses of logical and technical tools. This volume is for the serious problem solver with a good secondary background and experience with problems on contests or in journals such as *Crux* or those of the MAA. Because each section is self-contained, it is a good book for dipping rather than taking on the formidable task of reading it straight through. Those familiar with the books of Ross Honsberger will find this somewhat heavier, but equally pleasurable.

DU BUREAU DE LA PRÉSIDENTE *(suite)*

porte le nom de Projet NExTMAC (New Experiences in Teaching Mathematics Across Canada), a pour but d'aider les jeunes professeurs à rehausser la qualité et l'efficacité de leur enseignement. Quant à la quatrième conférence commémorative Geoffrey J. Butler, elle s'est déroulée après la Réunion, soit du 17 au 21 juin à l'Université de l'Alberta.

J'étais très heureuse d'annoncer la création du nouveau Prix d'excellence en enseignement de la SMC commandité par Nelson & Brooks/Cole, en présence de Janet Piper de Nelson Thompson Learning. On a fait l'annonce officielle du prix à Edmonton, au banquet de la Réunion d'été, en remettant à tous les participants des affiches promotionnelles. Le prix récompense des contributions exceptionnelles et soutenues en enseignement au collégial et au premier cycle universitaire dans un établissement canadien. La date limite de participation au premier concours est fixée au 15 novembre. Nous espérons recevoir de nombreuses candidatures, qui témoigneront de l'importance accordée à l'enseignement des mathématiques au niveau collégial et au premier cycle universitaire dans de nombreux établissements du pays.

Du 16 au 18 mai 2003, 148 personnes ont participé au Forum canadien sur l'enseignement des mathématiques, notamment des enseignants du primaire et du secondaire, des professeurs de mathématiques et d'éducation à l'université,

des administrateurs de commissions scolaires, des fonctionnaires provinciaux, des représentants d'associations provinciales d'enseignants de mathématiques, ainsi que quelques délégués du secteur privé, des conseils de recherche et des médias. Pierre Reid, ministre de l'Éducation du Québec et président d'honneur du Forum, a présenté celui qui allait prononcer la conférence populaire intitulée « Le plaisir des mathématiques », Jean-Marie de Koninck. Le Forum a permis aux participants de comparer la situation qui prévaut d'une région à l'autre du pays, de mettre en commun des pratiques exemplaires et de créer des liens avec des intervenants de tous les paliers d'enseignement et de diverses provinces, grâce à l'élimination des traditionnelles frontières provinciales. Des groupes de travail ont posé plusieurs problématiques que des sous-groupes étudieront plus en détails et présenteront à la seconde rencontre, accompagnées de pistes d'intervention. Le compte rendu du Forum sera largement diffusé sous forme électronique et conventionnelle. Au nom de tous les participants au Forum et de ceux et celles qui croient que l'enseignement des mathématiques est d'une importance capitale pour le Canada, je remercie les membres du comité scientifique et les organisateurs locaux, en particulier Louis Charbonneau de l'UQAM, à qui l'on doit une grande part de la réussite du Forum.

Les participants ont abordé en plénières un large éventail de sujets. Frederick Leung a présenté dans sa conférence

les résultats de sa réflexion sur la réussite remarquable des élèves asiatiques; il a notamment souligné la formation mathématique exceptionnelle des enseignants asiatiques. Les participants à une table ronde ont ensuite fait état de la situation qui prévaut dans les grandes régions du pays; ils ont fait ressortir la similitude entre de nombreux problèmes propres à l'enseignement des mathématiques dans toutes les régions du pays, et la réussite de quelques projets spéciaux. La conférence plénière de Jean-Pierre Kahane a montré comment les cours de mathématiques fournissent toujours aux élèves des éléments qui leur sont indispensables pour fonctionner et innover dans le monde moderne. Alan Bernardi (Bell) a présenté, dans sa réplique, la vaste gamme d'activités de Bell qui nécessitent des analyses mathématiques complexes. Dans sa réponse écrite aux participants, Benoît Saint-Pierre, directeur de l'ingénierie chez Alcan, a lui aussi renforcé l'importance de la formation mathématique.

Un panel a porté sur plusieurs objectifs et enjeux de l'école moderne : l'enrichissement (Ravi Vakil), l'enseignement des mathématiques aux élèves autochtones (Corinne Jetté), l'enseignement à l'heure de la réforme (André Deschênes), comment rehausser à la fois l'intérêt pour les cours de mathématiques et la numératie des élèves (Kanwal Neel). Hyman Bass et Deborah Ball ont abordé le thème de la formation et du perfectionnement des maîtres, ainsi que le niveau de connaissances mathématiques que doivent posséder les enseignants du primaire pour bien enseigner les mathématiques. Le dernier jour, les participants se sont penchés, en panels, sur le thème « Une vision vers le futur ».

Le premier panel (Vers le second Forum : comment accroître la collaboration interniveau et interprovinciale entre ceux et celles qui enseignent les mathématiques?) a porté sur les questions suivantes : « Devrions-nous avoir une sous-commission canadienne pour la CIEM? » (Bernard Hodgson); « Comment resserrer les liens entre les professeurs d'université et les enseignants du primaire-secondaire? » (John Grant McLoughlin); « Comment les associations d'enseignants pourraient-elles collaborer davantage? » (Stewart Craven); « Comment le Forum de Québec en 1995 a-t-il contribué au dynamisme du milieu de l'enseignement des mathématiques en Colombie-Britannique au cours des années qui l'ont suivi? » (Malgorzata Dubiel).

Quant au second panel, « Comment amener les conclusions du Forum jusqu'au public? Comment renforcer l'importance de l'apprentissage des mathématiques dans nos écoles? », il a réuni les personnes suivantes : Isabelle Blain, vice-présidente du CRSNG, Ivar Ekeland, professeur (UBC), Véronique Morin, Radio-Canada, présidente de l'Association canadienne des rédacteurs scientifiques, Heather Sokoloff, The National Post.

Répartis en 16 groupes de travail, les participants ont également abordé des sujets de toutes sortes en rapport avec l'enseignement des mathématiques (l'enseignement au

primaire, la préparation des élèves aux études en sciences et en génie, les mathématiques pour le citoyen actif, l'enseignement des mathématiques aux élèves autochtones, etc.).

Voici les grandes lignes des travaux issus du Forum

- L'enseignement des mathématiques aux élèves autochtones occupera une place importante au pays au cours des prochaines décennies, car ces communautés doivent relever le niveau de scolarité de leurs membres si elles veulent créer des emplois chez elles. Par contre, la marche sera trop haute pour les élèves autochtones si nous ne prenons pas des mesures particulières pour adapter l'enseignement à leur culture et accroître leur intérêt pour l'école.
- Perfectionnement des enseignants du primaire : nous élaborerons des lignes directrices à cet effet.
- Il faut profiter de la lancée du Forum pour poursuivre le dialogue avec les associations provinciales et les ministères de l'Éducation des provinces.
- La SMC est appelée à jouer un rôle de leadership pour promouvoir l'enseignement des mathématiques au pays à divers niveaux, par exemple en facilitant le dialogue entre les intervenants du milieu de l'enseignement des mathématiques au Canada, y compris les ceux des associations provinciales et des ministères de l'Éducation. Grâce à ses alliances avec le secteur privé, la SMC pourra faire connaître la position et les besoins des entreprises qui font de la recherche et du développement. Ce rôle de leadership devra se faire dans le respect des responsabilités provinciales et des différences culturelles.
- Une quantité considérable de matériel d'excellente qualité est produite dans toutes les régions du pays : il faudrait créer un réseau favorisant le partage de ce matériel et offrir aux enseignants des cours de perfectionnement pertinents.

Les gagnants du second concours de la Bourse CRSNG-SMC Math à Moscou sont Thomas Zamojski (McGill) et Kristin Shaw (UBC). Ces deux étudiants passeront la session d'automne 2003 à l'Université indépendante de Moscou. Jonathan Kavanagh, premier lauréat de cette bourse, a étudié à Moscou toute la session d'hiver 2003. Il nous fait rapport de son expérience.

À l'assemblée générale annuelle du 15 juin, tenue à Edmonton, les membres ont accepté le rapport du secrétaire d'élection. J'ai le grand plaisir de souhaiter la bienvenue aux nouveaux membres du Comité exécutif : Eddy Campbell (Queen's), président élu; Jon Thompson (UNB), vice-président Atlantique; Steven Boyer (UQAM), vice-président Québec; Kathryn Hare (Waterloo), vice-présidente Ontario; Samuel Chen, vice-président Ouest. Je souhaite également la bienvenue aux nouveaux membres du Conseil d'administration.

J'aimerais profiter de l'occasion pour remercier les membres sortants du Comité exécutif, en particulier Jonathan Borwein, qui a terminé un mandat de quatre ans comme président élu, président et président sortant. Au cours des quatre dernières années, il a contribué de façon remarquable à toutes les activités de la SMC. Merci aussi aux quatre vice-présidents sortants, qui ont tous participé activement à nos activités : Edgar Goodaire (Memorial), Bernard Hodgson (Laval), James Mingo (Queen's) et George Bluman (UBC).

Voici le premier dossier du nouveau Comité exécutif pour l'année 2003-2004.

Groupe de travail sur l'avenir de la SMC et ses effets sur les activités du bureau

par Eddy Campbell et Christiane Rousseau

La Société compte de nombreuses années de succès et a entrepris un grand nombre d'initiatives au cours des dernières années : forums nationaux sur l'enseignement, appui à des camps de mathématiques, programmes exhaustifs de concours, etc. Depuis plusieurs années, notre Réunion d'été attire autour de 400 participants et celle d'hiver, environ 300. Pendant trois années consécutives, nous organiserons trois rassemblements par année. En effet, en plus de nos deux réunions semestrielles, il y aura deux forums, l'un en 2003 et l'autre en 2005, ainsi qu'une rencontre qui se tiendra à Toulouse en 2004. Certains de nos projets pourraient mener à une augmentation de nos activités de publication, qui se traduirait soit par une hausse du nombre de nos publications, soit par la possibilité d'offrir notre vaste expérience à des sociétés et autres organismes et à leurs comités de publication. Nous pourrions aussi intensifier notre collaboration avec d'autres sociétés professionnelles en partageant l'expérience de notre personnel et nos ressources administratives. Nous étudions également la possibilité de devenir un organisme-cadre, ou à tout le moins d'aider les associations provinciales d'enseignants à unir leurs efforts. Ces possibilités témoignent de la réputation dont nous jouissons auprès d'autres grandes

communautés.

Ces activités et les attrayantes possibilités qui en découlent sont accueillies avec enthousiasme par les membres de notre société et au-delà. En général, la SMC est gérée de façon prudente : on juge chaque proposition d'activité d'après ses avantages par rapport aux autres activités de la Société, on en évalue le coût, et l'on étudie la situation financière ainsi que les avantages pour la Société avant d'approuver toute activité. Nous revoyons fréquemment notre palette d'activités, dissolvons ou restructurons les comités devenus moins pertinents et réorganisons nos activités administratives en fonction des besoins. En particulier, dans le cadre de l'examen stratégique de l'ensemble de nos activités mené en 1999, un groupe de travail s'est penché sur le rôle et le fonctionnement de notre bureau administratif et a produit un rapport que l'on peut lire au <http://www.cms.math.ca/Reports/.f>. Il devient de plus en plus clair, toutefois, que nous atteindrons très bientôt la limite de ce qu'il est possible de faire avec le personnel et les locaux dont nous disposons en ce moment. Nous avons donc formé le Groupe de travail sur l'avenir de la SMC et ses effets sur les activités du bureau, dont le mandat consiste à mettre à jour les rapports des groupes de travail 6 et 8 de 1999 : www.cms.math.ca/Projects/1998/tf6-report.html et www.cms.math.ca/Reports/1998/tf8report.html [anglais].

Vos commentaires et opinions quant à nos futures orientations seront grandement appréciés. Voici quelques questions auxquelles nous aimerions plus précisément avoir des réponses :

1. Si vous êtes en faveur d'une intensification des activités de la SMC, dans quel secteur d'activité souhaiteriez-vous voir cette intensification?
2. Si vous ne souhaitez pas une intensification de nos activités (ce qui pourrait tout de même entraîner des choix), êtes-vous satisfait des activités actuelles de la SMC ou souhaiteriez-vous plutôt que nous en laissions tomber certaines afin de nous concentrer sur des nouvelles?

The most up-to-date information concerning the programmes, including detailed schedules, will be made available at the meeting web site: www.cms.math.ca/Events/winter03/

Meeting registration forms and hotel accommodation forms are also available on the web site, along with on-line forms for registration and submission of abstracts.

Vous trouverez l'information la plus récente sur les programmes, y compris les horaires, sur le site Web suivant: www.smc.math.ca/Reunions/hiver03/

Vous trouverez les formulaires d'inscription et de réservation d'hôtel sur notre site Web, tout comme les formulaires électroniques d'inscription et de présentation des résumés.

RÉUNION D'HIVER 2003 DE LA SMC - DU 6 AU 8 DÉCEMBRE

**Simon Fraser University
Harbour Centre Campus 515 rue West Hastings
Vancouver (Colombie-Britannique)**

Au nom de l'Université Simon Fraser, le Département de mathématiques souhaite inviter tous les chercheurs, professeurs et étudiants à la Réunion d'hiver 2003 de la Société mathématique du Canada (SMC).

Les membres du département se font une joie de recevoir à nouveau les participants au Harbour Campus, au centre-ville de Vancouver, l'une des plus belles villes du Canada.

Conformément au format habituel, la Réunion comprendra de nombreux symposiums, des communications libres, au moins six conférences principales, un mini-cours en cryptologie ainsi que les conférences des lauréats des prix Coxeter-James et de Doctorat.

Toutes les activités au programme scientifique se dérouleront au Harbour Center de l'Université Simon Fraser, 515, rue Hastings Ouest, Vancouver (Colombie-Britannique). D'autres activités qui précéderont la Réunion ainsi que le lunch des participants et le banquet auront lieu à l'Hôtel Pan Pacific, situé au 300-999 Canada Place.

Vous trouverez l'information la plus récente sur les programmes, y compris les horaires, sur le site Web suivant : <http://cms.math.ca/Reunions/hiver03/>.

Vous trouverez les formulaires d'inscription et de réservation d'hôtel dans le numéro de septembre 2003 des Notes de la SMC. Ils seront aussi publiés sur notre site Web, tout comme les formulaires électroniques d'inscription et de présentation des résumés.

Conférenciers principaux

Tom Archibald (Université Acadia), Deborah Ball (Michigan) et Hyman Bass (Michigan), Robert Calderbank (Laboratoires AT&T, NJ), Andrew Granville (Université de Montréal), Madhu Sudan (MIT).

Prix

La conférence Coxeter-James de la SMC sera donnée par Jingyi Chen, de l'Université de la Colombie-Britannique.

Le Prix de doctorat sera remis à Alina Carmen Cojocaru, de l'Université Queen's.

Symposia

Le Comité de coordination a organisé des symposiums sur les thèmes qui suivent. Voici la liste préliminaire des conférenciers. Si on est intéressé à faire un exposé comme conférencier invité dans l'un des symposiums, on peut en faire la demande auprès des organisateurs de ce symposium.

Combinatoire

Org: Petr Lisonek (Simon Fraser)
et Brett Stevens (Carleton)

Richard Anstee (UBC), Francois Bergeron (UQAM), Nantel Bergeron (York), Dalibor Froncek (Minnesota), Jonathan Jedwab (Simon Fraser), Marni Mishna (UQAM), Frank Ruskey (Victoria), Nabil Shalaby (Memorial), John van Rees (Manitoba), Timothy Walsh (UQAM), David Wehlau (Queen's), Julian West (Malaspina).

Algèbre computationnelle

Org: Michael Monagan (Simon Fraser)

Systèmes dynamiques, Mécanique céleste

Org: Florin Diacu (Victoria)

Larry Bates (Calgary), Jacques Belair (Montreal), Wu Jianhong (York), Tomasz Kaczynski (Sherbrooke), Bill Langford (Guelph), Angelo Mingarelli (Carleton), Richard Montgomery (California-Santa Cruz), Dan Offin (Queens), Juan-Pablo Ortega (CNRS, Nice, France), George Patrick (Saskatchewan), Ernesto Perez-Chavela (UAM, Mexico City), Mark Roberts (Surrey), Christiane Rousseau (Montreal), Manuele Santoprete (California-Irvine), Dana Schlomiuk (Montreal), Tanya Schmah (Warwick), Cristina Stoica (Surrey), Andre Vanderbauwhede (Gent), Gail Wolkowicz (McMaster).

Enseignement des mathématiques

Org: Malgorzata Dubiel (Simon Fraser)

Graphes et matroïdes

Org: Luis Goddyn (Simon Fraser)
et Ladislav Stacho (Simon Fraser)

Kathie Cameron (Waterloo), Penny Haxell (Waterloo), Peter Horak (Washington), Jing Huang (Victoria), Sandra Kingan (Pennsylvania State), Gary McGillivray (Victoria), Sean McGuinness (Adelphi), Jenny McNulty (Montana), Wendy Myrvold (Victoria), Nancy Neudauer (Pacific), Ortrud Oellermann (Winnipeg), Bruce Reed (McGill), Bing Zhou (Trent).

Analyse harmonique

Org: Izabella Laba (UBC) et Alex Iosevich (Missouri-Columbia)

Michael Christ (California-Berkeley), James Colliander (Toronto), Walter Craig (McMaster), Galia Dafni (Concordia), Andrea Fraser (Dalhousie), Steve Hofmann (Missouri-Columbia), Victor Ivrii (Toronto), Krop, Elliot (Washington), Michael Lacey (Georgia Tech), Camil Muscalu (UCLA), Malabika Pramanik (Wisconsin-Madison), Eric Sawyer (McMaster), Andreas Seeger (Wisconsin-Madison), Gigliola Staffilani (MIT), Daniel Tataru (California-Berkeley), Gunther Uhlmann (Washington), Steve Wainger (Wisconsin-Madison).

Histoire des mathématiques

Org: Len Berggren (Simon Fraser)

Tom Archibald (Acadia), J.L. Berggren (Simon Fraser), Lawrence D'Antonio (Ramapo College of New Jersey), Hardy Grant (York), Alexander Jones (Toronto), Israel Kleiner (York), Gregory Moore (McMaster), Nathan Sidoli (Toronto), Glen Van Brummelen (Bennington College).

Biologie mathématique

Org: Leah Keshet (UBC)

Jacques Belair (Montreal), Fred Brauer (UBC), Roderick Edwards (Victoria), Pauline van den Driessche (Victoria).

Modèles pour la dynamique des fluides atmosphériques

Org: David Muraki (Simon Fraser)

Équations aux dérivées partielles non linéaires

Org: Rustum Choksi (Simon Fraser)
et Keith Promislow (Simon Fraser)

Stephen Gustafson (UBC), Robert Jerrard (Toronto), Nathan Kutz (Washington), Giovanni Leoni (Carnegie Mellon), Yi A. Li (Steven's Institute of Technology), Govind Menon (Wisconsin), Bob Pego (Maryland), Dmitry Pelinovski (McMaster), Arnd Scheel (Minnesota), Daniel Sporn (Brown).

Théorie des nombres

Org: Michael Bennett (UBC), Peter Borwein (Simon Fraser), David Boyd (UBC), Imin Chen (Simon Fraser), et Stephen Choi (Simon Fraser).

Amir Akbary (Lethbridge), Chantal David (Concordia), Karl Dilcher (Dalhousie), John Friedlander (Toronto), Ben Green (PIMS), Hershy Kisilevsky (Concordia), Claude Levesque (Laval), Frederich Littmann (PIMS), David McKinnon (Waterloo), Nathan Ng (Montreal), Robert Osburn (McMaster), Christopher Rowe (PIMS), Damien Roy (Ottawa), Cam Stewart (Waterloo), Hugh Williams (Calgary).

Algèbres d'opérateurs

Org: Marcelo Laca (Victoria) et Ian Putnam (Victoria)

Berndt Brenken (Calgary), Ken Davidson (Waterloo), Thierry Giordano (Ottawa), David Kerr (Rome), Mahmood Khoshkam (Saskatchewan), Michael Lamoureux (Calgary), Qing Lin (Selkirk College), Jamie Mingo (Queen's), Andu Nica (Waterloo), Igor Nikolaev (Calgary), Vladimir Pestov (Ottawa), John Phillips (Victoria), N.C. Phillips (Oregon), Jack Spielberg (Arizona State), Keith Taylor (Saskatchewan), Sam Walters (Northern British Columbia).

Cohomologie quantique et symétrie miroir

Org: Kai Behrend (UBC)

Jim Bryan (UBC), Ionut Ciocan-Fontanine (Minnesota), Alastair Craw (Utah), Chuck Doran (Washington), Barbara Fantechi (SISSA), Holger Kley (Colorado), Sandor Kovac (Washington), Ravi Vakil (Stanford).

Représentations d'algèbres associatives et sujets connexes

Org: Vlastimil Dlab (Carleton) et Shiping Liu (Sherbrooke)

Raymundo Bautista (UNAM, Morelia), Frauke Bleher (Ohio), Thomas Bruestle (Bielefeld), Ragnar Buchweitz (Toronto), Xueqing Chen (Ottawa), Andrew Dean (Nipissing), Harm Derksen (Michigan), Kent Fuller (Iowa), Christof Geiss (UNAM), Ron Gentle (EWU), Ellen Kirkman (Wake Forest), Size Li (Beijing Normal), Shiping Liu (Sherbrooke), Frank Marko (Pennsylvania State-Hazleton), Alex Martsinkovsky (Northeastern), Markus Schmidmeier (Florida), Paul Smith (Washington), Dan Zacharia (Syracuse), Rita Zuazua (UNAM, Morelia).

Algèbre universelle et théorie des treillis

Org: Jennifer Hyndman (UNBC)

Erin Beveridge (Northern British Columbia), Stan Burriss (Waterloo), David Casperson (Northern British Columbia), Dejan Delic (Ryerson), Ewa Graczyńska (Technical Univ of Opole), George Gratzner (Manitoba), Benoît Larose (Concordia), Ralph McKenzie (Vanderbilt), Michael Roddy (Brandon), Boza Tasic (Waterloo), Matt Valeriote (McMaster), Ross Willard (Waterloo), Shelly Wismath (Lethbridge).

Communications libres

(Org: Steven Ruuth, Université Simon Fraser)

Nous lançons un appel de communications libres de 15 minutes chacune. Les résumés devront respecter les critères précisés ci-dessous et nous parvenir au plus tard le 15 octobre 2003. Nous demandons à chacun de joindre au résumé le formulaire d'inscription et le règlement des frais pertinents.

Pour les communications libres, veuillez indiquer la classification de sujet AMS 2000 (veuillez consulter <http://www.ams.org/msc/>).

Mini-cours « Cryptologie »

Le nombre d'inscriptions au mini-cours est limité, et la priorité sera accordée aux personnes qui auront payé les droits d'inscription au mini-cours (150 \$). Les autres personnes qui s'inscrivent à l'ensemble des activités de la Réunion pourront demander d'assister au mini-cours; les billets seront alors distribués au premier arrivé, premier servi, selon les places disponibles.

Doug Stinson (Waterloo)
Introduction à la cryptologie

Neal Koblitz (Washington)
Cryptologie par courbes elliptiques

Hugh Williams (Calgary)
Théorie des nombres algorithmique

Mike Mosca (Waterloo)
Informatique quantique et cryptologie quantique.

Subventions pour étudiants diplômés

Les étudiants diplômés ont accès à un fonds limité pour financer une partie de leurs frais de déplacement et de séjour. Pour de plus amples renseignements, veuillez communiquer avec le Comité de coordination à l'adresse suivante : subventions-h03@smc.math.ca.

Les demandeurs doivent être des étudiants de deuxième ou de troisième cycle inscrits dans une université canadienne ou étrangère. Toute demande de financement doit être accompagnée d'une lettre du superviseur de l'étudiant ou de la personne responsable des études supérieures de son département, dans laquelle il ou elle indiquera le nom de l'étudiant, son domaine et son niveau d'études, en quoi la Réunion sera profitable à l'étudiant, si l'étudiant présentera une communication et si l'étudiant a accès à d'autres sources de financement de son université (bourses, subventions, etc.).

Cette lettre doit parvenir à la SMC avant le 1er novembre 2003 et peut être envoyée par courriel (subventions-h03@smc.math.ca). Les décisions seront annoncées au début de novembre.

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

Activités sociales

Une réception aura lieu le vendredi 5 décembre, de 19 h à 21 h, au « Cypress Suite » de l'Hôtel Pan Pacific.

Le lunch des participants se tiendra le samedi 6 décembre, de 12 h à 14 h, au « Governor General Suite » de l'Hôtel Pan Pacific. Ce repas est compris dans toutes les catégories d'inscription.

Un banquet aura lieu le dimanche 7 décembre, à compter de 19 h, au « Crystal Pavilion » de l'Hôtel Pan Pacific. Il y aura un service de bar payant à partir de 18 h. On peut se procurer des billets pour cette activité au coût de 60 \$ chacun.

Du café et des jus seront servis pendant les pauses. Nous avons réservé des billets pour un souper-croisière de Noël d'une durée de quatre heures sur le *Pride of Vancouver*, qui se joindra à la parade annuelle des bateaux de Noël. Nous ferons un tour dans la baie tout en mangeant, en chantant... et en dansant! Quelle merveilleuse façon de profiter du paysage et de fêter Noël! Un buffet « gourmet », des musiciens et des chants de Noël agrémenteront la soirée. Billets en vente au coût de 70 \$ chacun.

Un horaire détaillé de toutes les activités sociales et des autres événements est disponible à la page des horaires du site Web.

Séances de travail

La SMC organisera des séances de travail à l'occasion de cette Réunion.

Le Comité exécutif de la SMC tiendra une réunion le jeudi 4 décembre de 18 h à 22 h au « Governor General Suite » de l'Hôtel Pan Pacific.

Le lunch du Groupe de développement de la SMC aura lieu de 11 h à 13 h le vendredi 5 décembre au « Canada Suite » de l'Hôtel Pan Pacific.

La réunion du Conseil d'administration de la SMC aura lieu de 13 h 30 à 18 h 30 le vendredi 5 décembre au « Governor General Suite A+B » de l'Hôtel Pan Pacific.

Un horaire détaillé des séances de travail et des autres événements est disponible à la page des horaires du site Web.

Expositions

Exposants : les kiosques d'expositions seront ouverts aux heures indiqués dans le Centre Segal du Harbour Center de l'Université Simon Fraser.

Le comptoir d'adhésion et exposition de livres de la SMC sera ouvert pendant les trois jours de la réunion.

Envoi des résumés

Tous les résumés paraîtront dans le programme de la Réunion et seront accessibles sur le site Web.

Les participants peuvent envoyer leur résumé sous forme électronique en suivant les instructions ci-dessous. Il est préférable de remettre les résumés par voie électronique, mais si ce n'est pas possible, vous pouvez utiliser le formulaire standard que vous pourrez vous procurer au Bureau administratif de la SMC, 577, avenue King-Edward, bureau 109, Ottawa (Ontario) Canada K1N 6N5.

Les conférenciers sont priés de remettre leur résumé le plus tôt possible. La date limite est fixée au 15 octobre 2003. Les organisateurs remercient les conférenciers de bien vouloir respecter cette importante échéance.

Envoi électronique des résumés : Pour envoyer votre résumé, rendez-vous à la section des formulaires du site Web de la Réunion.

Vous pouvez aussi nous faire parvenir par courriel un fichier comprenant le nom de la séance, le nom du conférencier, son affiliation, son adresse complète, le titre de la conférence et le résumé à l'une des adresses suivantes : resumes-h03@smc.math.ca (conférenciers invités), ou cl-resumes-h03@smc.math.ca (communications libres).

N'oubliez pas de préciser le nom de la séance dans le sujet de votre message. Pour les communications libres, veuillez indiquer la classification de sujet AMS 2000 (veuillez consulter <http://www.ams.org/msc/>).

Important

Date limite de remise des résumés : 15 octobre 2003.

Inscription

Un formulaire d'inscription est disponible auprès de la SMC:

Bureau administratif de la SMC
577, av. King-Edward, bureau 109 C.P. 450, Succursale A,
Ottawa (Ontario) CANADA K1N 6N5

Téléphone : 613-562-5702 – Télécopieur : 613-565-1539
Courriel : reunions@smc.math.ca

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

Le paiement doit nous PARVENIR À OTTAWA au plus tard le 1er novembre pour que vous ayez droit aux tarifs réduits. Pour que votre inscription soit traitée avant la Réunion, votre paiement doit nous parvenir au plus tard le 28 novembre.

À quoi sert de s'inscrire à l'avance?

Vous vous demandez si vous devriez vous inscrire à l'avance ou le faire sur place? Voici quelques-uns des avantages de la préinscription :

	Avant le 1er nov	Après le 1er nov
Lunch des participants inclus		
Conférenciers principaux(1 billet de banquet inclus)	0 \$	0 \$
Conférenciers primés (2 billets de banquet inclus)	0 \$	0 \$
Conférenciers pour le mini-cours	0 \$	0 \$
Conférenciers	225 \$	225 \$
Organisateurs	150 \$	150 \$
Non-membres	450 \$	585 \$
Membres SMC/AMS/MAA avec subvention	300 \$	390 \$
Membres SMC/AMS/MAA sans subvention	150 \$	195 \$
Frais d'une journée	200 \$	260 \$
Postdocs, retraités	115 \$	150 \$
Enseignant(e)s (élém., second., CÉGEP), étudiant(e)s, sans-emploi	60 \$	80 \$
Mini-cours : Cryptologie SEULEMENT	150 \$	150 \$
Banquet (dimanche le 7 déc, Pan Pacific	60 \$	60 \$
Croisière (samedi le 6 déc)	70 \$	70 \$

N.B. L'inscription pour le mini-cours est limité.

SMC = Société mathématique du Canada

AMS = American Mathematical Society

MAA = Mathematical Association of America

- plusieurs personnes ont droit à une réduction en s'inscrivant avant la date limite pour tarifs réduits (voir section ci-dessus)
- votre nom figure dans la liste Web des participants sur le site Web
- votre trousse d'inscription sera déjà prête à votre arrivée le vendredi soir
- vous n'aurez pas besoin de faire la file pour vous inscrire à la première heure samedi matin
- les billets pour le banquet sont en vente maintenant, mais il pourrait ne plus en rester sur place

Pour ces raisons, nous vous encourageons à vous inscrire à l'avance, soit avant ou après la date limite pour tarifs réduits. Pour vous inscrire à l'avance et profiter des avantages ci-dessus, rendez-vous sur notre site Web et remplissez les formulaires appropriés.

Politique de remboursement

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

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

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

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

Hébergement

Il est fortement recommandé aux participants de réserver à l'avance. Des chambres ont été retenues aux endroits ci-dessous jusqu'aux dates précisées. Après ces dates, les hôtels ne prendront vos réservations que s'il reste des chambres et demanderont les tarifs affichés.

Les tarifs sont par nuit, par personne, et sont indiqués en devises canadiennes. Toute réservation doit être garantie par le paiement d'une nuit ou par une carte de crédit reconnue.

Les tarifs préférentiels s'appliquent aussi aux deux jours qui précèdent et qui suivent la Réunion. Au moment de réserver, VEUILLEZ DONNER LE CODE DE GROUPE.

Si votre premier choix d'hôtel n'est pas disponible, veuillez communiquer avec un autre établissement.

The Pan Pacific Vancouver

300 - 999 Canada Place, Vancouver
(Colombie-Britannique) Canada V6C 3B5
Points : Voir <http://www.panpacific.com/partners/index.html>
Arrivée : 15 h; départ : 12 h
Taxes applicables : TPS (7 %), taxe de séjour (10 %)
Réserver au plus tard le 3 novembre 2003
Code de groupe : Canadian Mathematical Society
Téléphone : 604-662-8111
Sans frais : 1-800-663-1515 (Canada) 1-800-937-1515 (É.-U.)
Télécopieur : 604-895-2469
Courriel : reservations@panpacific-hotel.com
Stationnement : 2 \$ la demi-heure, max. : 12 \$ / jour, 18 \$ / nuit
Service voiturier aussi offert (27 \$ / jour - entrées et sorties permises)

Tarifs

125 \$, cat. supérieure, 1 ou 2 personnes
155 \$, cat. supérieure, 3 personnes
185 \$, cat. supérieure, 4 personnes
135 \$, cat. de luxe, 1 ou 2 personnes
165 \$, cat. de luxe, 3 personnes
195 \$, cat. de luxe, 4 personnes

(Gratuit pour les enfants de moins de 19 ans qui partagent la chambre de leurs parents.)

Ramada Limited Downtown Vancouver

435 West Pender Street, Vancouver
(Colombie-Britannique) Canada V6B 1V2
Points : Aéroplan, Petro Points, Club Ramada
Arrivée : 15 h; départ : 12 h
Taxes applicables : TPS (7 %), taxe de séjour (10 %)
Réserver au plus tard le 3 novembre 2003
Code de groupe : 1030
Téléphone : 604-488-1088 sans frais : 1-888-389-5888
Télécopieur : 640-488-1090
Courriel : reservations@telus.net
Stationnement : service voiturier seulement
(15 \$ / nuit - entrées et sorties permises)
Déjeuner continental de luxe compris
Accès Internet haute vitesse sans fil compris
Chambres pour personnes handicapées disponibles

Tarifs

75 \$, 1 ou 2 personnes
90 \$, 3 personnes
105 \$, 4 personnes

(Gratuit pour les enfants de moins de 18 ans qui partagent la chambre de leurs parents.)

Réservations et annulations

Au Pan Pacific, les réservations sont garanties jusqu'à 18 h le jour d'arrivée prévu. Tout dépôt est remboursable sans pénalité si une personne annule sa réservation avant minuit la veille de son arrivée. Autrement, le dépôt en entier ne sera pas remboursé. Si une personne ne se présente pas à

l'hôtel, on lui facturera la première nuit de sa réservation.
NOTE : À votre arrivée, on vous demandera de confirmer votre date de départ. Toute modification apportée à ce moment-là sera apportée sans frais. Si vous décidez de quitter avant la date confirmée, on portera des frais de 100 \$ à votre carte de crédit.

Au Ramada Limited Downtown Vancouver, les réservations sont garanties jusqu'à 18 h le jour d'arrivée prévu. Tout dépôt est remboursable sans pénalité si une personne annule sa réservation avant 16 h la date d'arrivée. Autrement, le dépôt en entier ne sera pas remboursé. Si une personne ne se présente pas à l'hôtel, on lui facturera la première nuit de sa réservation.

Services de garde

Des renseignements sur les services de garde seront fournis par les hôtels prévus pour la Réunion. On vous recommande de faire vos démarches et vos réservations à l'avance.

Au Pan Pacific, veuillez contacter le Concierge pour une liste de recommandations. Pour le Ramada, il y a aucun service disponible présentement.

Nous publierons tout nouveau renseignement sur le site Web dès que nous le recevrons.

Stationnement

Au PanPacific : 2 \$ la demi-heure, max. : 12 \$ / jour, 18 \$ / nuit, service voiturier aussi offert (27 \$ / jour - entrées et sorties permises). Au Ramada : service voiturier seulement (15 \$ / nuit - entrées et sorties permises)

Déplacements

Ville de Vancouver: Vous trouverez des renseignements détaillés sur la ville de Vancouver (renseignements touristiques, température et climat locaux, navette à provenance et en destination de l'aéroport, cartes de la ville et des attractions touristiques, etc.) sur le site Web suivant : www.tourismvancouver.com

Remerciements

Nous remercions les organismes suivants de leur soutien financier :

le Comité du programme national (programme conjoint du Centre de recherches mathématique, de l'Institut Fields et de l'Institut Pacific)

l'Université Simon Fraser
l'Université de la Colombie-Britannique
l'Université de Calgary
l'Université de la Colombie-Britannique Nord

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

Comité de coordination

Programme, Président et coordinateur

Norman Reilly (Simon Fraser)

Kai Behrend (UBC)	Michael Bennett (UBC)
Len Berggren (SFU)	Peter Borwein (SFU)
David Boyd (UBC)	Imin Chen (SFU)
Stephen Choi (SFU)	Rustum Choksi (SFU)
Florin Diacu (Victoria)	Vlastimil Dlab (Carleton)
Malgorzata Dubiel (SFU)	Luis Goddyn (SFU)
Jennifer Hyndman (UNBC)	
Leah Keshet (UBC)	Izabella Lala (UBC)
Alex Iosevich (Missouri-Columbia)	Petr Lisonek (SFU)
Shiping Liu (Sherbrooke)	Michael Monagan (SFU)
David Muraki (SFU)	Keith Promislow (SFU)
Ian Putnam (Victoria)	Steven Ruuth (Simon Fraser)
Ladislav Stacho (SFU)	Brett Stevens (Carleton)
Douglas R. Stinson (Waterloo)	Marcelo Laca (Victoria)
Graham Wright (SMC, d'office)	

Logistique

Président du comité local: Malgorzata Dubiel (SFU)
Monique Bouchard (SMC, d'office)



photos Greg Ehlers

CMS WINTER MEETING 2003 – DECEMBER 6 - 8

**Simon Fraser University – Harbour Centre Campus
515 West Hastings Street
Vancouver, British Columbia**

On behalf of Simon Fraser University, the Department of Mathematics invites all researchers, educators and students to the Winter 2003 Meeting of the Canadian Mathematical Society (CMS).

The members of the Department are looking forward to welcoming their colleagues back to its Harbour Centre Campus, in the heart of one of Canada's most beautiful and exciting cities.

Following the usual format, the meeting will include a wide variety of symposia, a session of contributed papers, at least six plenary speakers, a short course on Cryptography as well as the CMS Coxeter-James and Doctoral Prize lecturers.

Most activities and all scientific talks will be held at the Harbour Centre campus of the University, 515 West Hastings Street, Vancouver, British Columbia. Some pre-meeting activities, the Delegates' Luncheon and the meeting banquet will be held at the Pan Pacific Hotel, 300-999 Canada Place.

The most up-to-date information concerning the programmes, including detailed schedules, will be made available at the following web site: <http://cms.math.ca/Events/winter03/> Meeting registration forms and hotel accommodation forms will be published in the September 2003 issue of the CMS Notes and are also available on the web site, along with on-line forms for registration and submission of abstracts.

Plenary Speakers

Tom Archibald (Acadia University), Deborah Ball (Michigan) and Hyman Bass (Michigan), Robert Calderbank (AT&T Laboratories, NJ), Andrew Granville (University of Montreal), Madhu Sudan (MIT).

Prizes and Awards

The CMS Coxeter-James Lecture will be given by Jingyi Chen, University of British Columbia. The CMS Doctoral Prize Lecture will be given by Alina Carmen Cojocaru, Queen's University.

Symposia

By invitation of the Meeting Committee, there will be symposia in the following areas. Here is the preliminary list of speakers. If you are interested in being an invited speaker in one of the symposia, it may be possible to do so

by contacting one of the organizers of that symposium.

Combinatorics

Org: Petr Lisonek (Simon Fraser) and Brett Stevens (Carleton)

Richard Anstee (UBC), Francois Bergeron (UQAM), Nantel Bergeron (York), Dalibor Froncek (Minnesota), Jonathan Jedwab (Simon Fraser), Marni Mishna (UQAM), Frank Ruskey (Victoria), Nabil Shalaby (Memorial), John van Rees (Manitoba), Timothy Walsh (UQAM), David Wehlau (Queen's), Julian West (Malaspina).

Computer Algebra

Org: Michael Monagan (Simon Fraser)

Dynamical Systems, Celestial Mechanics

Org: Florin Diacu (Victoria)

Larry Bates (Calgary), Jacques Belair (Montreal), Wu Jianhong (York), Tomasz Kaczynski (Sherbrooke), Bill Langford (Guelph), Angelo Mingarelli (Carleton), Richard Montgomery (California-Santa Cruz), Dan Offin (Queens), Juan-Pablo Ortega (CNRS, Nice, France), George Patrick (Saskatchewan), Ernesto Perez-Chavela (UAM, Mexico City), Mark Roberts (Surrey), Christiane Rousseau (Montreal), Manuele Santoprete (California-Irvine), Dana Schlomiuk (Montreal), Tanya Schmah (Warwick), Cristina Stoica (Surrey), Andre Vanderbauwhede (Gent), Gail Wolkowicz (McMaster).

Education

Org: Malgorzata Dubiel (Simon Fraser)

Graphs and Matroids

Org: Luis Goddyn (Simon Fraser) and Ladislav Stacho (Simon Fraser).

Kathie Cameron (Waterloo), Penny Haxell (Waterloo), Peter Horak (Washington), Jing Huang (Victoria), Sandra Kingan (Pennsylvania State), Gary McGillivray (Victoria), Sean McGuinness (Adelphi), Jenny McNulty (Montana), Wendy Myrvold (Victoria), Nancy Neudauer (Pacific), Ortrud Oellermann (Winnipeg), Bruce Reed (McGill), Bing Zhou (Trent).

Harmonic Analysis

Org: Izabella Laba (UBC) and Alex Iosevich (Missouri-Columbia).

Michael Christ (California-Berkeley), James Colliander (Toronto), Walter Craig (McMaster), Galia Dafni

(Concordia), Andrea Fraser (Dalhousie), Steve Hofmann (Missouri-Columbia), Victor Ivrii (Toronto), Krop, Elliot (Washington), Michael Lacey (Georgia Tech), Camil Muscalu (UCLA), Malabika Pramanik (Wisconsin-Madison), Eric Sawyer (McMaster), Andreas Seeger (Wisconsin-Madison), Gigliola Stafillani (MIT), Daniel Tataru (California-Berkeley), Gunther Uhlmann (Washington), Steve Wainger (Wisconsin-Madison).

History of Mathematics

Org: Len Berggren (Simon Fraser)

Tom Archibald (Acadia), J.L. Berggren (Simon Fraser), Lawrence D'Antonio (Ramapo College of New Jersey), Hardy Grant (York), Alexander Jones (Toronto), Israel Kleiner (York), Gregory Moore (McMaster), Nathan Sidoli (Toronto), Glen Van Brummelen (Bennington College).

Mathematical Biology

Org: Leah Keshet (UBC)

Jacques Belair (Montreal), Fred Brauer (UBC), Roderick Edwards (Victoria), Pauline van den Driessche (Victoria).

Models for Atmospheric Fluid Dynamics

Org: David Muraki (Simon Fraser)

Nonlinear Partial Differential Equations

Org: Rustum Choksi (Simon Fraser) and Keith Promislow (Simon Fraser)

Stephen Gustafson (UBC), Robert Jerrard (Toronto), Nathan Kutz (Washington), Giovanni Leoni (Carnegie Mellon), Yi A. Li (Steven's Institute of Technology), Govind Menon (Wisconsin), Bob Pego (Maryland), Dmitry Pelinovski (McMaster), Arnd Scheel (Minnesota), Daniel Spirm (Brown).

Number Theory

Org: Michael Bennett (UBC), Peter Borwein (Simon Fraser), David Boyd (UBC), Imin Chen (Simon Fraser), and Stephen Choi (Simon Fraser)

Amir Akbary (Lethbridge), Chantal David (Concordia), Karl Dilcher (Dalhousie), John Friedlander (Toronto), Ben Green (PIMS), Hershy Kisilevsky (Concordia), Claude Levesque (Laval), Frederich Littmann (PIMS), David McKinnon (Waterloo), Nathan Ng (Montreal), Robert Osburn (McMaster), Christopher Rowe (PIMS), Damien Roy (Ottawa), Cam Stewart (Waterloo), Hugh Williams (Calgary).

Operator Algebras

Org: Marcelo Laca (Victoria) and Ian Putnam (Victoria)

Berndt Brenken (Calgary), Ken Davidson (Waterloo), Thierry Giordano (Ottawa), David Kerr (Rome), Mahmood Khoshkam (Saskatchewan), Michael Lamoureux (Calgary), Qing Lin (Selkirk College), Jamie Mingo (Queen's), Andu Nica (Waterloo), Igor Nikolaev (Calgary),

Vladimir Pestov (Ottawa), John Phillips (Victoria), N.C. Phillips (Oregon), Jack Spielberg (Arizona State), Keith Taylor (Saskatchewan), Sam Walters (Northern British Columbia).

Quantum Cohomology and Mirror Symmetry

Org: Kai Behrend (UBC)

Jim Bryan (UBC), Ionut Ciocan-Fontanine (Minnesota), Alastair Craw (Utah), Chuck Doran (Washington), Barbara Fantechi (SISSA), Holger Kley (Colorado), Sandor Kovac (Washington), Ravi Vakil (Stanford).

Representations of Associative Algebras and Related Topics

Org: Vlastimil Dlab (Carleton) and Shiping Liu (Sherbrooke)

Raymundo Bautista (UNAM, Morelia), Frauke Bleher (Ohio), Thomas Bruestle (Bielefeld), Ragnar Buchweitz (Toronto), Xueqing Chen (Ottawa), Andrew Dean (Nipissing), Harm Derksen (Michigan), Kent Fuller (Iowa), Christof Geiss (UNAM), Ron Gentle (EWU), Ellen Kirkman (Wake Forest), Size Li (Beijing Normal), Shiping Liu (Sherbrooke), Frank Marko (Pennsylvania State-Hazleton), Alex Martsinkovsky (Northeastern), Markus Schmidmeier (Florida), Paul Smith (Washington), Dan Zacharia (Syracuse), Rita Zuazua (UNAM, Morelia).

Universal Algebra and Lattice Theory

Org: Jennifer Hyndman (UNBC)

Erin Beveridge (Northern British Columbia), Stan Burris (Waterloo), David Casperson (Northern British Columbia), Dejan Delic (Ryerson), Ewa Graczyńska (Technical Univ of Opole), George Gratzer (Manitoba), Benoit Larose (Concordia), Ralph McKenzie (Vanderbilt), Michael Roddy (Brandon), Boza Tasic (Waterloo), Matt Valeriote (McMaster), Ross Willard (Waterloo), Shelly Wismath (Lethbridge).

Contributed Papers Session

(Org: Steven Ruuth, Simon Fraser University)

Contributed papers of 15 minutes duration are invited. Abstracts for CMS contributed papers should be prepared as specified below. For an abstract to be eligible, the abstract must be received before October 15, 2003. The abstract must be accompanied by its contributor's registration form and payment of the appropriate fees.

To better assist organizers, please include the Primary (2000) AMS Classification (<http://www.ams.org/msc/>).

Short course on Cryptography

Space in the Short Course is restricted. Priority will be given to those paying the Short Course Fee (\$150). Other persons registering for the Meeting as a whole may apply for

admission to the Short Course and admission tickets will be given on a first-come, first-served basis as space permits.

Doug Stinson (Waterloo)
Introduction to Cryptography

Neal Koblitz (Washington)
Elliptic Curve Cryptography

Hugh Williams (Calgary)
Algorithmic Number Theory

Mike Mosca (Waterloo)
Quantum Computing and Quantum Cryptography

Travel Grants for Graduate Students

Limited funds are available to partially fund the travel and accommodation costs for graduate students. For more information, please contact the Meeting Committee at gradtravel-w03@cms.math.ca.

Applicants must be bona fide graduate students, at a Canadian or other University. To apply for this funding, please have a letter written by your Supervisor or departmental Graduate Advisor, briefly answering the following: Name of Student, Area of study and level, How will the student benefit from the meeting? Will the student be speaking? What support is available from local sources or grants, for this student?

Please have this sent before November 1, 2003. This letter may be emailed to gradtravel-w03@cms.math.ca. Applicants will be notified early in November of the funding decision.

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

Social Events

A welcoming reception will be held Friday, December 5, from 7:00 to 9:00 p.m. in the Cypress Suite of the Pan Pacific Hotel.

The Delegates' Luncheon will be held on Saturday, December 6, from 12:00 to 2:00 p.m. in the Governor General Suite of the Pan Pacific Hotel. A ticket to this luncheon is included in all registration fee categories.

A banquet will be held on Sunday, December 7, from 7:00 p.m. in the Crystal Pavilion of the Pan Pacific Hotel, preceded by a cash bar at 6:00 p.m. Tickets to this event are available at \$60.00 each.

Coffee and juice will be available during the scheduled breaks.

A block of tickets has been reserved for a Carol Ship Cruise Dinner. Tickets include a four hour cruise on the Pride of

Vancouver, joining the annual flotilla of carol ships. We'll cruise the inlet while dining, caroling (and dancing!). This is a wonderful way to savour the scenery and celebrate the season. The cruise features a gourmet buffet, live entertainment, and Christmas carols. Tickets are available for \$70 each.

A detailed schedule of all social and other events is available from the schedule page of the meeting web site.

Business Meetings

The CMS will be holding business meetings during the course of the meeting.

The CMS Executive Committee Meeting will meet on Thursday, December 4, from 6:00 to 10:00 p.m. in the Governor General Suite A of the Pan Pacific Hotel.

The CMS Development Group Luncheon will be held from 11:00 a.m. to 1:00 p.m. on Friday, December 5 in the Canada Suite of the Pan Pacific Hotel.

The CMS Board of Directors Meeting will be held from 1:30 to 6:30 p.m. on Friday, December 5 in the Governor General Suite A+B of the Pan Pacific Hotel.

A detailed schedule of business meetings and other events is available from the schedule page of the meeting web site.

Exhibits

Exhibits: Exhibits will be open during specified hours in the Segal Center of the Simon Fraser University's Harbour Center. The CMS exhibit will be open throughout the course of the meeting.

Submission of Abstracts

Abstracts for all talks will be published in the meeting programme and will also be available on-line.

Abstracts may be sent electronically, following instructions given below. Electronic submission of abstracts is preferred. If this is not possible, abstracts may also be prepared on the standard form available from the CMS Executive Office, 577 King Edward, Suite 109, Ottawa, Ontario CANADA K1N 6N5.

Speakers are asked to submit their abstracts as soon as possible. The deadline for submission of abstracts has been set at October 15, 2003. The organizers appreciate the cooperation of all the speakers in observing this important deadline.

Electronic submission of abstracts: To submit your abstract, please go to the forms section of the meeting web site.

Alternatively, files including the session, speaker's name, affiliation, complete address, title of talk, and abstracts may be sent to abstracts-w03@cms.math.ca (speakers), or cp-abstracts-w03@cms.math.ca (contributed papers).

Please make sure to include the session name in your subject line. For contributed papers, to better assist organizers, please include the 2000 AMS Subject Classification (<http://www.ams.org/msc/>).

Important deadline for submission of all abstracts: October 15, 2003.

Registration

The registration form is also available from:

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
meetings@cms.math.ca

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 IN OTTAWA on or before November 1 in order to qualify for reduced rates. In order for your payment to be processed before the meeting, it should be received by November 28.

Why Preregister?

Wondering whether to pre-register or wait until you arrive? Here are some advantages to pre-registering.

- many can take advantage of reduced fees until the early registration deadline (see above)
- your name would appear on the list of participants on our web site
- your Meeting Kit will be waiting for you at the reception on Friday evening
- no waiting in line early Saturday morning to process your registration!
- banquet tickets are available now but may no longer be available on site

For all these reasons, we encourage you to preregister, whether it be before or after the early registration deadline. If you'd like to preregister and enjoy the above benefits, please visit our web site to use our online forms.

Refund Policy

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

	Before Nov. 1	After Nov. 1
Delegate's Luncheon included		
Plenary speakers (1 free banquet ticket)	\$0	\$0
Prize lecturers (2 free banquet tickets)	\$0	\$0
Mini-course lecturers	\$0	\$0
Session speakers	\$225	\$225
Organizers	\$150	\$150
Non-members	\$450	\$585
CMS/AMS/MAA members with grants	\$300	\$390
CMS/AMS/MAA members without grants	\$150	\$195
One-day fee	\$200	\$260
Postdocs, retired	\$115	\$150
Teachers (K-12, CEGEP), students, unemployed	\$60	\$80
Short Course on Cryptography ONLY	\$150	\$150
Banquet (Sunday, Dec 7, Pan Pacific)	\$60	\$60
Carol Ship Dinner Cruise (Sat, Dec 6)	\$70	\$70

N.B. L'inscription pour le mini-cours est limité.

SMC = Société mathématique du Canada

AMS = American Mathematical Society

MAA = Mathematical Association of America

Do you qualify for free CMS membership?

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

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

Accommodation

It is recommended that those attending the conference book early to avoid disappointment. Blocks of rooms have been reserved at the locations given below and will be held until the deadlines specified. Reservations not made by that date will be on a space available basis at regular published rates.

Rates are per room, per night and are quoted in Canadian dollars. In all cases, all reservations must be guaranteed by a first night deposit, or major credit card guarantee.

The conference rate is usually extended up to two days pre- and post-convention. When making your reservation, PLEASE QUOTE THE GROUP CODE.

In the event that your preferred hotel is not available, please contact your second choice.

The Pan Pacific Vancouver

300 - 999 Canada Place

Vancouver (British Columbia) Canada V6C 3B5

Points: see <http://www.panpacific.com/partners/index.html>

Check-in: 3:00 p.m.; Check-out: 12:00 noon

Applicable taxes: GST (7%), Hotel tax (10%)

Deadline: November 3, 2003

Group Code: Canadian Mathematical Society

Hotel phone: 604-662-8111

Toll-free: 1-800-663-1515 (Canada) 1-800-937-1515 (USA)

FAX: 604-895-2469

email: reservations@panpacific-hotel.com

parking: \$2 per 1/2 hr, max \$12 daily, \$18 for overnight

Valet parking also available

(\$27 daily with in-out privileges)

Rates

\$125, Superior, single/double occupancy

\$155, Superior, triple occupancy

\$185, Superior, quadruple occupancy

\$135, Deluxe, single/double occupancy

\$165, Deluxe, triple occupancy

\$195, Deluxe, quadruple occupancy

(Children 18 yrs old and under sharing parents' accommodation are complimentary.)

Ramada Limited Downtown Vancouver

435 West Pender Street

Vancouver (British Columbia) Canada V6B 1V2

Points: Aeroplan, Petro Points, Club Ramada

Check-in: 3:00 p.m.; Check-out: 12:00 noon

Applicable taxes: GST (7%), Hotel tax (10%)

Deadline: November 3, 2003

Group Code: 1030

Phone: 604-488-1088 Toll-free: 1-888-389-5888

FAX: 604-488-1090

email: reservations@telus.net

parking: Valet parking only (\$15 per night) with in/out privileges

complimentary deluxe continental breakfast

complimentary hi-speed wireless internet service available

handicapped rooms available

Rates

\$75, single/double occupancy

\$90, triple occupancy

\$105, quadruple occupancy

(Children 17 yrs old and under sharing parents' accommodation are complimentary.)

Cancellations

For the Pan Pacific Hotel, reservations will be held until 6:00 p.m. on the day of arrival. In the case of a «no show» or if a guaranteed reservation is not cancelled by 12:00 midnight on the day prior to the expected day of arrival, the cost of the room for the first night will be charged to the guarantor. NOTE: At the time of check-in on the day of arrival, all guests will be asked to verify their departure date. At that time, any necessary changes can be made without penalty. If the guest chooses to depart prior to this date, they will be assessed a fee of \$100.00 against their credit card.

For the Ramada Limited Downtown Vancouver, reservations will be held until 6:00 p.m. on the day of arrival. In the case of a “no show” or if a guaranteed reservation is not cancelled by 4:00 p.m. on the day prior to the expected day of arrival, the cost of the room for the first night will be charged to the guarantor.

Child Care

Information regarding available child care may be provided by the meeting hotels. Advance research and arrangements are recommended.

For the Pan Pacific, the Concierge can provide a list of bonded child care professionals. For the Ramada, there are no facilities for child care presently available.

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

Travel

The City of Vancouver: Detailed information regarding the City of Vancouver, including Tourism Information, local weather and climate, airport shuttle information, site and street maps are available at the website:

www.tourismvancouver.com

Parking

At the Pan Pacific, parking is available at \$2 per 1/2 hr, max \$12 daily, \$18 for overnight. Valet parking is also available (\$27 daily with in-out privileges). At the Ramada Limited Downtown Vancouver, there is valet parking only (\$15 per night) with in/out privileges.

Acknowledgements

Support from the following is gratefully acknowledged:
 The National Programme Committee (a joint funding body of the Centre de recherches math matiques, The Fields Institute for Research in Mathematical Sciences, and The Pacific Institute for the Mathematical Sciences)

Simon Fraser University

University of British Columbia

University of Calgary

University of Northern British Columbia

The Canadian Mathematical Society would like to acknowledge the contribution of the members of the Meeting Committee for organizing this meeting.

Meeting Committee

Programme Meeting Director

Norman Reilly (Simon Fraser)

- | | |
|-----------------------------------|-------------------------------|
| Kai Behrend (UBC) | Michael Bennett (UBC) |
| Len Berggren (SFU) | Peter Borwein (SFU) |
| David Boyd (UBC) | Imin Chen (SFU) |
| Stephen Choi (SFU) | Rustum Choksi (SFU) |
| Florin Diacu (Victoria) | Vlastimil Dlab (Carleton) |
| Malgorzata Dubiel (SFU) | Luis Goddyn (SFU) |
| Jennifer Hyndman (UNBC) | |
| Leah Keshet (UBC) | Izabella Lala (UBC) |
| Marcelo Laca (Victoria) | Shiping Liu (Sherbrooke) |
| Alex Iosevich (Missouri-Columbia) | Petr Lisonek (SFU) |
| Michael Monagan (SFU) | David Muraki (SFU) |
| Keith Promislow (SFU) | Ian Putnam (Victoria) |
| Steven Ruuth (Simon Fraser) | Ladislav Stacho (SFU) |
| Brett Stevens (Carleton) | Douglas R. Stinson (Waterloo) |
| Graham Wright (CMS ex-officio). | |

Local Arrangements

Chair: Malgorzata Dubiel (Simon Fraser)

Monique Bouchard (CMS ex-officio).



photos Greg Ehlers

**SOCIÉTÉ MATHÉMATIQUE DU CANADA
FORMULAIRE D'INSCRIPTION – HIVER 2003**

Décembre 2003 – Université Simon Fraser Harbour Centre, Vancouver, Colombie-Britannique
Vous pouvez aussi vous inscrire sur le Web au <http://www.smc.math.ca/Reunion/hiver03/forms.html>

Dates importantes:		Pré-inscription à prix réduit	paiement avant le 1er novembre
		Arrivée de paiement pour traiter l'inscription avant la Réunion	28 novembre
		Annulation – Pré-inscription (remboursement moins 40 \$)	28 novembre
NOM:	PRÉNOM:	No. SMC	
Établissement (pour le "badge"):			
Adresse postale:		Information optionnelle:	
<input type="checkbox"/> domicile OU		<input type="checkbox"/> Homme	
<input type="checkbox"/> travail		<input type="checkbox"/> Femme	
Téléphone:		Courriel:	
Date d'arrivée:		Date de départ:	
VOUS ÊTES PRIÉS DE FAIRE VOS PROPRES RÉSERVATIONS D'HÔTEL. DATE LIMITE: 3 novembre			
Votre choix d'hôtel? <input type="checkbox"/> The PanPacific Hotel <input type="checkbox"/> Ramada Limited Downtown Vancouver			
<input type="checkbox"/> Autre hôtel <input type="checkbox"/> Aucune réservation nécessaire			
<input type="checkbox"/> Kosher <input type="checkbox"/> Végétarien <input type="checkbox"/> Diabétique <input type="checkbox"/> Pauvre en mat. grasses <input type="checkbox"/> Allergie-lait <input type="checkbox"/> Allergie-noix <input type="checkbox"/> Autre:			
Je suis un: <input type="checkbox"/> organisateur <input type="checkbox"/> conférencier primé <input type="checkbox"/> conf. principal <input type="checkbox"/> conf. de séance <input type="checkbox"/> participant			
DATE LIMITE – CONFÉRENCIER PRIMÉ/ PRINCIPAL/ DE SÉANCE (RÉSUMÉ) : 15 OCTOBRE			
<input type="checkbox"/> J'aimerais présenter une communication libre.			
DATE LIMITE – COMMUNICATIONS LIBRES (RÉSUMÉ ET INSCRIPTION) : 15 OCTOBRE			
Le résumé sera évalué une fois que les frais d'inscription seront reçus.			
PAGE WEB POUR ENVOI DE RÉSUMÉS: http://www.smc.math.ca/Reunions/hiver03/forms.html			
Adhésions: <input type="checkbox"/> SMC <input type="checkbox"/> SCMAI <input type="checkbox"/> SCRO <input type="checkbox"/> SCHPM <input type="checkbox"/> SSC <input type="checkbox"/> NCTM <input type="checkbox"/> AMS <input type="checkbox"/> MAA <input type="checkbox"/> SIAM <input type="checkbox"/> AWM			
<input type="checkbox"/> CCEDM <input type="checkbox"/> Assoc. provincial (préciser): <input type="checkbox"/> Comm. Scolaire (préciser): <input type="checkbox"/> Autre org. (préciser):			
<input type="checkbox"/> Prof. d'univ. <input type="checkbox"/> Enseignant-élém. <input type="checkbox"/> Enseignant-inter. <input type="checkbox"/> Enseignant-sec. <input type="checkbox"/> Enseignant-collège			
<input type="checkbox"/> Enseignant-Cégep <input type="checkbox"/> Étudiant <input type="checkbox"/> Postdoc <input type="checkbox"/> Secteur public <input type="checkbox"/> Secteur privé <input type="checkbox"/> Autre (préciser):			
VEUILLEZ INDIQUER À QUEL(S) ÉVÉNEMENT(S) VOUS PARTICIPEZ			
<input type="checkbox"/> Réunion de la SMC ET Mini-cours - Cryptologie <input type="checkbox"/> Mini-cours – Cryptologie SEULEMENT			
VEUILLEZ INDIQUER À QUELLE(S) SÉANCE(S) VOUS PARTICIPEZ			
<input type="checkbox"/> Combinatoire	<input type="checkbox"/> Algèbre computationnelle		
<input type="checkbox"/> Systèmes dynamiques, Mécanique céleste	<input type="checkbox"/> Enseignement des mathématiques		
<input type="checkbox"/> Graphes et matroïdes	<input type="checkbox"/> Analyse harmonique		
<input type="checkbox"/> Histoire des mathématiques	<input type="checkbox"/> Biologie mathématique		
<input type="checkbox"/> Modèles pour la dynamique des fluides atmosphériques	<input type="checkbox"/> Équations aux dérivées partielles non linéaires		
<input type="checkbox"/> Théorie des nombres	<input type="checkbox"/> Algèbres d'opérateurs		
<input type="checkbox"/> Cohomologie quantique et symétrie miroir	<input type="checkbox"/> Représentations d'algèbres associatives et sujets connexes		
<input type="checkbox"/> Algèbre universelle et théorie des treillis	<input type="checkbox"/> Autre:		

Accès au mini-cours – Cryptologie et un billet pour le lunch des délégués sont inclus dans toutes les catégories d'inscription.

Si vous vous trouvez dans plus d'une catégorie, choisissez le montant moins élevé.

Veillez encercler la catégorie d'inscription choisie	Avant le 1er novembre	Après le 1er novembre
Confé. principaux (1 billet banquet gratuit)/ conf. primés (2 billets banquet gratuits)	\$ 0	\$ 0
Conférenciers mini-cours	\$ 0	\$ 0
Conférenciers	225	225
Organisateurs	150	150
Non-membres	450	585
Membres SMC/AMS/MAA avec subvention	300	390
Membres SMC/AMS/MAA sans subvention	150	195
Frais d'une journée	200	260
Postdocs, retraités	115	150
Enseignant (élém., second., Cégep), étudiants, sans-emploi	60	80
MINI-COURS: "CRYPTOLOGIE" SEULEMENT	150	150
Banquet (dimanche le 7 décembre, Pan Pacific) – QUANTITÉ LIMITÉ	60	60
Croisière (samedi le 6 décembre) – QUANTITÉ LIMITÉ	70	70

Inscription:	\$	#	Banquet =	\$	#	Croisière =	\$	TOTAL	\$
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									
Carte de crédit #:					Date d'expiration:				
Veillez inscrire votre nom (tel qu'il apparaît sur votre carte) en lettres moulées et signer.									
Si vous utilisez la carte d'une autre personne, veuillez inscrire le nom du détenteur et le faire signer.)									
Lettres moulées:					Signature:				

Veillez envoyer ce formulaire et votre paiement à:

Bureau de la SMC, 577, av. King-Edward, C.P. 450, Succursale A, Ottawa, (Ontario) CANADA K1N 6N5
Téléphone: (613) 562-5702 Télécopieur: (613) 565-1539 (À utiliser pour paiements par carte de crédit seulement.)

**CANADIAN MATHEMATICAL SOCIETY
REGISTRATION FORM – CMS WINTER MEETING 2003
December 6-8, 2003 – Simon Fraser University Harbour Centre, Vancouver, British Columbia**
To register electronically, go to <http://www.cms.math.ca/Events/winter03/forms.html>

Deadlines:	Preregistration for reduced rates	payment by November 1
	Arrival of payments to be processed before the meeting	November 28
	Cancellation (refund less \$40 penalty)	November 28

LASTNAME:	FIRST NAME	CMS ID #
Institution (for badge):		
Mailing Address:	Voluntary Information	
<input type="checkbox"/> home OR	<input type="checkbox"/> Male	
<input type="checkbox"/> office	<input type="checkbox"/> Female	
Telephone:	Email:	
Arrival date:	Departure date:	
PLEASE MAKE YOUR HOTEL RESERVATIONS. DEADLINE: November 3		
Where will you be staying?	<input type="checkbox"/> The PanPacific Hotel	<input type="checkbox"/> Ramada Limited Downtown Vancouver
	<input type="checkbox"/> Other hotel	<input type="checkbox"/> No housing required
Special diets: <input type="checkbox"/> Kosher <input type="checkbox"/> Vegetarian <input type="checkbox"/> Diabetic <input type="checkbox"/> Low fat <input type="checkbox"/> Milk allergy <input type="checkbox"/> Nut allergy <input type="checkbox"/> Other:		
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"/> none of the above		
SPEAKER SESSION:		ABSTRACT DEADLINE: OCTOBER 15
<input type="checkbox"/> I would like to deliver a contributed paper.		
CONTRIBUTED PAPER DEADLINE (ABSTRACT & REGISTRATION) : OCTOBER 15		
Please remember, we cannot consider the contributed paper abstracts until registration fees are received.		
TO SUBMIT YOUR ABSTRACT, GO TO http:// www.cms.math.ca/Events/winter03/forms.html		
Member of: <input type="checkbox"/> CMS <input type="checkbox"/> CAIMS <input type="checkbox"/> CORS <input type="checkbox"/> CSHPM <input type="checkbox"/> SSC <input type="checkbox"/> NCTM <input type="checkbox"/> AMS <input type="checkbox"/> MAA <input type="checkbox"/> SIAM <input type="checkbox"/> AWM		
<input type="checkbox"/> CMESG <input type="checkbox"/> Provincial Ass'n (specify): <input type="checkbox"/> School board (specify): <input type="checkbox"/> Other org'n (specify):		
<input type="checkbox"/> University Professor <input type="checkbox"/> Elementary teacher <input type="checkbox"/> Middle School teacher <input type="checkbox"/> High School teacher <input type="checkbox"/> College teacher		
<input type="checkbox"/> CEGEP teacher <input type="checkbox"/> Student <input type="checkbox"/> Postdoc <input type="checkbox"/> Public sector <input type="checkbox"/> Private sector <input type="checkbox"/> Other (specify):		
PLEASE INDICATE WHICH SPECIAL OR RELATED EVENT(S) YOU MIGHT BE ATTENDING		
<input type="checkbox"/> CMS Meeting AND Short-course on Cryptography <input type="checkbox"/> Short-course on Cryptography ONLY		
PLEASE INDICATE WHICH SESSION(S) YOU MIGHT BE ATTENDING		
<input type="checkbox"/> Combinatorics	<input type="checkbox"/> Computer Algebra	
<input type="checkbox"/> Dynamical Systems, Celestial Mechanics	<input type="checkbox"/> Mathematical Education	
<input type="checkbox"/> Graphs and Matroids	<input type="checkbox"/> Harmonic analysis	
<input type="checkbox"/> History of Mathematics	<input type="checkbox"/> Mathematical Biology	
<input type="checkbox"/> Models for Atmospheric Fluid Dynamics	<input type="checkbox"/> Nonlinear Partial Differential Equations	
<input type="checkbox"/> Number Theory	<input type="checkbox"/> Operator Algebras	
<input type="checkbox"/> Quantum Cohomology and Mirror Symmetry	<input type="checkbox"/> Representations of Associative Algebras and Related Topics	
<input type="checkbox"/> Universal Algebra and Lattice Theory	<input type="checkbox"/> Others:	

All categories include a ticket to the Delegates' Luncheon and access to the Short Course on Cryptography.
Should you fit into more than one fee category, choose whichever is less.

Please circle one of the registration categories in the chart below	Before November 1	After November 1
Plenary Speaker (1 free banquet ticket), Prize lecturers (2 free banquet tickets)	\$ 0	\$ 0
Mini-course lecturers	\$ 0	\$ 0
Session Speakers	225	225
Organizers	150	150
Non-members	450	585
CMS/AMS/MAA members with grants	300	390
CMS/AMS/MAA members without grants	150	195
One-day fee	200	260
Postdocs, retired	115	150
Teachers (K-12, CEGEP), students, unemployed	60	80
SHORT COURSE ON CRYPTOGRAPHY ONLY	150	150
Banquet (Sunday, December 7, Pan Pacific) - LIMITED QUANTITY	60	60
Carol Ship Dinner Cruise (Saturday, December 6) – LIMITED QUANTITY	70	70

Registration: \$	#	Banquet = \$	#	Dinner Cruise = \$	TOTAL \$
Payment method: <input type="checkbox"/> Cheque (payable to CMS) <input type="checkbox"/> VISA <input type="checkbox"/> Master Card <input type="checkbox"/> 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 name on card:			Signature:		

Send completed form with payment to:
CMS Executive Office, 577 King Edward, POB 450, Station A, Ottawa, ON CANADA K1N 6N5
 Phone: 613-562-5702 FAX 613-565-1539 (Please use the FAX # for credit card payments only.)

CMS Winter 2003 – Réunion d'hiver 2003 de la SMC Simon Fraser University Harbour Centre - Université Simon Fraser Harbour Centre 515 West Hastings Street Vancouver, British Columbia -- Vancouver, Colombie-Britannique					
Time Heure	Thursday / jeudi December 4 décembre	Friday / vendredi December 5 décembre	Saturday / samedi December 6 décembre	Sunday / dimanche December 7 décembre	Monday / lundi December 8 décembre
8:00			8 am – 5 pm Exhibits / Expositions Registration / Inscription	8 am – 5 pm Exhibits / Expositions Registration / Inscription	8 am – 5 pm Registration / Inscription
8:30			Opening / Ouverture		
9:00			9:00 – 10:00 Robert Calderbank	8:30 – 10:30 SESSIONS	8:30 – 10:30 SESSIONS
10:00			<i>Coffee / Café</i>		
10:30				<i>Coffee / Café</i>	<i>Coffee / Café</i>
11:00			10:30 – 12:00 SESSIONS CRYPTOGRAPHY 10:15 – 11:15 Short Course 1 11:15 – 12:15 Short Course 2	11:00 – 12:00 Madhu Sudan	11:00 – 12:00 Tom Archibald
12:00		11:00 – 1:00 CMS Development Group Luncheon / Lunch du Groupe de développement SMC (Pan Pacific Hotel)	12:00 – 2:00 Delegates' Luncheon / Lunch des Participants (Pan Pacific Hotel)	12:00 – 1:30 Lunch	12:00 – 1:30 Lunch
1:30				1 :30 – 2 :30 Jingyi Chen CONFERENCIER COXETER-JAMES LECTURER	1 :30 – 2 :30 Alina Carmen Cojocar PRIX DOCTORAT DOCTORAL PRIZE
2:00			2:00 – 3:15 Deborah Ball Hyman Bass	<i>Coffee / Café</i>	<i>Coffee / Café</i>
2:30					
3:00					
3:15					
3:30		1:30 – 6:30 CMS Board of Directors Meeting / Réunion du Conseil d'administration de la SMC (Pan Pacific Hotel)	<i>Coffee / Café</i>		
4:00			3:30 – 6:30 SESSIONS CRYPTOGRAPHY 3:30 – 4:30 Short Course 3 4:30 – 5:30 Short Course 4	3:00 – 4:00 PLENARY	3:00 – 4:00 Andrew Granville
6:00				4:00 – 6:30 SESSIONS	4:00 – 6:30 SESSIONS
6:30	6:00 – 10:00 CMS Executive Committee Meeting / Réunion du Comité exécutif de la SMC (Pan Pacific Hotel)				
7:00		7 :00 – 9 :00 RECEPTION Meeting Registration / Inscription pour la réunion (Pan Pacific Hotel)	6:45 – 10:45 Carol Ship Dinner Cruise aboard the PRIDE OF VANCOUVER Boarding at 6:15 pm At Barberrry Coast Marina Tickets available at \$70	7:00 – 7:30 Cash – Bar RECEPTION Bar – Payant	
				7:30 – 10:30 BANQUET (Pan Pacific Hotel) Tickets available at \$60	

8/8/2003

CALL FOR NOMINATIONS / APPEL DE CANDIDATURES

Nominating Committee / Comité des mises en candidatures

The term of office of the Chair and two members of the Nominating Committee ends on December 31, 2003. The positions to be filled are as follows:

One vacancy: Chair

One vacancy: Representative for the Atlantic region

One vacancy: Representative for the Ontario region

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

The continuing members will be:

Line Baribeau (Laval) – Québec
 Claude Laflamme (Calgary) – West
 Eddy Campbell (Queen's) Ex-officio (President-Elect)
 Christiane Rousseau (Montréal) Ex-officio (President)

The deadline for submission of candidates is October 15, 2003. Names, together with the candidate's agreement to serve, should be sent to the address below.

Les mandats du président et pour deux membres du comité des mises en candidatures prennent fin le 31 décembre 2003. Les positions à combler sont les suivantes:

Une position : Président

Une position : Représentant pour la région de l'Atlantique

Une position : Représentant pour la région de l'Ontario

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

Les membres qui continueront sont :

Line Baribeau (Laval) – Québec
 Claude Laflamme (Calgary) – L'Ouest
 Eddy Campbell (Queen's) Ex-officio (Président-élu)
 Christiane Rousseau (Montréal) Ex-officio (Présidente)

L'échéance pour nommer des candidats est le 15 octobre 2003. Les noms, avec consentement du candidat, devraient être acheminés à l'adresse ci-dessous:

Dr. Graham Wright, Secretary / Secrétaire
Canadian Mathematical Society / Société mathématique du Canada
577 King Edward, Suite 109
P.O. Box 450 Station A / C.P. 450, Succursale A
Ottawa, Ontario K1N 6N5

PURE MATHEMATICS DEPARTMENT

Tenure-Track Position - University of Waterloo

The Department of Pure Mathematics at the University of Waterloo invites applications for one or more anticipated tenure-track positions starting July 1, 2004. The Department is particularly interested in candidates with research interests in algebra, geometry or topology, though outstanding candidates in all areas of Pure Mathematics will be considered.

In order to be considered a candidate must either have a Ph.D. or expect to complete the degree prior to the beginning of the appointment. Postdoctoral experience is preferred but not required. An appointment will be offered only to someone with very strong research and teaching qualifications. The closing date for receipt for applications is November 14, 2003. Applicants should submit their curriculum vitae, together with the names of at least three referees, and should arrange for letters of reference to be sent directly from the referees.

All qualified candidates are encouraged to apply; however Canadians and permanent residents will be given priority. The University of Waterloo encourages applications from all qualified individuals, including women, members of visible minorities, native people, and persons with disabilities. This appointment is subject to the availability of funds.

Please send applications to:
 Dr. F. Zorzitto, Chair
 Department of Pure Mathematics
 University of Waterloo
 Waterloo, Ontario, Canada N2L 3G1

The department's Web page is at http://math.uwaterloo.ca/PM_Dept/

FROM THE PRESIDENT'S DESK

Christiane Rousseau

We are now starting a new academic year. Before telling you more on the projects of the coming year let me report on the end of the academic year 2002-2003 during which were held two important events, namely the Canada School Mathematics Forum held in UQAM on May 16-18 and the CMS Summer Meeting, hosted by the University of Alberta, from June 14-16.

The CMS Summer meeting was a great success with nearly 400 participants. It has been another splendid opportunity to build and maintain friendships within the mathematical community, to celebrate our successes, and to enjoy the host city, in particular the parks along the North Saskatchewan River and the treasures of the Provincial Museum where the banquet was held.

Following our now usual format, the meeting included thirteen diverse symposia including one in Education, contributed papers, five plenary speakers, a public lecture, and two prize lectures. The Jeffery-Williams Lecture was given by Ram Murty (Queen's) who was the 1988 Coxeter-James Lecturer. The Krieger-Nelson Lecture was given by Leah Keshet (UBC). The five distinguished plenary speakers were Ingrid Daubechies (Princeton University), Roland Glowinski (University of Houston), Gerhard Huisken (Tuebingen/Albert Einstein Institute), James Lepowsky (Rutgers University), and Dennis Shasha (Courant Institute). The public lecture "An evening excursion to the zoo" was delivered by Robert Moody (University of Alberta). On behalf of all participants it is also my pleasure to thank all the organizers and sponsors of this meeting for their work and support.

For the first time the CMS Summer Meeting was preceded by the Conference "Connecting women in Mathematics across Canada" intended for Women Graduate Students in Canada organized jointly by the CMS Committee for women in mathematics and the Pacific Institute of Mathematical Sciences. The CMS Summer Meeting was also preceded by the second NExTMAC workshop ("New Experiences in Teaching Mathematics Across Canada"), intended for relatively new Mathematics/Statistics faculty and which aims to assist junior faculty to become better and more effective teachers. The meeting was followed by the Fourth Geoffrey J. Butler Memorial Conference on June 17-21 which was also held at the University of Alberta.

I am very pleased to announce the new CMS Excellence in Teaching Award supported by Nelson & Brooks/Cole in presence of Janet Piper from Nelson Thompson Learning. The prize was officially announced at the Banquet of the Edmonton Summer meeting and all delegates of the

meeting received posters of the event. The prize recognizes sustained and distinguished contributions at the level of post-secondary undergraduate teaching. The deadline of the first competition is November 15 and we hope to receive a lot of nominations, thus showing the importance of undergraduate teaching in many departments throughout the country.

On May 16-18 2003, 148 delegates attended the Canadian School Mathematics Forum, including school teachers, university faculty in mathematics and education, school board administrators, people working in provincial ministries, delegates for provincial associations of math teachers, a few delegates from industry, research councils and media. Pierre Reid, Minister of Education of Quebec and Honorary President of the Forum, introduced the public lecturer Jean-Marie de Koninck who spoke of "Le plaisir des mathématiques". The Forum has been an opportunity to compare issues and best practices across the country and to make links across the different levels of education and across the traditional provincial boundaries. Working groups have identified issues on which subgroups will prepare more detailed findings to be presented at the second meeting and some directions of actions. Proceedings will be published both electronically and will be distributed widely. In the name of all delegates of the Forum and of all those who think that mathematical education is an important issue in Canada I thank the members of the scientific committee and the local organizers, mainly Louis Charbonneau from UQAM, whose work has allowed the success of the event.

The plenary activities have covered a large spectrum of subjects. The lecture of Frederick Leung addressed the question why Asian students succeed so well and his study put forward the fact that Asian school teachers have a very strong training in mathematics. A panel then presented the situation in the different regions of the country highlighting at the same time the similitude between many problems in mathematical education in all regions of the country and the success of some special initiatives. The plenary lecture of Jean-Pierre Kahane illustrated how mathematical education in schools remains an essential to enable students to function and innovate in the modern world. Alan Bernardi from Bell presented in his plenary response the wide spectrum of activities of Bell which require a sophisticated mathematical treatment. Benoît Saint-Pierre, Directeur de l'ingénierie at Alcan, sent a written message to the participants on the importance of mathematical education.

A panel covered several goals and challenges in the modern school: enrichment (Ravi Vakil), mathematics education

for Aboriginal students (Corinne Jetté), teaching after the reform (André Deschênes), making math class interesting and improving numeracy (Kanwal Neel). Hyman Bass and Deborah Ball covered the theme of teacher education and development and how much math and skills elementary teachers must possess in order to properly teach mathematics. Panels on the last day addressed the question of going to the future.

The first panel “Going to the second Forum: how to increase the collaboration of mathematics educators across educational and across provincial boundaries” treated the following questions: “Should we consider a Canadian subcommission for ICMI?” (Bernard Hodgson), “How to have closer connections between universities and school teachers” (John Grant McLoughlin), “How teachers associations could decide to collaborate more closely” (Stewart Craven), “How the 95 Forum in Quebec has helped creating a dynamics in mathematical education in B.C. the following years” (Malgorzata Dubiel).

For the second panel “How to bring the ideas of the forum to the public; how to raise awareness of the importance of learning mathematics in schools” we heard the panelists:

Isabelle Blain, Vice-President, NSERC, Ivar Ekeland, Professor, UBC, Véronique Morin, Radio-Canada, President of Canadian Association of Science Writers Heather Sokoloff, The National Post.

The participants also split into 16 working groups covering a very wide spectrum of issues in mathematical education from elementary schools to preparation of students to enter science and engineering programs through mathematics for the active citizen and teaching mathematics to students of aboriginal communities.

The principal directions of work that have come out of the Forum are the following:

- Mathematical education for aboriginal students will become a major issue in this country in the next decades as these communities need to increase education to be able to create jobs in their territories. On the other hand the step is too high for aboriginal students in our schools if no effort is made to adapt to their culture and make school interesting to them.
- Elementary school teacher and development: we will work on guidelines in this direction.
- Maintaining the momentum of the Forum in continuing the dialogue with the provincial associations and with the ministries of education.
- The CMS is called to play a leadership role in mathematical education in the country at different levels: for instance in facilitating the dialogue between all partners in mathematical education in Canada

including the provincial associations and the ministries of education. With its industrial connections the CMS can bring the voice and needs of companies working in research and development. This leadership role will need to respect the provincial jurisdictions and the cultural differences.

- A lot of very good material is developed everywhere in the country: there is a need of networking good material, together with offering appropriate inservice teacher education.

The winners of the second competition for the NSERC-CMS Math in Moscow scholarship are Thomas Zamojski (McGill) and Kristin Shaw (UBC). They will spend the Fall term 2003 in the Moscow Independent University. Jonathan Kavanagh, the first winner of the NSERC-CMS Math in Moscow scholarship spent the Winter term 2003 in Moscow. His report tells us his experience.

The Annual General Meeting on June 15 in Edmonton accepted the Teller’s Report and I am extremely pleased to welcome the new members of the Executive Committee: Eddy Campbell (Queen’s) President-elect, Jon Thompson (UNB), Vice-president Atlantic, Steven Boyer (UQAM), Vice-president Quebec, Kathryn Hare (Waterloo), Vice-president Ontario and Samuel Chen, Vice-President West. It is also my pleasure to welcome the new Board members.

I want to extend my thanks to the outgoing members of the Executive Committee. Jonathan Borwein has finished a four-year term as President-elect, President and Past-president. During the last 4 years he has made enormous contributions to all aspects of the CMS activities. I am also grateful to the four outgoing Vice-Presidents who have all contributed actively to our activities: Edgar Goodaire (Memorial), Bernard Hodgson (Laval), James Mingo (Queen’s) and George Bluman (UBC).

Here is the first dossier of the new Executive for 2003-2004.

Task Force on “The future of CMS and its impact on the office” by Eddy Campbell and Christiane Rousseau

The Society has a long history of success, and has undertaken a vast number of initiatives in recent years. These include national forums on education, support for math camps, our extensive competitions programs. Our summer meetings routinely attract close to 400 delegates, and our winter meetings some 300 participants. For three years in a row we will organize three meetings a year: indeed, additional to our two meetings, we will have two Fora in 2003 and 2005 while we will meet in Toulouse in 2004. There are initiatives under way that would see us expand our publishing activities, either through expanding the number of publications or through offering our considerable expertise to societies and other organizations and their publications. There are may be opportunities to collaborate

more closely with other professional societies by sharing the expertise of our staff and other office resources. We are exploring the potential to become an umbrella organization or otherwise helping provincial mathematics teachers associations come together. These opportunities speak to our perceived successes in larger communities.

These activities and their potential for good have attracted considerable support both within our society and elsewhere. Generally speaking the management of the Society has been conservative, each venture being judged on its merits relative to our other activities, the costs estimated and the financial situation and prospects of the Society taken into account before new activities are approved. Regular reviews of existing activities are undertaken, committees are dropped or restructured, and office processes reorganized. In particular, as part of the 1999 strategic review of all CMS activities, our executive office was reviewed by the 1999 Task Force on Office Strategies, whose report is available at <http://www.cms.math.ca/Reports/>. Increasingly, however, we are discovering that we are rapidly approaching the limits

of what may be accomplished with our current staff complement and office space. Hence a new Task Force on “The future of CMS and its impact on the office” has been struck with a mandate to update the reports of the 1999 Task Forces 6 and 8: www.cms.math.ca/Projects/1998/tf6-report.html and www.cms.math.ca/Reports/-1998/tf8-report.html

We would most welcome any input of members of our community for where we should go. More specially:

1. If you are in favour of an increase of the level of activities of CMS we are particularly interested to know in which direction you wish an increase of the activities.
2. If you prefer that we stay with the same level of activities, then even staying with the same level of activities could imply a choice. Are you satisfied with the present activities of CMS or would you prefer that we withdraw from some old activities to concentrate on new ones?

A MESSAGE FROM THE BOARD OF DIRECTORS, PIMS

On behalf of the Board of Directors of the Pacific Institute for the Mathematical Sciences, I am happy to announce the appointment of Professor Ivar Ekeland as director of PIMS for a period of 5 years starting September, 1, 2003.

As Director of PIMS, Dr. Ekeland will also chair the Executive Committee of the Banff International Research Station (BIRS). He will also sit on the Steering Committee of the MITACS Network of Centres of Excellence, on the Scientific Board of the Atlantic Association for Research in the Mathematical Sciences (AARMS), and on the Oversight Committee of the National Program on Complex Data Structures (NPCDS).

Professor Ivar Ekeland, who is presently Canada Research Chair in Mathematical Economics at the University of British Columbia, brings to the institute a strong academic standing, excellent administrative and leadership experience, and a far-reaching international network of scientists.

Ivar Ekeland is an outstanding mathematical scientist, an internationally renowned mathematical economist, a dedicated educator, a prolific writer and disseminator of science, and a first class administrator. Ekeland has received prizes from the French Academy of Sciences, the French Mathematical Society, and the Belgian Academy of Sciences. He is a foreign member of the Norwegian Academy of Sciences and he holds honorary doctorates

from UBC and from the University of Saint-Petersburg for Economics and Finance.

As a former President of *Université Paris-Dauphine*, he has extensive experience in leading a large multi-faceted institution and in negotiating support from different levels of government. As former Department Chair, and as Director of the research centres CEREMADE and Institute Finance-Dauphine, he has provided scientific leadership for a large and diverse group of mathematical scientists.

Dr Ekeland has supervised over 35 doctoral dissertations, has organized numerous symposia and has written numerous monographs on Convex analysis, Control theory, Game theory, Catastrophe theory, and Hamiltonian Mechanics. He is the founding editor of the “Annales de l’Institut Henri Poincaré-Analyse nonlineaire” and he sits on the editorial board of many other publications.

Ekeland has also written several books which are reflections on, or popularization of, mathematics. All of them have been translated into many languages. For these contributions, Dr Ekeland was awarded the “Prix Jean Rostand” by the *Association des Écrivains Scientifiques de France* and the “Prix d’Alembert” by the *Société Mathématique de France*. Ekeland is also a regular contributor to the journal “Nature” as well as to the magazine “Pour la Science”.

NEWS FROM THE FIELDS INSTITUTE

This year's thematic program on partial differential equations, organized by W.Craig (McMaster), N. Ercolani (Arizona) and C. Sulem (Toronto), began in August with a 5 day workshop "Calculus of Variations: Geometric Problems, Superconductivity, and Material Microstructures". The fall's activity will center around elliptic and parabolic systems of PDEs arising in super-conductivity and phase transition phenomena in the physics of materials. Three full graduate courses are scheduled, given by W. Craig, C. Sulem and R.McCann (Toronto), and a two week course on mathematical aspects of fluid dynamics will begin on September 15, with instructors W. Craig, C. Dafermos (Brown), C. Fefferman (Princeton) and B. Khesin (Toronto). October will see a symposium on inverse problems organized by A. Nachman (Toronto), and the Coxeter Lectures delivered by L. Craig Evans (Berkeley). A workshop on patterns in physics will be held in November. Please see www.fields.utoronto.ca/programs/scientific/03-04/pde/ for more details as well as a description of the program in the winter semester which will concentrate on Hamiltonian PDEs — in particular hyperbolic equations and nonlinear dispersive evolution equations that arise in mathematical physics and in continuum mechanics — and on the equations of kinetic theory that arise in the study of statistical mechanics and wave turbulence.

The summer is usually a busy time at the Institute, and this summer was certainly no exception. Last winter's thematic program in automorphic forms was capped in June by the

Clay Mathematics Institute Summer School on harmonic analysis, the trace formula and Shimura varieties, organized by James Arthur (Toronto), David Ellwood (Boston & CMI), and Robert Kottwitz (Chicago). Many grad students from around the world filled the Institute to attend the many courses given — four introductory courses, and a series of five advanced courses during the last week.

Also in June, the Fields Institute sponsored a Summer School at the University of Ottawa, organized by the University's logic group; Philip Scott, Richard Blute, and Peter Selinger. It consisted of 2 weeks of courses, followed by a week of workshops in several areas of theoretical computer science. The courses were particularly aimed at graduate students in mathematics, logic, theoretical computer science, mathematical linguistics and related areas. The program culminated in the 18th annual IEEE Symposium on Logic in Computer Science (LICS2003) meeting during the following week. In July, the Institute sponsored (jointly with MITACS) a Summer School at the University of Waterloo in Mathematical Medicine, consisting of 5 week-long introductory mini-courses. This was followed by a three-day Fields workshop on "Applications of Mathematics in Medicine" at the Institute itself during the last week of July. The workshop brought together applied mathematicians and physicians/medical researchers to discuss problems of current interest to the medical community.

NEW FELLOWS OF THE FIELDS INSTITUTE

Wednesday June 18th, 2003

On behalf of Ken Davidson, Director of The Fields Institute, we are pleased to announce that the Board of Directors has named 7 new Fields Institute Fellows for 2003:

Gila Hanna
OISE, University of Toronto

Edwin Perkins
University of British Columbia

Anna Lawniczak
University of Guelph

William Pulleyblank
IBM

John McKay
Concordia University

Nancy Reid
University of Toronto

Kumar Murty
University of Toronto

For more information please visit
www.fields.utoronto.ca

ÉDITORIAL

Robert J. MacG. Dawson

Faites circuler les Notes

En cette ère de l'information, nous assistons depuis quelques années à un intense débat sur l'équilibre entre la « protection de la propriété intellectuelle » et la « libre circulation de l'information ». D'un côté, on voit des sociétés et des artistes réclamer un renforcement des règles entourant la reproduction d'œuvres. Nos voisins du sud ont d'ailleurs adopté de nouvelles lois qui prolongent de 25 ans la protection de nombreuses œuvres en vertu du droit d'auteur. De l'autre côté, on entend de plus en plus de gens — surtout dans certains groupes d'âge — prétendre que le droit d'auteur est une notion carrément dépassée et que l'audio extraction, la gravure et le partage de fichiers sont la voie de l'avenir.

Les arguments des deux camps se tournent aisément en ridicule. On pourrait se demander si les principes en cause dans la prolongation de la protection du droit d'auteur concernent davantage l'artiste qui veut joindre les deux bouts ou la société immortelle (qui souffre à la fin d'un manque d'originalité). Par ailleurs, comment voir autre chose que de l'avidité dans les propos de ceux qui, à propos du piratage d'œuvres musicales, se prennent à dire que « les jeunes le font, alors autant s'y faire ».

Certaines solutions brillent pourtant par leur originalité. La loi canadienne, par exemple, autorise la reproduction d'œuvres musicales à des fins personnelles tout en dédommageant les artistes via une taxe sur les supports d'enregistrement. Cette solution n'est pas parfaite et ne fait pas entièrement l'affaire des consommateurs ni des musiciens, mais on considère généralement qu'elle aboutit à un véritable compromis. On note aussi des initiatives prometteuses pour offrir d'autres mécanismes de protection de la propriété intellectuelle. La *Free Software Foundation*, par exemple, propose « gauche d'auteur » comme moyen de protéger la propriété intellectuelle tout en permettant la libre utilisation du logiciel.

En quoi cela concerne-t-il la communauté mathématique? Les logiciels en cause, on le sait, s'appuient largement sur les mathématiques autant pour comprimer les données des fichiers offerts en partage que pour freiner la distribution de ces fichiers. Paradoxalement, la théorie des nombres, dont l'inutilité faisait la fierté de Hardy, est ici l'une des plus importantes branches des mathématiques!

La plupart des mathématiciennes et des mathématiciens, cependant, font davantage dans la création et l'utilisation du savoir. Nous écrivons des articles et les soumettons à des revues scientifiques. Et ces revues, lorsqu'elles acceptent de publier nos travaux, nous paient rarement. Il arrive même qu'elles nous demandent des frais de publication. Et pour avoir des tirés à part, disons plus de 50, on nous impose un coût par page digne des publications les plus ésotériques ou des ouvrages à reliure artisanale.

Encore là, il y a de bons arguments dans les deux camps. On s'explique mal pourquoi, en présence de deux revues de qualité comparable, l'une coûte cinq fois plus cher que l'autre — surtout que, dans ce dernier cas, on ne sait trop où va l'argent, mais on sait bien que les auteurs et les lecteurs spécialisés sont aussi impayés que ceux de la revue la moins chère. Reste qu'il faut de l'argent pour produire une revue — le *Journal* et le *Bulletin* de la SMC ne font pas exception — et le bon sens veut qu'une partie des profits revienne à l'organisme ou à la société qui la publie.

Quoi qu'il en soit, il est clair qu'un tarif d'abonnement élevé nuit aux ventes. Les bibliothèques abandonnent les revues trop coûteuses, comme pourront certes en témoigner celles et ceux qui œuvrent dans un petit établissement. Même à 50 \$, l'abonnement à une revue aussi peu chère que les Notes de la SMC est parfois hors de portée d'une bibliothèque scolaire.

Encore là, il y a des solutions. Certaines revues, comme le *Journal of Statistical Education* et *Theory and Applications of Categories* n'existent autrement que sous forme électronique, et quiconque peut les télécharger et les lire tout à fait gratuitement. Nous sommes d'ailleurs ravis de rappeler à nos lecteurs que la version électronique des Notes leur est aussi accessible sans frais à l'adresse <http://journals.cms.math.ca/Notes/>.

Donnez l'adresse sur votre site Web. Dites-le à vos étudiants. Passez le mot aux professeurs de votre établissement ou à toute personne susceptible d'être intéressée. Faites circuler les Notes!

SELECTORS OF THE FIRST BOREL OR BAIRE CLASS

Book review by Debora Di Caprio and Stephen Watson, York University

Selectors

John E. Jayne and C. Ambrose Rogers
Princeton University Press, 2002, xiv + 167 pp.



This book gathers together for the first time, into a coherent account, of the theory of selectors of the first Borel and Baire classes. A selector for any function F from a set X to the power set of a set Y (such a function F is called a set-valued map or a multifunction) is a function $f : X \rightarrow Y$ such that $f(x) \in F(x)$ for any x . The existence of a selector f for an arbitrary multifunction F is merely equivalent to the axiom of choice. The existence of “nice” selectors for “nice” set-valued maps can be a much more interesting and difficult question.

When X and Y are topological spaces and the search is for a continuous selector, Michael gave some beautiful sufficient conditions in the mid 1950’s, namely that X be paracompact, Y be a Banach space and that F be lower semicontinuous and have nonempty closed convex values.

A natural variation might be to search for measurable selectors. This book is concerned neither directly with continuous selectors nor with measurable selectors. Rather, it describes the middle ground: selectors of the first Borel class (in which the inverse image of each open set is an \mathcal{F}_σ but not necessarily open) and selectors of the first Baire class (which are pointwise limits of continuous functions).

This study is not however focussed on cases in which Michael’s results do not apply because X fails to be paracompact or Y fails to be a Banach space. Instead this study handles the common situation in which F is not lower semicontinuous but is instead upper semicontinuous. Even the nicest upper semicontinuous maps fail to have continuous

selectors but they do have selectors of the first Borel class. Such selectors are often enough for practical applications.

The existence of selectors of the first Borel class was established in 1965 by Kuratowski and Ryll-Nardzewski who proved that under some additional conditions on the topological spaces involved, every first lower Borel class set-valued map can have a selector of first Borel class (a set-valued map F from X to Y is of first lower Borel class if $F^{-1}(U) = \{x \in X : F(x) \cap U \neq \emptyset\}$ is a \mathcal{F}_σ in X , whenever U is open in Y). This result applies in particular to both lower and upper semi-continuous maps and is the starting point for another big and productive school of thought. The authors of our book not only belong to this school, but are two of the main representatives of it.

The book opens with a motivating introduction, consisting of an updated compendium of the main literature dealing with the existence problem of continuous, first Borel class, and first Baire class selectors. The authors talk about the well-known Michael selection theorem as well as the Kuratowski and Ryll-Nardzewski result on the existence of first Borel class selectors (every lower (or upper) semi-continuous set-valued function from a metric space to a complete separable metric space which takes only nonempty closed values, has a first Borel class selector). Having paid tribute to the classical results, they move to briefly illustrating the more recent results obtained by R.W. Hansell, J.E. Jayne and M. Talagrand (1985), N. Ghoussoub, B. Maurey and W. Schachermayer (1992) and V.V. Srivatsa (1985-86). All of them deal with the existence of a first class selector for upper semi-continuous set-valued functions.

A few basic notions -like the definition of selector, of lower and upper semi-continuous function, and of first Borel and first Baire class- complete the introduction. An overview of this section and some basic knowledge of topology and analysis is all the reader needs to go through the subsequent chapters. This is quite a pleasant aspect of the book, which makes it accessible not only to experts in the field, but also to a broader group of scholars and researchers.

After the first chapter, dedicated to Michael’s Theorem, and the results of Kuratowski and Ryll-Nardzewski, the authors investigate in chapter 2 the conditions under which the uniform limit of a sequence of first Baire class functions is still a first Baire class function, and the ones that guarantee a first Borel class function to be of first Baire class. The search for such conditions involves the use of *discretely* σ -decomposable families and related partitions of metric spaces into \mathcal{F}_σ . The results obtained are used in the

following chapters to construct selectors as uniform limits of suitable sequences of functions, “which are defined to be constant on the sets of some partition of a space into a disjoint discretely σ -decomposable family of \mathcal{F}_σ ”.

In chapter 3 the authors work with several concepts taken from the theory of σ -fragmentability, as well as the notion of a discretely σ -decomposable family. In particular, they give the definition of σ -fragmented by a metric d for a Hausdorff space. Due to the use of these tools, almost all the proofs in chapter 3, 4, and 6 are constructive and/or involve some method of transfinite induction. In spite of the difficulty that always accompanies these kinds of proofs, the authors manage to clearly illustrate them, giving all the necessary details and useful hints.

Chapters 5 and 7 are used for applications. Keeping the clarity of exposition and the preciseness of details that characterize the other chapters, the authors deal with somewhat more geometrical notions in these two chapters. They investigate the existence of a first Baire class selector for

- any maximal monotone map F from a Banach space X to its dual X^* (F is monotone if $\langle x_2 - x_1, x_2^* - x_1^* \rangle \geq 0$, for all choices of $x_1 - x_1, x_2^* - x_1^*$ such that $x_1 \in F(x_1)$ and $x_2^* \in F(x_2)$; F is maximal if there is no monotone map from X to X^* whose graph is a proper superset of $Gr(F) = \bigcup_{x \in X} (\{x\} \times F(x))$);

- any subdifferential map D_f corresponding to a continuous convex function f from a Banach space X to $\mathbb{R} \cup \{\infty\}$ (at a point $x \in X$, D_f is defined by $D_f(x) = \{x^* \in X^* : \forall u \in X, f(x) + \langle u, x^* \rangle \leq f(x + u)\}$);
- any attainment map F_K from a Banach space X to one of its nonempty weak* compact subsets K (F_K is the set-valued map defined by $F_K(x) = \{x^* \in K : \langle x, x^* \rangle = \sup\{\langle x, k^* \rangle : k^* \in K\}\}$);

and the more complicated situation where the selector is the pointwise limit of a sequence of continuous selectors.

Each chapter ends with a section containing remarks and examples. The thoughtful choice of remarks provides a nice guide for further investigating the arguments studied in each chapter. Besides, the examples are well chosen and clearly explained. In conclusion, the wise choice of results presented, the organization of the material, and the many appropriate and concise comments that guide the reader through the main results make this book an irreplaceable reference for whoever may be interested in the existence of selectors of the first Borel class or Baire class, and indeed anyone interested in selection problems of any kind.

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MATHEMATICAL SMORGASBORD WITH AN UNEXPECTED TREAT

Book review by Ian Graham, University of Toronto

Inequalities from Complex Analysis

by John P. D'Angelo

Carus Mathematical Monographs 28

MAA 2002 xv1 + 264pp.



This book considers inequalities and positivity conditions arising in complex analysis in one and several variables. The methods of proof and applications of these inequalities involve various branches of mathematics. Many of the inequalities are classical; however, the book culminates with some recent research results on positivity conditions for polynomials in several complex variables which are analogs of Hilbert's 17th problem. The final chapter ties together the earlier material in a very interesting way, and yet the earlier material is much more than simply preparation for the applications in the final chapter.

The first chapter contains basic material on complex numbers and complex analytic functions. (It is stated that complex analysis is not a prerequisite for reading the book, but really the reader is better off to have had a first course in this subject.) Chapter 2 gives some elementary results about complex Euclidean spaces and Hilbert spaces (projections, adjoints, Riesz representation theorem, etc.).

Chapter 3 introduces just enough of the theory of several complex variables to discuss the Bergman kernel function $K(z, \bar{w})$ on the unit ball B_n in \mathbb{C}^n . The corresponding integral operator gives the orthogonal projection of the space $L^2(B_n)$ onto the closed subspace of square-integrable holomorphic functions $A^2(B_n)$.

Chapter 4 is a very nice chapter on linear transformations and positivity conditions. The spectral theorem for Hermitian linear transformations on \mathbb{C}^n is proved using optimization techniques from multivariable calculus. There

is a complete proof that a linear operator in finite dimensions is positive definite if and only if the leading principal minor determinants are all positive; sums of squares arise in the proof. Inequalities of Hadamard and Hilbert are derived.

Chapter 5 discusses compact operators and also integral operators. (Compact operators make an unexpected appearance in the final chapter.) Compactness is characterized by an estimate, and the spectral theorem is proved for compact Hermitian operators. Boundedness and compactness properties of integral operators are discussed.

Chapter 6 discusses positivity conditions for real-valued functions, especially polynomials, though there is also an excellent section on plurisubharmonic functions. Hilbert's 17th problem (solved in a nonconstructive way by Artin in the 1920's) is to show that a polynomial p in $\mathbb{R}[x_1, \dots, x_n]$ is nonnegative if and only if it can be written as a sum of squares of rational functions. In one variable a sum of squares of polynomials will suffice. A related result of Polya is that if $p \in \mathbb{R}[x_1, \dots, x_n]$ is homogeneous and positive for all nonzero x such that $x_j \geq 0$ for all j , then there exists an integer d and a homogeneous polynomial q such that

$$(x_1, \dots, x_n)^d p(x) = q(x).$$

References are of course given to recent surveys on Hilbert's 17th problem.

At this point (still in Chapter 6) the main focus becomes the study of positivity conditions for polynomials $r : \mathbb{C}^n \times \mathbb{C}^n \rightarrow \mathbb{C}$ of the form $r(z, \bar{w})$, i.e. which are holomorphic in z and conjugate-holomorphic in w , and such that $r(z, \bar{z})$ is real for all z . Analogies with the study of Hermitian forms are pointed out. The class of bihomogeneous polynomials is introduced: a polynomial $r(z, \bar{z})$ is called bihomogeneous of degree $2m$ if it is homogeneous of degree m in z and homogeneous of degree m in \bar{z} . (Results in Hermitian linear algebra may be applied directly to bihomogeneous polynomials such that $r(z, \bar{z})$ is real since such polynomials may be expressed as the pullback of a Hermitian form under the Veronese mapping.) The action of a bihomogeneous polynomial as the kernel of an integral operator on $A^2(B_n)$ and in particular on the space V_k of homogeneous polynomials of degree k is noted. A number of different positivity conditions for polynomials are formulated, and implications among them are discussed.

Chapter 7 gives a complete characterization of bihomogeneous polynomials which are positive when $z \neq 0$, a result of Catlin and D'Angelo and (earlier) Quillen. The

positivity away from the origin of a bihomogeneous polynomial of degree $2m$ is equivalent to any of the following conditions:

- (i) There is an integer d such that the Hermitian matrix of coefficients for $\|z\|^{2d}r(z, \bar{z})$ is positive definite.
- (ii) There is an integer d such that the integral operator on $A^2(B_n)$ with kernel $k_d(z, \bar{w}) = \langle z, w \rangle^d r(z, \bar{w})$ gives a positive definite mapping from V_{m+d} to itself.
- (iii) There is an integer d and a holomorphic homogeneous vector-valued polynomial g of degree $m+d$ such that g vanishes only at the origin and $\|z\|^{2d}r(z, \bar{z}) = \|g(z)\|^2$.
- (iv) r is a quotient $\|g\|^2/\|h\|^2$ of squared norms of holomorphic homogeneous polynomial mappings which vanish only at the origin.

Of course this result is reminiscent of Hilbert's 17th problem. However, the reasons for studying it arise not simply from a desire to generalize but from questions about holomorphic mappings in several complex variables. Another interesting fact is that the theorem of Polya is easily deduced from this result.

Catlin and D'Angelo obtained the characterization (ii) and the other equivalences in 1996 without knowing of Quillen's work. Their method was to show that the operator with kernel $r(z, \bar{w}) K(z, \bar{w})$ can be expressed as the sum of a

compact operator on $L^2(B_n)$ and an operator whose restriction to $A^2(B_n)$ is positive definite; this implies that there is an integer j_0 such that the restriction of the operator to $V_j \subseteq A^2(B_n)$ is positive definite for $j \geq j_0$. Expanding the Bergman kernel function of the unit ball in a series leads to operators with kernels $k_d(z, \bar{w})$.

Quillen obtained the characterization (i) of positive bihomogeneous polynomials in 1968, also using analytical techniques. He used it to give a proof of the Hilbert Nullstellensatz over \mathbb{C} , noting the analogy with the fact that the Fundamental Theorem of Algebra has an analytical proof using Liouville's theorem.

In summary, this book is an appealing combination of ideas from linear and polynomial algebra and analysis. It does not go too deeply into technicalities in any one area, but indicates clearly how the study of inequalities leads to basic questions in operator theory, Fourier analysis, several complex variables, and the interaction of linear algebra and polynomial algebra. It is a mathematical smorgasbord with an unexpected treat at the end. Large parts of the book are accessible to a third or fourth year undergraduate; all of it can be read by a beginning graduate student. The idea that different branches of mathematics have deep and important connections is something which it is desirable to communicate to students as soon as possible, in the reviewer's opinion. This book is very successful at conveying this idea.



Third Pacific Rim Conference on Mathematics

PIMS at the University of British Columbia
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Organizers: G. Fan (Academia Sinica, Beijing), N. Ghoussoub (PIMS and Univ. British Columbia), F.C. Liu (Academia Sinica, Taipei), T.P. Liu (Academia Sinica, Taipei), G. Martin (Univ. Auckland), M. Mimura (Hiroshima Univ.), R.M. Miura (New Jersey Inst. Tech.), C. Rogers (Univ. New South Wales), D. Rolfsen (Univ. British Columbia), N. Trudinger (Australian Natl. Univ.), and R. Wong (City Univ. Hong Kong).

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Information

PRCM2004

Pacific Institute for the Mathematical Sciences
Room 200, 1933 West Mall
University of British Columbia
Vancouver, BC V6T 1Z2, Canada

E-mail: prcm2004@pims.math.ca

URL: <http://www.pims.math.ca/science/2004/prcm/>

Additional information will be posted on this Web page as it becomes available.

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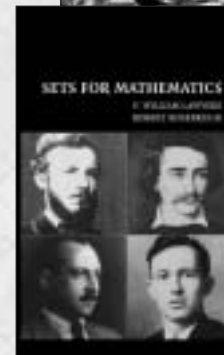
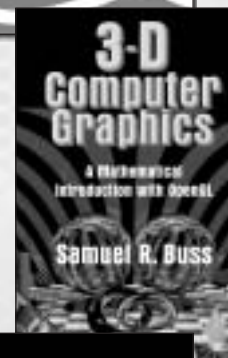
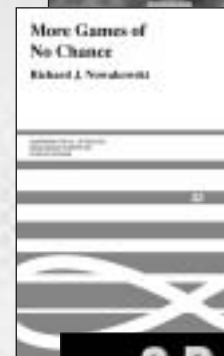
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CANADA RESEARCH CHAIRS IN THE MATHEMATICAL SCIENCES

Reprinted from www.chairs.gc.ca

In the last two issues, the Notes printed research profiles of recently-appointed CRC Chairs in mathematical sciences. This month we bring our list up to date with five more chairs that begin this year.

Karoly Bezdek

Canada Research Chair in Computational Discrete Geometry
The University of Calgary
Tier 1 – July 1, 2003

More and more important research problems require extensive computational skills. Computational discrete geometry is a young and rapidly developing discipline on the boundary of mathematics and computer science. It enables researchers to tackle important problems in such areas as robotics, computer graphics, pattern recognition, shortest paths and networks, crystals and quasicrystals, and manufacturing processes.

Dr. Karoly Bezdek is one of the world's leading researchers in computational discrete geometry, and is known for resolving (with Bob Connelly of Cornell University) the Kneser-Poulsen Conjecture, which was one of the best known open questions of discrete geometry for over forty years. Dr. Bezdek has done much of his work in conjunction with other mathematicians, and is therefore well positioned to lead the development of a new Centre for Computational Discrete Geometry.

The Canada Research Chair will enable the creation of a research group dedicated to discrete geometry, a forum for collaborative research through seminars, joint research projects, a computer laboratory, an electronic journal called Computational Discrete Geometry, and a Web site dedicated to the field.

Dr. Bezdek and his team will also tackle some concrete research problems including, among others, the Kneser-Poulsen Conjecture, the sphere packing problem (as part of Hilbert's 18th problem), the Gohberg-Markus-Hadwiger covering conjecture, the Bateman-Erdős problem in normed planes, and the Minkowski circle packings in normed planes.

The goal of the Centre is to engage a regular stream of short- and medium-term visitors who will have access to a first class computational facility in discrete geometry. Through these collaborations, its electronic journal and its extensive Web site database, this centre will serve as a vital forum for researchers in the field, and will facilitate collaborations globally.

Derek Bingham

Canada Research Chair in Industrial Statistics
Simon Fraser University
Tier 2 – July 1, 2003

The design and analysis of experiments have made important contributions to scientific discovery and innovation, and will continue to do so for the foreseeable future. Industrial applications of statistics have become increasingly important to the advancement of knowledge, and the innovative research has an immediate effect on production and improvement in the quality of products.

Dr. Derek Bingham's research to date can be broadly classified as the development of theory and methodology related to the design and analysis of industrial experiments. He has already shown potential to be a leader in the field, and his work in industrial statistics is considered the definitive work in this area.

The research Dr. Bingham will undertake as Canada Research Chair in Industrial Statistics will focus on developing a new methodology for Bayesian design and analysis of experiments in industrial problems, such as optimal screening designs, response surface optimization and optimal robust parameter designs for product variation reduction; and the design and analysis of split-plot experiments for multi-stage processes. In both cases, the research will explore new and more cost-effective experiment designs for scientific discovery.

The very nature of Dr. Bingham's research effort requires an interaction with industrial partners, and much of the success of the research is assessed by the ability for the developed methods to have an impact upon improvements in product design and manufacturing.

The primary purpose of his Canada Research Chair is to develop an Industrial Statistic Research Laboratory at Simon Fraser University that will be the focal point for collaborations between academic statisticians and industrial partners. One of the main purposes of the facility will be to aid in the quick adoption and development of methodologies that will have immediate impact in Canadian industry, such as those related to hydrogen fuel cells that support sustainable development.

Adrian Iovita

Canada Research Chair in Research in Number Theory
Concordia University
Tier 2 – January 1, 2003

Pure mathematics research is devoted to mathematical reasoning. It seeks to understand fundamental concepts of mathematics, to develop new theorems or formulas, to prove these theorems and to apply them to specific problems.

Today, one of the most important branches of pure mathematics is algebraic number theory, which studies rational numbers (fractions).

This is one of the key focus areas at Concordia's Centre Interuniversitaire en Calcul Mathématiques Algébriques (CICMA), an inter-university research centre of excellence formed in partnership with McGill and Université Laval. The centre houses strong research teams in computational algebra and number theory, mathematical physics, and actuarial mathematics. A key member of the CICMA team focused on advancing number theory, computational algebra and arithmetic algebraic geometry is Dr. Adrian Iovita.

As an innovative mathematical researcher, Dr. Iovita has already gained international recognition for his groundbreaking work in algebraic number theory and its application to geometry and arithmetic. He continually focuses on tackling complex problems that are at the leading edge of current mathematical thinking. Dr. Iovita's most recent work has been concentrated on one of the most dynamical theories to emerge in recent years, a theory known as p-adic cohomology.

As Canada Research Chair in Research in Number Theory, he will work with his CICMA colleagues to expand his pioneering work in this area. Together, they will study and understand the variation of families of objects known as p-adic L-functions attached to families of geometric objects such as curves, surfaces and their respective invariants. These discoveries will be at the forefront of an area that greatly interests many of the world's top mathematics researchers.

In addition to providing a stimulating training environment for students and postdoctoral fellows, Dr. Iovita's challenging program promises to position the CICMA as a North American hub for research excellence in number theory, computational algebra and arithmetic algebraic geometry.

Linda Wahl

Canada Research Chair in Mathematical Biology
The University of Western Ontario
Tier 2 – January 1, 2003

The rapid replication of simple organisms such as bacteria and viruses allows thousands of generations to be bred in the laboratory, permitting the study of their evolution through a broad arc of dynamic change. As a mathematician with a particular interest in biology, Dr. Linda Wahl's area of expertise is in developing mathematical models of microbial evolution and applying those models to a wide range of theoretical problems.

Her program as Canada Research Chair in Mathematical Biology has three themes, each of which has far-reaching applications.

The first theme is experimental evolution, which addresses the need to develop a mathematical framework that will allow researchers to accurately interpret data generated by microbial

evolutionary experiments. Until now, proper analytical tools were not available to apply the findings of microbial evolutionary research to problems such as the rapid adaptation of HIV, the evolution of antibiotic resistance or the ecology of pathogenic bacterial strains in drinking water.

The second theme of her research relates to a specific challenge facing HIV researchers and those on the front lines of treating AIDS patients, the extent to which adherence to a prescribed drug regimen influences the evolution of anti-viral resistance. Dr. Wahl will extend work already underway in conjunction with the Harvard School of Public Health to develop accurate predictive models of how much adherence is necessary to prevent the emergence of anti-viral resistance.

Dr. Wahl's third theme is aimed at finding ways of adapting the division of labour behaviour of organisms like co-viruses, through code development and visualization, for use in the design of large numbers of small, inexpensive robots, or robot swarms. The National Aeronautical and Space Administration (NASA) believes robot swarms will prove useful in the future exploration of space.

35TH CANADIAN MATHEMATICAL OLYMPIAD WINNERS

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János Kramár

University of Toronto Schools, Toronto, Ontario

SECOND PRIZE – Tianyi (David) Han

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THIRD PRIZE – Robert Barrington Leigh

Old Scona Academic High School, Edmonton, Alberta.

HONOURABLE MENTIONS

Olena Bormashenko

Don Mills Collegiate Institute – Toronto, Ontario

Ali Feizmohammadi

Northview Heights S. S. – North York, Ontario

Ralph Furmaniak

A.B. Lucas Secondary School – London, Ontario

Oleg Ivrii

Don Mills Collegiate Institute – Don Mills, Ontario

Andrew Mao

A.B. Lucas Secondary School – London, Ontario

Jacob Tsimerman

University of Toronto Schools – Toronto, Ontario.

2003 ENDOWMENT GRANTS COMPETITION

CALL FOR PROPOSALS

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

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

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

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

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

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

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

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

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

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

Proposals should be sent to the following address:

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

Again, the relevant electronic addresses are:

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

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

CONCOURS DE BOURSES DU FONDS DE DOTATION 2003

APPEL DE PROPOSITIONS

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

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

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

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

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

Le CABFD évaluera les projets qui s'étalent sur un maximum de trois ans. Les projets s'échelonnant sur plusieurs années seront toutefois financés en fonction des

fonds dont disposera le Comité l'année de la demande. Le Comité se limitera aux propositions dont le financement demandé n'excède pas 5 000 \$ par année.

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

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

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

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

Envoyer les propositions à l'adresse suivante :

Concours de bourses du fonds de dotation 2003
Société mathématique du Canada
577, avenue King-Edward, bureau 109 C. P. 450,
succursale A
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Rappel - liste des adresses pertinentes :

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

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June 14-16

QUEEN'S UNIVERSITY AT KINGSTON

Three tenure-track – Mathematics and Statistics

The Department of Mathematics and Statistics invites applications for three tenure-track appointments at the Assistant Professor level to begin July 2004. Successful applicants must have a strong research record and demonstrate the potential for research leadership.

Candidates must have the ability to teach a range of mathematics or statistics courses and supervise graduate students. Salary will be commensurate with qualifications and experience. Exceptionally qualified candidates may be appointed at the rank of Associate Professor. Candidates should have a Ph.D. in pure or applied mathematics, statistics, or a related area. We anticipate hiring in the following three areas:

- algebra and number theory, analysis, dynamical systems, or in exceptional cases other areas of pure mathematics.
- statistics or probability theory; we are interested in applicants working on fundamental problems and applied areas.
- engineering mathematics: geometric control theory, communications theory, or numerical analysis. Candidates in this area must be eligible for registration as a professional engineer in Ontario.

Interested candidates should arrange for a curriculum vitae, a description of research interests, up to five publications or preprints, a statement on teaching or a teaching dossier, and at least four letters of reference, one of which should comment on the candidate's teaching, to be sent to the address below by December 1, 2003 (or January 1, 2004 in the case of candidates for the position in engineering mathematics). Applications will be considered until the position is filled. More details are available at <http://www.mast.queensu.ca/jobs/>

James A. Mingo, Associate Head
Department of Mathematics and Statistics
Queen's University, Kingston
Ontario K7L 3N6
e-mail: position@mast.queensu.ca
fax: (613)533-2964
<http://www.mast.queensu.ca>

All qualified candidates are encouraged to apply; however, Canadian citizens and permanent residents will be given priority. Queen's University is committed to employment equity and welcomes applications from all qualified women and men, including visible minorities, aboriginal people, persons with disabilities, gay men and lesbians. Queen's academic staff are governed by a collective agreement, the details of which are posted at <http://www.queensu.ca/qufa>.

Letters to the Editors / Lettres aux Rédacteurs

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



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

UNIVERSITY OF REGINA

Department of Mathematics & Statistics – Tenure-track position in statistics

The Department of Mathematics and Statistics at the University of Regina invites applications for one tenure-track position in statistics at the rank of Assistant or Associate Professor (depending on experience and qualifications) to commence July 1, 2004.

Applicants should have a Ph.D. degree or expect to complete one by July 1, 2004. Candidates should be committed to excellent teaching and demonstrate strong potential for independent research in an area that could augment or complement the Department's existing research activities.

Current research interests in the Department in statistics and probability include survival analysis, shrinkage estimates and confidence sets, consistency of the bootstrap procedure for non i.i.d. random variables, and limit theorems. In actuarial science these include pension valuation issues and applied stochastic processes and in mathematics, algebra, analysis, discrete mathematics, geometry, linear algebra, number theory, and topology. The successful candidate will also be expected to provide support to the department's actuarial science program on matters pertaining to statistics.

Further information concerning the Department can be obtained from the web page: <http://www.math.uregina.ca/>. Applications must include a curriculum vitae, a research plan, and the names and addresses of at least three references. Applicants should arrange to have their letters of reference sent directly by the referees to the address below. The application deadline is November 15, 2003.

Please address applications to

Dr. Bruce Gilligan, Professor & Head
Department of Mathematics & Statistics
University of Regina
College West 307.14, Regina, Saskatchewan, Canada S4S 0A2.

All qualified candidates are encouraged to apply; however, Canadian citizens and permanent residents will be given priority. The University of Regina is committed to Employment Equity.

UNIVERSITY OF REGINA

Department of Mathematics & Statistics – Tenure-track position in mathematics

The Department of Mathematics and Statistics at the University of Regina invites applications for one tenure-track position in mathematics at the rank of Assistant Professor to commence July 1, 2004.

Applicants should have a Ph.D. degree or expect to complete one by July 1, 2004. Candidates should be committed to excellent teaching and demonstrate strong potential for independent research in an area that could augment or complement the Department's existing research activities.

Current research interests in the Department in mathematics include algebra, analysis, discrete mathematics, geometry, linear algebra, number theory, and topology. In statistics and probability these include survival analysis, shrinkage estimates and confidence sets, consistency of the bootstrap procedure for non i.i.d. random variables, and limit theorems and in actuarial science, pension valuation issues and applied stochastic processes.

Further information concerning the Department can be obtained from the web page: <http://www.math.uregina.ca/>. Applications must include a curriculum vitae, a research plan, and the names and addresses of at least three references. Applicants should arrange to have their letters of reference sent directly by the referees to the address below. The application deadline is November 15, 2003.

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CALENDAR OF EVENTS / CALENDRIER DES ÉVÉNEMENTS

SEPTEMBER	2003	SEPTEMBRE	DECEMBER	2003	DÉCEMBRE
<p>2 - 6 Barcelona Conference on Asymptotic Statistics (Bellaterra, Barcelona, Spain) <i>Vladimir Zaiats: www.crm.es/bas2003</i></p> <p>16 - 20 Barcelona Conference on Set Theory, Bellaterra (Barcelona, Spain) <i>Joan Bagaria: www.crm.es/set-theory</i></p> <p>30 - October 7 Mathematics in Armenia - advances and perspectives (Institute of Mathematics of NAS of Armenia, Yerevan, Armenia) <i>http://math.sci.am/conf.htm</i></p>			<p>22 - 25 International Conference on Analysis and Applications (BHU, Varanasi, India) <i>rspathak@banaras.ernet.in</i></p>		
OCTOBER	2003	OCTOBRE	JANUARY	2004	JANVIER
<p>17-19 Atlantic Provinces Council on the Sciences (APICS) Mathematics, Statistics and Computer Science conference (University of Prince Edward Island, Charlottetown, PEI) <i>www.math.upei.ca/apics2003</i></p> <p>20 - 22 Workshop on Concentration Phenomenon, Transformation Groups and Ramsey theory – University of Ottawa, Ontario, Canada <i>www.fields.utoronto.ca/programs/scientific/03-04/cgr/</i></p> <p>20-24 IMA Workshop 2: Comparative Genomics (University of Minnesota, Minneapolis, MN) <i>http://www.ima.umn.edu/complex/fall/c2.htm</i></p>			<p>21 - 30 Advanced Course on Ramsey Methods in Analysis (Bellaterra, Barcelona, Spain) <i>Joan Bagaria: www.crm.es/RamseyMethods</i></p>		
NOVEMBER	2003	NOVEMBRE	FEBRUARY	2004	FÉVRIER
<p>14-18 Workshop on Patterns in Physics (The Fields Institute, Toronto, ON) <i>www.fields.utoronto.ca/programs/scientific/03-04/pde/physics/index.htm</i></p>			<p>2 - 13 Advanced Course on Contemporary Cryptology (Bellaterra, Barcelona, Spain) <i>Paz Morillo: www.crm.es/ContemporaryCryptology</i></p> <p>9-13 Session on Geometric Aspects of Functional Analysis (GAFA) of the Joint Meeting of the New Zealand Mathematical Society and Israeli Mathematical Union <i>www.mcs.vuw.ac.nz/~mathmeet/vic2004/index.shtml</i></p>		
DECEMBER	2003	DÉCEMBRE	APRIL	2004	AVRIL
<p>6 - 8 CMS Winter Meeting / Réunion d'hiver de la SMC (Simon Fraser University (Harbour Centre, Vancouver, British Columbia) <i>Monique Bouchard: meetings@cms.math.ca</i></p> <p>15 - 19 28th Australasian Conference on Combinatorial Mathematics and Combinatorial Computing (Melbourne, Australia) <i>www.cm.deakin.edu.au/comb2003melbourne</i></p> <p>17 - 20 First Joint AMS-India Mathematics Meeting (Bangalore, India) <i>www.ams.org/meetings/</i></p>			<p>4 - 7 Fractal 2004, Complexity and Fractals in Nature, 8th International Multidisciplinary Conference (Vancouver, BC) <i>www.kingston.ac.uk/fractal/</i></p>		
			MAY	2004	MAI
			<p>28 - 31 International Conference on Mathematics and its Applications - <i>http://www.cityu.edu.hk/rcms/icma2004</i></p>		
			JUNE	2004	JUIN
			<p>Mathematical Foundations of Learning Theory (Barcelona, Spain) <i>Gábor Lugosi: www.crm.es/MathematicalFoundations</i></p> <p>13 - 15 CMS Summer Meeting / Réunion d'été de la SMC (Dalhousie University, Halifax, Nova Scotia) <i>Monique Bouchard: meetings@cms.math.ca</i></p> <p>27 - July 2 European Congress of Mathematics (Stockholm, Sweden) <i>Ari Laptev: laptev@math.kth.se</i></p>		
			JULY	2004	JUILLET
			<p>4 - 11 The 10th International Congress on Mathematical Education (Copenhagen, Denmark) <i>www.ICME-10.dk</i></p>		

JULY 2004 JUILLET

5-9 19th "Summer" Conference on Topology and its Applications (University of Cape Town, South Africa)
<http://www.mth.uct.ac.za/Conferences/Topology>

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

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

JULY 2004 JUILLET

18-24 International Conference on General Relativity and Gravitation (Dublin, Ireland)
 m.a.h.maccallum@qmul.ac.uk

DECEMBER 2004 DÉCEMBRE

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

RATES AND DEADLINES 2003 / TARIFS ET ÉCHÉANCES 2003

Net rates / Tarifs nets	Institutional Members Membres institutionnels	Corporate Members Membres organisationnels	Others Autres
Full page	\$ 235	\$ 440	\$ 585
3/4 page	\$ 215	\$ 400	\$ 535
1/2 page	\$ 145	\$ 265	\$ 355
1/4 page	\$ 85	\$ 160	\$ 215
Inserts: max. 4 pages	\$ 185	\$ 345	\$ 460
Multiple ads discounts available Surcharges apply for prime locations - contact notes-ads@cms.math.ca Des suppléments sont applicables pour des places de choix - communiquer avec notes-ads@smc.math.ca			

Issue/Numéro	Deadline/Date limite
February/février	December 1 décembre
March/mars	January 15 janvier
April/avril	February 15 février
May/mai	March 15 mars
September/septembre	July 1 juillet
October/octobre	August 15 août
November/novembre	September 15 septembre
December/décembre	October 15 octobre
Maximum page size / taille maximum des pages: Back page/4e de couverture: 7.5 x 8.5 in/pouces Inside page/page intérieure: 7.5 x 10 in/pouces	

The CMS Notes is mailed in the first week of the issue month. Subscription to the Notes is included with the CMS membership. For non-CMS members, the subscription rate is \$50 (CDN) for subscribers with Canadian addresses and \$50 (US) for subscribers with non-Canadian addresses.

Les Notes de la SMC sont postées la première semaine du mois de parution. L'adhésion à la SMC comprend l'abonnement aux Notes de la SMC. Le tarif d'abonnement pour les non-membres est de 50 \$ CAN si l'adresse de l'abonné est au Canada et de 50 \$ US autrement.