CMS NOTES de la SMC

CANADIAN WOMEN IN MATHEMATICS

H.E.A. Campbell, *President*

IN THIS ISSUE
DANS CE NUMÉRO

There has been a flurry of comments regarding the proportion of women in Science following media reports of the remarks made by the President of Harvard University, Lawrence Summers.

In Canada, in the discipline of mathematics, the participation of women gives us reason to celebrate. We have an extraordinary number of women who contribute at the highest levels, both in terms of leadership in our community and in terms of their contribution to research.

The CMS has three prizes to honour the outstanding work of our best researchers. The Krieger-Nelson Prize, awarded for outstanding research by a female mathematician, is named for the fundamental contributions of two pioneering Canadian female mathematicians.

Cecelia Krieger was born in Jaslo, Poland in 1894. She studied mathematics and physics at the University of Toronto beginning in 1920. In 1930, Krieger became the first woman - only the third person overall - to earn a mathematics doctorate from a Canadian university. After 12 years of lecturing in mathematics and physics at the University of Toronto, she became an assistant professor and taught there until her retirement in 1962. She is best known for her translation of Sierpinski's celebrated *Introduction to General Topology* (1934) and *General Topology* (1952). Cecelia Krieger died in 1974.

Evelyn M. Nelson, the daughter of Russian immigrants, was born in Hamilton, Ontario, in 1943. She began her studies at the University of Toronto in the Mathematics/Physics/Chemistry honours program, before transferring to McMaster University. She earned her Master's degree in 1967 and published her thesis on the "Finiteness of semigroups of operators in Universal Algebra". Her 1970 Ph.D. thesis, completed just after the birth of her first child, examined "The lattice of equational classes of commutative semigroups". In the late 1970's, she began a study of algebraic problems arising in theoretical computer science; several of her papers appeared in computer science journals. From 1982 to 1984, she chaired the Computer Science Unit within McMaster's Mathematics Department. Evelyn Nelson died in 1987.

Among the recipients of this award is Leah Keshet at the University of British Columbia. Leah 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 modeling. 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 modeling. It has been called "a remarkable demonstration of her deep understanding of a staggering range of problems in mathematical biology".

Barbara Keyfitz is the Director of the Fields Institute in Toronto, world famous for its contributions to research in the mathematical sciences. Dr. Keyfitz was awarded the Krieger-Nelson Prize for her deep and original contributions to the field of nonlinear partial differential equations, with particular emphasis on hyperbolic systems of conservation laws and evolution equations that change type. Such systems arise in models for multiphase flow in porous media, and in two-phase compressible and incompressible flow.

Several times during her career, she had a pioneering role in tackling the most challenging problems in the field, and she opened up a new research direction when she developed a

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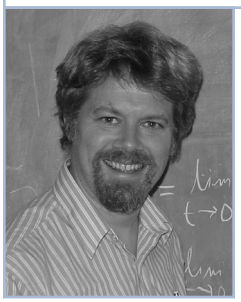
EDITORIAL

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



JUMP AND DELIVER?

You may have watched the inspiring film "Stand and Deliver", based on the real-life teaching successes of Jaime Escalante, and thought "yes, but what we need is something that everybody can learn to do". Canadian author John Mighton's book *The Myth of Ability; Nurturing Mathematical Talent in Every Child* (Anansi, 2003) may be a big step in this direction.

In this book, he sets out and describes in detail a program, JUMP ("Junior Undiscovered Math Prodigies"), that he has developed for teaching the basics of mathematics, especially at a remedial level. It has been tested in many places, with many different instructors, and it seems fairly clear that (a) it works, and (b) anybody can do it. The basic principles are straightforward, and can be summarized in the phrase "Students must be allowed to succeed". Learning is broken down into tiny and carefully-structured chunks, that any student, working with any tutor, can learn thoroughly. A tutor, who does not need any great level of training, follows the child's work carefully. That's pretty much it, at least, on a first pass. And it seems to work brilliantly.

But today's high school textbooks are full of topics such as graph theory, statistics, geometry, and linear algebra; the methodology stresses exploration, discovery, and constructing one's own mental picture of the subject matter. Many professional mathematics instructors will object that the JUMP approach leaves little room for developing creativity, or even self-guided learning skills. These are valid criticisms: or at least, they would be if Mighton or anybody else was putting this forward as a complete and self-contained mathematics curriculum; and I don't think that Mighton is doing so.

It is true that, at times, it seems that while he avoids making claims for his program that go beyond what he has actually observed, he is reluctant to suggest any limitations on it. This may be partially explained through Mighton's own anti-elitist agenda. The title of the book makes the reader wonder whether he really means that there is no such thing as mathematical ability; and he does make it clear [p.21] that he personally does not believe that there is any genetic component to intelligence - a radical view that many won't share, or at least will consider unproven. Does his work with the JUMP program qualify him as an expert on the distribution of potential for mathematical genius? With great respect, I would have to say that it does not; and it is an area with few experts.

Mighton has, I think, demonstrated (as others have done before) that with proper instruction almost everybody can learn elementary mathematics to a level well beyond the contemporary school norms; and thus he has earned the right to be heard *as an authority on that question*. But the use of the word "prodigies" in the title of his program must, I think, be interpreted as a deconstruction: "we're all prodigies so nobody's a prodigy in the old-fashioned elitist sense".

Alas, "the gods have seen it otherwise". If the JUMP program could ever train a significant proportion of its students to the level of (say) today's CMO contestants, let alone Fields Medalists, then Mighton would have demonstrated that the average child in a classroom today is indeed an "undiscovered math prodigy". It seems unlikely that this will happen, and Mighton has never really claimed that it will.

It is true that in the chapter on "Logic and Finite-State Automata", he does demonstrate that some material usually considered as "advanced" can be taught by this method. But there is a big difference between teaching a few isolated skills and teaching the entire subject. It's easy to learn how to count the holes in a pretzel and decide that it has "genus three", hard to finish even the first week of a course in algebraic topology. It's not at all clear that Mighton's methods are sufficient to teach basic theorem-proving, or even the techniques for solving those elementary puzzles that are not amenable to systematic searching.

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JUMP AND DELIVER? *continued*

But that is not the point. Let us consider Mighton's work for what it is - a powerful (if slightly labor-intensive) way to stamp out mathematical helplessness in most children. Is this something today's schools and society need and can use? I think so. Can the program teach skills that we have observed our own students to lack? Definitely.

If we don't have unreasonable expectations, and don't let a few unimportant details of the packaging put us off, this is overall an excellent, thought-provoking, and important contribution to mathematical education. With methods like this to bring students up to speed on the fundamentals, the dream of being able to teach exciting, advanced mathematics to most students could become a reality. Mighton himself makes it clear (see, for instance, page 62) that this is his vision as well.

LE PROGRAMME JUMP

Si vous avez vu l'excellent film *Stand and Deliver*, d'après l'histoire vraie de l'enseignant de mathématiques Jaime Escalante, vous avez peut-être pensé « c'est bien beau, mais il nous faut quelque chose qui soit à la portée de tout le monde ». L'ouvrage de l'auteur canadien John Mighton, intitulé *The Myth of Ability; Nurturing Mathematical Talent in Every Child* (Anansi, 2003), pourrait bien répondre à ce besoin.

Dans ce livre, l'auteur décrit le programme JUMP (*Junior Undiscovered Math Prodigies*) qu'il a conçu pour enseigner les mathématiques de base, en particulier à des élèves en difficulté. Ce programme a été testé à de nombreux endroits et par un grand nombre d'enseignants. En bout de ligne, il ressort assez clairement que a) le programme fonctionne; b) il est à la portée de tout le monde. Les principes de base sont très simples et se résument en une phrase : « Il faut permettre aux élèves de réussir. » L'apprentissage est divisé en mini-blocs soigneusement structurés que tout élève, accompagné d'un tuteur, peut apprendre sur le bout des doigts. Un tuteur, même sans formation exhaustive, suit attentivement le travail de l'enfant. Et c'est à peu près tout, du moins à première vue. Et les résultats semblent remarquables.

De nos jours, toutefois, les manuels de mathématiques du secondaire débordent de sujets (théorie des graphiques, statistique, géométrie, algèbre linéaire, etc.) dont la méthodologie est axée sur l'exploration, la découverte et la construction d'une image mentale. Bon nombre d'enseignants de mathématiques reprocheront au programme JUMP de laisser peu de place à la créativité ou même à l'acquisition de compétences d'auto-apprentissage. Ce sont là des critiques valables. Ou plutôt, elles le seraient si John Mighton ou toute autre personne soutenait que ce programme était complet et parfaitement autonome, ce qui ne semble pas être le cas.

J'admets que l'auteur se garde de prétendre que son programme pourrait avoir une portée supérieure à celle qu'il a observée, mais qu'il hésite aussi à en imposer les limites. Cela tient peut-être en partie aux idées anti-élitistes de J. Mighton. Le titre de l'ouvrage amène les lecteurs à se demander s'il veut vraiment dire que les compétences mathématiques n'existent pas; plus loin dans le livre, il dit clairement [p. 21] qu'il ne croit pas que l'intelligence ait quoi que ce soit à voir avec la génétique. C'est là une opinion radicale que bien des gens ne partagent pas ou qu'ils estiment non prouvées. Ses travaux dans le cadre du programme JUMP font-ils de lui un expert de la distribution du potentiel du génie mathématique? Avec tout le respect que je lui dois, je dois dire que non; en fait, les spécialistes de ce domaine sont rares.

À mon sens, J. Mighton a prouvé (comme d'autres avant lui) qu'avec de bonnes méthodes, il est possible d'enseigner à presque n'importe quel élève les notions élémentaires de mathématiques à un niveau qui dépasse de beaucoup les normes scolaires actuelles. Il mérite donc d'être considéré comme un expert en la matière. Je crois toutefois qu'il faut interpréter le mot « *prodigies* » (prodiges) dans le nom de son programme de la façon suivante : « nous sommes tous des prodiges, alors personne n'est un prodige au sens vieilli et élitiste du terme ».

Malheureusement, les dieux en ont décidé autrement… Si le programme JUMP pouvait véritablement amener un nombre important d'élèves au niveau (par exemple) des participants à l'OMC, voire des récipiendaires de la médaille Fields, J. Mighton aurait montré que l'élève moyen d'aujourd'hui est véritablement un « prodige mathématique inconnu ». Il semble peu vraisemblable que ce soit le cas, et J. Mighton n'a jamais prétendu à cela.

Il est vrai que dans le chapitre sur la logique et les automates d'états, l'auteur montre que des notions généralement classifiées d'« avancées » s'enseignent à l'aide de cette méthode. Il y a cependant une distinction importante entre l'enseignement de quelques compétences isolées et l'enseignement d'un sujet en entier. l est facile d'apprendre à compter les trous dans un bretzel et de décider qu'il est « de genre trois », mais beaucoup plus difficile de terminer la première semaine d'un cours de topologie algébrique. Il n'est pas du tout clair que les méthodes de J. Mighton soient suffisantes pour enseigner la démonstration de théorèmes de base, ou même des techniques permettant de résoudre des problèmes élémentaires qui ne relèvent pas de la recherche systématique.

Mais cela importe peu. Il faut considérer le travail de J. Mighton pour ce qu'il est, soit un moyen puissant (quoiqu'un peu laborieux) d'éliminer chez la plupart des enfants le sentiment d'impuissance par rapport aux mathématiques. Est-ce utile pour nos écoles et notre société? Je crois que oui. Le programme permet-il d'enseigner des compétences qui font cruellement défaut à nos propres étudiants, comme nous l'avons nous-mêmes constaté? Certainement.

Si vous avez des attentes raisonnables et ne vous laissez pas distraire par des détails superficiels (comme le titre), vous constaterez qu'il s'agit là d'une contribution excellente, stimulante et importante pour l'enseignement des mathématiques. Grâce à de telles méthodes qui permettraient d'enseigner rapidement les notions de base, le rêve d'enseigner des mathématiques stimulantes de niveau avancé à la plupart des élèves pourrait devenir réalité. John Mighton indique clairement (à la page 62 par exemple) qu'il voit la chose ainsi lui aussi.

powerful new technique dealing with free boundary problems to further the understanding of trans-sonic shocks. Keyfitz studied also bifurcation problems in reaction-diffusion equations, especially in the theory of shock waves. She succeeded in adapting techniques from vector field dynamics to the problem of the admissibility of shock waves, a long-standing question in applied mathematics. With Suncica Canic and Eun Heui Kim, she is currently working on the analysis of self-similar solutions of systems of conservation laws in two space dimensions.

Other winners of the award include Priscilla Greenwood of the UBC, Lisa Jeffrey at Toronto, Kanta Gupta of Manitoba, Nicole Tomczak-Jaegermann of Alberta, Catherine Sulem of Toronto, Cathleen Morawetz of New York, and Olga Kharlampovich of McGill. Cathleen Morawetz was also awarded the Jeffery-Williams prize which recognizes outstanding contributions to mathematical research.

Lisa Jeffrey was also awarded our Coxeter-James prize which recognizes outstanding research by a younger mathematician. Lisa Jeffrey's research involves significant and difficult problems at the forefront of several deep mathematical areas: symplectic geometry, algebraic geometry, mathematical physics and differential geometry. She has made major contributions to all of these fields.

Dr. Jeffrey has been involved in the proof of two of the most important conjectures in equivariant symplectic geometry. The proof of Witten's conjecture, which she obtained in collaboration with Frances Kirwin, introduced the powerful technique of non-abelian localization which has had important applications.

She is the author of "Quantum Fields and Strings: a Course for Mathematicians" - the definitive work for mathematicians on the important recent interaction between theoretical physics and geometry. Another Coxeter-James prize winner is Izabella Łaba at the UBC. Dr. Łaba is an outstanding young analyst with research interests in Harmonic Analysis, Combinatorics and Mathematical Physics. Her work spans a broad spectrum from pseudo-differential calculus to Szemerédi's theorem, with major contributions to quantum scattering theory and geometric combinatorics.

In her Ph.D. thesis, Łaba made significant contributions to the theory of N-particle scattering in a constant magnetic field, addressing the issue of asymptotic completeness for various Hamiltonians and decaying potentials in the nonlinear Schrödinger equation. She continued this work jointly with Christian Gérard and they presented these results in a monograph in 2002.

A second thread in Łaba's work concerns the Kakeya conjecture on Hausdorff and Minkowski dimension of Besicovitch sets. Her joint work with Nets Katz and Terence Tao is hailed as a breakthrough, surmounting a natural barrier to improving earlier lower bounds by Thomas Wolff and Jean Bourgain. Her current research deals with questions in combinatorial number theory and measure theory, constructing, with Michael T. Lacey, "large" sets of integers without k-progression, and working, with Mihail N. Kolountzakis, on periodic tilings and spectral domains in Euclidean space.

These are the top research honours the Society awards, and they recognize research in the mathematical sciences of the highest quality.

Many talented women have been leaders of our community. Among them we have Katherine Heinrich, currently the Vice-President (Academic) at the University of Regina, who was President of the Canadian Mathematical Society from 1998 to 2000. Christiane Rousseau, at the Université de Montréal, is currently Past President of the Society, having served as President from 2002 to 2004. Christiane is currently leading a bid by the entire mathematical sciences community to hold the International Congress of Mathematicians in Canada in 2010. Nancy Reid, at the University of Toronto, is President of the Statistical Society of Canada, and Mary Thompson at the University of Waterloo is Past President of that Society. These women have contributed a great deal to our communities and we have all benefited from their work.

Women in our community also make fundamental and important contributions to mathematical education in Canada. Christiane Rousseau, Florence Glanfield at the University of Saskatchewan, Katherine Heinrich when she was at Simon Fraser University and Malgorzata Dubiel at Simon Fraser University have all taken leadership roles in nation-wide forums on mathematics education organized by the Society, in organizations such as the Canadian Mathematics Education Subject Group (CMESG) and other educational initiatives in Canada. These initiatives serve to improve the mathematical education of all children in Canada.

Many women (and men!) have built highly successful careers working in the mathematical sciences. Please refer to the web-site

http://mathcentral.uregina.ca/HumanFace/careers/quilt/

where more information can be found. The CMS and Math Central will soon release a poster profiling several women with mathematics degrees with terrific careers working in Canada.

Of course, there are still social barriers faced by women – and other groups – that discourage them from seeking mathematical careers and impede their learning of mathematics. The CMS Women in Mathematics Committee is addressing seriously the matter: see its web-site

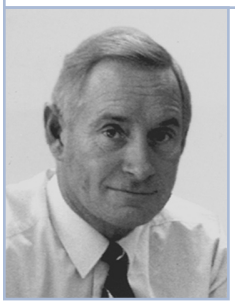
www.cms.math.ca/Women/

There you can read some details about the prize-winning work of the women named above, or find out about the Connecting Women in Mathematics across Canada Conferences. There is a directory of Canadian women working in the mathematical sciences and much else of interest.

In conclusion, there is much work to be done, but there is much to celebrate as well. Come join us and help build a better, richer, more diverse mathematical community of scholars and teachers.

MESSAGE FROM THE EXECUTIVE DIRECTOR

Graham P. Wright



2004 ANNUAL REPORT *A year of change*

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Executive Office

The year started with significant changes in the CMS Executive Office in Ottawa. The Ad-hoc Committee consisting of Eddy Campbell, Christiane Rousseau and Arthur Sherk completed their review of the work-load on the Executive Office and their recommendations were accepted by the Executive Committee and the CMS Board of Directors.

The most significant change was that the position of Operations Manager be abolished and that a full-time Meeting Coordinator position be created. These changes took place in January 2004 and modifications to the duties for each of the other Executive Office positions were instituted at the same time. Ms. Gertrud Jeewanjee was hired as the new Meetings Coordinator effective March 1, 2004. These significant changes were accomplished with limited impact on the overall operations of the Executive Office and the new structure should provide a good framework for the current and future needs of the Society. I am grateful to all the Executive Office staff for their assistance and support during a difficult period.

The CMS was approached by the Statistical Society of Canada (SSC) to submit a proposal for the CMS Executive Office to provide membership and related services to the SSC. With the help of Yvette Roberts (CMS Accountant) and Liliane Sousa (CMS Membership and Publications Agent), a proposal was prepared and it was endorsed by the CMS Finance and Executive Committees. The CMS proposal was accepted by the SSC and, effective December 1, 2004, the Executive Office has been providing these services. I hope that this agreement between the CMS and the SSC will be long-term and will provide benefits to both societies.

Publications

The editors-in-chief of the Canadian Journal of Mathematics (Henri Darmon and Niky Kamran) and the Canadian Mathematical Bulletin (James Lewis, Arturo Pianzola, and Noriko Yui), as well as Craig Platt (Technical Editor), Swami Swaminathan (Associate Technical Editor), Michael Doob (Technical Consultant) and the other staff of the CMS Publications Office, all helped to maintain the excellent scientific reputation and on-time production of our printed and web-based research journals.

Thanks also go to the editors of CRUX with MAYHEM, particularly the Editor-in-Chief, Jim Totten (University College of the Cariboo) and to the editors of the CMS Notes, particularly Robert Dawson (St. Mary's) and Swami Swaminathan (Dalhousie), for their work in ensuring these high quality periodicals continue to appear on schedule.

With the October 2004 issue, changes were made to the on-line delivery of the CMS Notes. These changes have greatly simplified the work involved to provide the on-line versions of the CMS Notes. I wish to thank Nathalie Blanchard (Assistant to the Executive Director), Alan Kelm (Web Services Manager) and Craig Platt for their assistance with this initiative.

The CMS Book Series, published in cooperation with Springer-Verlag continues to be a very successful series. The term of the original Editors-in-Chief, Jonathan Borwein (Dalhousie) and Peter Borwein (SFU) ended in December 2004. They are to be congratulated on the success and current status of this series. Jonathan Borwein agreed to remain as one of the Editors-in-Chief and Karl Dilcher (Dalhousie) was nominated as the second Editor-in-Chief. Their appointments, for five years ending December 31, 2009, have been confirmed by the CMS Board of Directors.

The Society needs to generate more revenues from our publications and the position of Associate Publisher for Books and New Media has been created. Jonathan Borwein was appointed to this new position. A number of initiatives are being explored and it is hoped that new publishing agreements will be signed in 2005.

In 2004, the Publications Office and Executive Office staff continued to provided production and subscription assistance for the Royal Society publication - "Comptes rendus". The situation for 2005 is still being reviewed and it is hoped a decision will be made in the near future.

Meetings

The 2004 Summer Meeting, hosted by Dalhousie University and the 2004 Winter Meeting, hosted by McGill University, were extremely successful from many standpoints. They each featured a large number of plenary, prize and special session speakers and both attracted a large number of delegates (448 for the Summer Meeting and 478 for the Winter Meeting). The Canada-France Meeting in Toulouse in June 2004 was also very successful with over 430 delegates.

It is very encouraging that the size of our meetings continues to increase. Large meetings put additional demands not only the Executive Office Staff but also on all those who volunteer with these meetings - the meeting directors, the local arrangement chairs and the session organizers. The Society is indebted to all of those who contributed to the success of the 2004 Toulouse Meeting and the 2004 Summer and Winter meetings.

To reduce some of the demands on our colleagues at the host university, the CMS Executive Office continues to explore ways to assume more of the administrative load.

Financial Limitations

The Finance and Executive Committees are proposing to create terms of reference whereby the Society would establish a group of "Endowed Funds". The terms of reference will also include a statement on the "principles for the preservation of capital". An article regarding this proposal was included in the December 2004 issue of the CMS Notes and made available through the CMS web-site. Members have been invited to comment on the proposal and it is hoped to provide a final document that will be present to the Board in June 2005 for approval.

The significant increase in the value of the Canadian dollar has resulted in a large decrease in foreign exchange revenues. Although steps are being taken to address this situation, a large deficit is anticipated for 2004 and it was not possible to produce a balanced budget for 2005. Some of the steps being taken include: increased publishing activities, a promotional campaign to increase membership and subscriptions, contract work, and a significant fund raising campaign.

The expenses of the Society are very well controlled but unless ways can be found to generate significant new revenues, it may be necessary to eliminate some existing programs and, furthermore, the CMS will not be able to undertake new initiatives or to respond positively to other groups who look to the CMS for support and assistance.

MATHÉMATICIENNES CANADIENNES

H. E. A. (Eddy) Campbell, Président

Les reportages faisant état des déclarations du recteur de l'Université Harvard, Lawrence Summers, concernant la proportion des femmes en science ont provoqué une avalanche de commentaires.

Au Canada, la participation des femmes en mathématiques fait la joie de tous. En effet, le Canada compte un très grand nombre de femmes qui apportent une contribution de très haut niveau tant par leur rôle prépondérant dans la communauté que par leur apport en recherche.

La SMC a créé trois prix qu'elle remet aux meilleurs chercheurs pour leur travail exceptionnel. Le prix de conférence Krieger-Nelson, décerné à une mathématicienne pour sa contribution remarquable à la recherche, a été nommé en l'honneur de deux mathématiciennes canadiennes pour leur contribution essentielle à titre de pionnières dans ce domaine.

Cecelia Krieger est née à Jaslo en Pologne, en 1894, et a étudié les mathématiques et la physique à l'Université de Toronto dans les années 1920. En 1930, elle devenait la première femme (et la troisième personne seulement) à recevoir un doctorat en mathématiques d'une université canadienne. Après 12 années comme chargée de cours en mathématiques et en physique à l'Université de Toronto, elle est devenue professeure adjointe et a enseigné dans cet établissement jusqu'à sa retraite, en 1962. Elle est surtout connue pour ses traductions des oeuvres célèbres de Sierpinski, *Introduction à la Topologie Générale* (1934) et *Topologie Générale* (1952). Cecelia Krieger est morte en 1974.

Fille d'immigrants russes, Evelyn M. Nelson est née à Hamilton (Ontario) en 1943. Elle s'est d'abord inscrite au programme de spécialisation en mathématiques, physique et chimie de l'Université de Toronto, avant de passer à l'Université McMaster. Elle a obtenu sa maîtrise en 1967 et a publié sa thèse, qu'elle a intitulée *Finiteness of semigroups of operators in Universal Algebra*. Sa thèse de doctorat, terminée en 1970, tout juste après la naissance de son premier enfant, s'intitulait *The lattice of equational classes of commutative semigroups*. À la fin des années 1970, elle a entrepris une étude des problèmes algébriques provenant des sciences informatiques théoriques; plusieurs de ses articles ont d'ailleurs paru dans des revues d'informatique. De 1982 à 1984, elle a été responsable de l'unité d'informatique du département de mathématiques de McMaster. Evelyn Nelson est morte en 1987.

Parmi les récipiendaires du prix se trouve Leah Keshet de l'Université de la Colombie-Britannique. 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 ».

Barbara Keyfitz est directrice de l'Institut Fields à Toronto, reconnu mondialement pour sa contribution à la recherche en mathématiques. Barbara Keyfitz a remporté le prix Krieger-Nelson pour sa contribution approfondie et originale dans le domaine des équations aux dérivées partielles non linéaires et plus particulièrement aux systèmes hyperboliques de lois de conservation et aux équations d'évolution qui changent de type. De tels systèmes sont caractéristiques de modèles d'écoulement multiphase en milieux poreux et d'écoulement biphasé compressible et incompressible.

À plusieurs reprises au cours de sa carrière, elle a été la première à s'attaquer aux problèmes les plus ardus du domaine. En proposant une nouvelle technique puissante liée aux problèmes aux limites libres pour approfondir la compréhension des chocs transsoniques, elle a ouvert la voie à une nouvelle orientation de recherche. Barbara Keyfitz a également étudié les problèmes de bifurcation dans les équations de réaction-diffusion, notamment dans la théorie des ondes de choc. Elle a par exemple réussi à adapter des techniques de la dynamique des champs vectoriels au problème de l'admissibilité des ondes de choc, qui est un problème de longue date en mathématiques appliquées. En ce moment, elle travaille en collaboration avec Suncica Canic et Eun Heui Kim à l'analyse de solutions autosimilaires de systèmes de lois de conservation dans des dimensions bispatiales.

Le prix a également été remis à : Priscilla Greenwood de l'Université de la Colombie-Britannique, Lisa Jeffrey de Toronto, Kanta Gupta du Manitoba, Nicole Tomczak-Jaegermann de l'Alberta,

Catherine Sulem de Toronto, Cathleen Morawetz de New York et Olga Kharlampovich de McGill. Par ailleurs, Cathleen Morawetz a reçu le prix Jeffery-Williams qui récompense une contribution remarquable à la recherche en mathématiques.

De plus, Lisa Jeffrey a remporté le prix Coxeter-James remis à un jeune mathématicien pour ses travaux de recherche exceptionnels. Les travaux de Lisa Jeffrey portent sur de grands problèmes complexes à l'avant-plan de plusieurs domaines mathématiques : la géométrie symplectique, la géométrie algébrique, la physique mathématique et la géométrie différentielle. Elle a grandement contribué à chacun de ces domaines.

Lisa Jeffrey a contribué à prouver deux des plus importantes conjectures de la géométrie symplectique équivariante. La preuve de la conjecture de Witten, qu'elle a établie en collaboration avec Frances Kirwin, a lancé la technique puissante de localisation non abélienne, qui a donné lieu à des applications importantes.

Elle est aussi l'auteure de *Quantum Fields and Strings: a Course for Mathematicians*, référence de base des mathématiciens sur l'interaction importante et récente entre la physique et la géométrie théoriques. Le prix Coxeter-James a également été remis à Izabella Łaba de l'Université de la Colombie-Britannique. Izabella Łaba est une jeune analyste exceptionnelle qui s'intéresse à l'analyse harmonique, à la combinatoire et à la physique mathématique. Ses travaux touchent un large éventail allant du calcul pseudo-différentiel au théorème de Szemerédi, en passant par d'importantes contributions à la théorie de la diffusion quantique et à la combinatoire géométrique.

Dans sa thèse de doctorat, Izabella Łaba a fait une importante contribution à la théorie de la diffusion de N-particules dans un champ magnétique constant, en abordant la question de la complétude asymptotique de divers hamiltoniens, et les potentiels décroissants dans l'équation non linéaire de Schrödinger. Elle a poursuivi ces travaux en collaboration avec Christian Gérard. Ils ont d'ailleurs présenté ensemble leurs résultats dans un ouvrage publié en 2002.

Les travaux de d'Izabella Łaba abordent également la conjecture de Kakeya sur les dimensions Hausdorff et Minkowski des ensembles de Besicovitch. Ses travaux en collaboration avec Nets Katz et Terence Tao sont considérés comme une véritable percée, car ils éliminent un obstacle naturel à l'amélioration des contributions précédentes de Thomas Wolff et Jean Bourgain. Elle concentre actuellement ses recherches sur la théorie combinatoire des nombres et la théorie des mesures. En particulier, elle construit avec Michael T. Lacey de grands ensembles d'entiers sans k-progression et, de concert avec Mihail N. Kolountzakis, elle étudie les pavages périodiques et les domaines spectraux de l'espace euclidien.

Ces prix font partie des plus grands honneurs décernés par la SMC pour récompenser la très grande qualité de la recherche en mathématiques.

Plusieurs femmes très douées ont joué un rôle prépondérant dans la communauté mathématique : Katherine Heinrich, actuellement vice-rectrice à l'enseignement à l'Université de Regina, a été présidente de la Société mathématique du Canada de 1998 à 2000. Christiane Rousseau, de l'Université de Montréal, a occupé le poste de présidente de la Société de 2002 à 2004. Christiane Rousseau dirige actuellement une soumission au nom de toute la communauté mathématique pour organiser le Congrès international des mathématiciens au Canada, en 2010. Nancy Reid, de l'Université de Toronto, est présidente de la Société statistique du Canada (SSC) et Mary Thompson de l'Université de Waterloo est présidente sortante de la SSC. Toutes ces femmes ont apporté leur grande contribution à la communauté, et tous les membres en ont bénéficié.

Les femmes de la communauté mathématique apportent également une contribution essentielle et majeure à l'enseignement des mathématiques au Canada. Christiane Rousseau, Florence Glanfield de l'Université de la Saskatchewan, Katherine Heinrich, quand elle travaillait à l'Université Simon Fraser, et Malgorzata Dubiel de l'Université Simon Fraser ont toutes joué des rôles importants dans les forums sur l'enseignement des mathématiques organisées partout au pays par la Société. Elles ont également guidé des organisations telles que le Groupe canadien d'étude en didactique des mathématiques (GCEDM) et d'autres initiatives en éducation au Canada, dont le but est d'améliorer l'enseignement des mathématiques aux enfants canadiens.

En résumé, de nombreuses femmes (et de nombreux hommes!) ont mené des carrières très prospères en mathématiques. Pour en savoir davantage sur ce sujet, veuillez consulter le site web

http://mathcentral.uregina.ca/fHumanFace/careers/quilt/.

La SMC et La centrale des maths créeront bientôt une affiche présentant plusieurs femmes qui ont obtenu des diplômes en mathématiques et qui poursuivent de brillantes carrières au Canada.

Malheureusement, il existe encore aujourd'hui des barrières sociologiques auxquelles font face les femmes – et d'autres groupes – qui constituent des obstacles à la poursuite d'une carrière en mathématiques et qui freinent leurs apprentissages dans ce domaine. Le Comité des femmes en mathématiques de la SMC prend cette question au sérieux. Consultez le site web du comité au :

http://www.smc.math.ca/Women/.f

pour en savoir plus sur le travail des femmes citées plus haut et sur les prix qu'elles ont reçus. Vous y trouverez également des renseignements sur les conférences du projet « Connecting Women in Mathematics » qui ont lieu partout au Canada. Le site contient en outre un répertoire des mathématiciennes canadiennes et plus encore.

En conclusion, il reste beaucoup à faire, mais nous avons tout de même de nombreuses raisons de nous réjouir. Aidez-nous à bâtir une communauté mathématique de chercheurs et d'enseignants de plus en plus riche, diversifiée et intéressante.

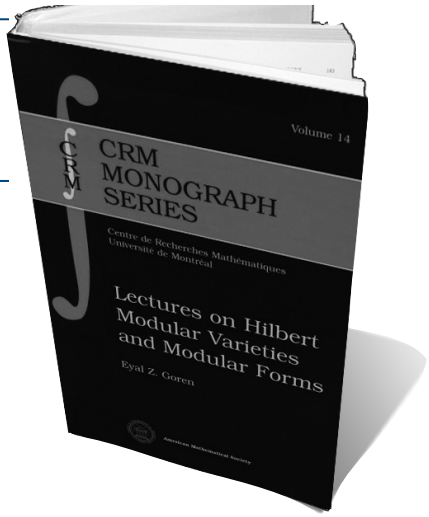
From Elliptic Curves to Abelian Varieties

V. Kumar Murty, University of Toronto

Lectures on Hilbert Modular Varieties and Modular forms

by Eyal Goren

CRM Monographs 14 AMS 2002 ix + 270 pages



Elliptic curves are a classical object of study in number theory. Their arithmetic and geometric properties are beautiful and enigmatic in their own right. In addition, it has been a relatively recent realization that their Diophantine implications are quite far-reaching. (See, for example, the fundamental work of Frey [2].) However, despite this hoary pedigree and an ever-expanding array of connections to diverse problems, the theory of elliptic curves is but a stepping stone to the larger theory of Abelian varieties.

Elliptic curves are, as their name suggests, curves. They have the unique property amongst all curves that an algebraic group law can be defined on their points. Abelian varieties are higher dimensional generalizations of elliptic curves. Thus, they are projective algebraic varieties on which an algebraic group law can be defined. More precisely, an Abelian variety is a commutative connected projective algebraic group. An elliptic curve is a one dimensional Abelian variety.

In studying and classifying Abelian varieties, an important tool is their endomorphism algebra. For an Abelian variety A, consider the set

$$\text{End}\,(A)=\{f \mid f : A \to A\}$$

of maps from A to itself that are both morphisms of algebraic varieties as well as group homomorphisms. The $\mathbb{Q}$-algebra End $(A) \otimes \mathbb{Q}$ is a finite dimensional semisimple algebra. If A is a simple Abelian variety (in the sense that it has no non-trivial Abelian subvarieties), then End $(A) \otimes \mathbb{Q}$ is a division algebra. In characteristic zero, according to the classification of Albert, the division algebras D that can arise as the endomorphism algebra of a simple Abelian variety are of four kinds. Either D is a totally real algebraic number field, or a quaternion division algebra over a totally real number field having the property that it is totally split or totally ramified, or a division algebra over a totally complex quadratic extension of a totally real field.

In all cases, the action of D induces a faithful action on the $2d$-dimensional $\mathbb{Q}$-vector space $H_1(A,\mathbb{Q})$. It follows that the dimension of D over $\mathbb{Q}$ divides $2d$. Consider the fourth case. If D is commutative and of maximal dimension (namely $2d$), then A is said to have *complex multiplication*. This case has been studied extensively in the works of Shimura and Taniyama [6]. The next case which seems to be most amenable to study is that of *real multiplication*. An Abelian variety A is said to have real multiplication if there is a totally real algebraic number field L of degree d which embeds into End $(A) \otimes \mathbb{Q}$. One could require the stronger condition that the full ring of integers OL embeds into the ring End (A) of endomorphisms of A.

The monograph under review is about families of Abelian varieties with real multiplication. They are also referred to as Hilbert-Blumenthal Abelian varieties. Over the complex numbers, these Abelian varieties can be parametrized by a union

$$\cup \Gamma_i \backslash \mathfrak{H}^d$$

of quotients of d-fold products of the upper half plane $\mathfrak{H}$ by arithmetic groups Γ_i. These groups are subgroups of finite index in the group $SL_2(O_L)$ of 2×2 matrices with entries in O_L and of determinant 1. They act on $\mathfrak{H}^d$ via the d-embeddings of L into the real numbers:

$$\begin{pmatrix}\alpha & \beta \\ \gamma & \delta\end{pmatrix}(z_1,\ldots,z_d)=\left(\frac{\alpha^{(1)}z+\beta^{(1)}}{\gamma^{(1)}z+\delta^{(1)}},\ldots,\frac{\alpha^{(d)}z+\beta^{(d)}}{\gamma^{(d)}z+\delta^{(d)}}\right)$$

Modular forms corresponding to these groups are called Hilbert modular forms. More precisely, they are holomorphic functions of d complex variables

$$f : \mathfrak{H}^d \to \mathbb{C}$$

for which there is a vector $(k_1, \ldots, k_d)$ of non-negative integers with the property that for a matrix $\begin{pmatrix}\alpha & \beta \\ \gamma & \delta\end{pmatrix}$ in $OL_2\,(O_L)$ or a suitable subgroup,

$$f\left(\frac{\alpha^{(1)}z+\beta^{(1)}}{\gamma^{(1)}z+\delta^{(1)}},\ldots,\frac{\alpha^{(d)}z+\beta^{(d)}}{\gamma^{(d)}z+\delta^{(d)}}\right)=(\gamma^{(1)}z+\delta^{(1)})^{k_1}\ldots(\gamma^{(d)}z+\delta^{(d)})^{k_d}\,f(z).$$

For $d > 1$, Köcher's theorem implies that such functions are necessarily well-behaved at "infinity" as well. For $d = 1$, this is an additional assumption. Moreover, in practice, one has to consider subgroups Γ of $GL_2(O_L)$ that are commensurable with $SL_2(O_L)$ but which may not be subgroups. In this monograph, the parameter space and the associated modular forms are constructed and studied, not only over the complex numbers but also abstractly from a scheme-theoretic perspective.

The book begins with a general chapter giving some background and preliminary material. Algebraic groups are introduced and the fundamental theorem of Chevalley stating that a connected algebraic group over an algebraically closed field is an extension of a maximal connected affine subgroup by an Abelian variety is stated. Moduli problems (that is, the problem of determining a "nice" parameter space for a collection of geometric objects) are introduced next and the case of elliptic curves is explained in some detail. This sets the scene for discussing classical modular forms.

After this preliminary chapter, Abelian varieties with real multiplication are introduced over the complex numbers in Chapter 2. In this case, the moduli space and Hilbert modular forms can be discussed and constructed explicitly. In Chapter 3, the same theory is developed abstractly over a general field. In particular, Heisenberg groups are introduced to study line bundles, and Serre-Tate coordinates are introduced to study deformations of ordinary Abelian varieties. Moduli spaces of Abelian varieties with real multiplication are studied from this perspective and some properties are proved that are necessary for arithmetic applications, namely to the study of congruences between modular forms and the construction of p-adic L-functions.

In Chapters 4 and 5, the concept of a p-adic modular form, associated to either a classical or a Hilbert modular form, is discussed. These objects arise when one studies p-adic L-functions and deformations of Galois representations. The reader is introduced gently to this subject by following the evolution of some of the key ideas. In particular, in Chapter 4, the explicit method of Serre and Swinnerton-Dyer is presented to approach the construction of p-adic elliptic modular forms. This is then translated into the geometric language of sections of line bundles and correspondences on modular curves. This formulation is the more appropriate one for generalizing these concepts to the case of Hilbert modular forms and this generalization is discussed in Chapter 5. The generalization is far from straightforward. In particular, one is led to consider several (non-canonical) compactifications of the moduli space of Abelian varieties with real multiplications.

In the final chapter, the local deformation theory of Abelian varieties in positive characteristic is studied. This theory goes via the concepts of p-divisible groups, formal groups, Cartier-Dieudonné modules and displays. This chapter introduces the reader to problems being studied at the frontier of this subject.

Throughout the book, there are exercises of varying levels of difficulty. This and the attractive style of writing make it suitable either for a graduate course or for self-study by researchers entering the subject. The monograph itself grew out of a course given at the *Centre de Recherches Mathématiques* during the year 1998-1999 when a thematic program on Number Theory and Arithmetic Geoemtry was held. As the author points out, the material of this monograph can be profitably supplemented by consulting the books of Freitag [1] and van der Geer [3]. Also, the books of Lang [4] and Mumford [5] contain further material on the general theory of Abelian varieties.

References

[1] E. Freitag, *Hilbert modular forms*, Springer, Berlin, 1990.
[2] G. Frey, *Links between solutions of $A - B = C$ and elliptic curves*, Lecture Notes in Mathematics 1380(1989), 31-62.
[3] G. van der Geer, *Hilbert modular surface*s, Springer, Berlin, 1988.
[4] S. Lang, *Abelian Varieties*, Interscience, 1959.
This was reprinted by Springer in 1983.
[5] D. Mumford, *Abelian Varieties*, Tata Institute of Fundamental Research, Oxford, 1974.
[6] G.Shimura and Y. Taniyama, *Complex multiplication of Abelian varieties and its applications to number theory*, Math. Soc. Japan, 1961.(See also G. Shimura, *Abelian varieties with complex multiplication and modular functions*, Princeton University Press, Princeton, 1997).

BOOK REVIEW

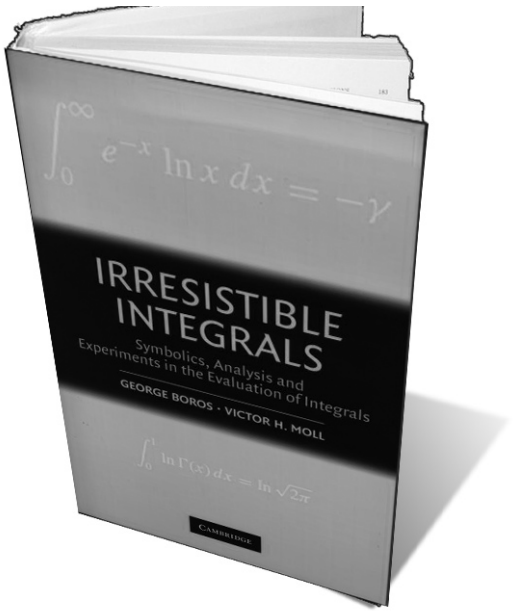
Resisting the Irresistible

Bruce Shawyer, Memorial University of Newfoundland

Irresistible Integrals

George Boros and Victor H. Moll

Cambridge University Press 2004 xiv + 306 pages



This book somewhat belies its title, for, in many respects, I found it quite resistible. Now, there are some good points in the book, but there are also some annoying points. I have consulted with a couple of colleagues (a pure analyst and an applied analyst). What follows includes some of their comments. The book relies heavily on MATHEMATICA™. It is a pity that it did not include MAPLE™, which is available for desktop computers· In my opinion what distinguishes this book from the other books of this sort is the use of MATHEMATICA™ to evaluate integrals symbolically. The book material is at a level accessible to undergraduate students. It could be used as a supplementary book in a number of undergraduate courses. From the point of view of a university mathematics instructor, it is a good source for producing course projects at undergraduate level courses. This may well be the sole reason for a university mathematics instructor having a copy of this book. It is interesting to note the large number of references to material in the *American Mathematical Monthly* (I did not find a single reference to CRUX with MAYHEM). One slightly annoying reference was to a solution to an AMM problem by "Lossers, O.P.". Anyone properly familiar with the problem solving community knows that "O.P. Lossers" (one word) is really the Dutch word "oplossers", which means "solvers". My colleague in fluid dynamics would not recommend the book as a professional book for an applied analyst in fluid mechanics since it is not as comprehensive as the two books commonly used there:

1. *Table of Integrals*, *Series and Products*, 5th edition Gradshteyn, Ryzhik (no proofs were introduced in this book)
2. *Handbook of Mathematical Functions*, Edited by Milton Abramowitz and I.A. Stegun

Of course, the book is far from comprehensive (as stated in the preface). The authors tried to choose material accessible to undergraduate students. The origin of the project that led to this book was a desire to prove **every** result in Gradshteyn and Ryzhik (a nearly impossible task!). Would I recommend purchasing this book? Well, I would be fearful that it would remain on your bookshelf untouched, unless you were teaching a course that required projects with MATHEMATICA™ or MAPLE™.

CMS/CSHPM Summer 2005 Meeting
University of Waterloo
Waterloo, Ontario
June 4-6

The most up-to-date information for the joint Summer 2005 Meeting of the Canadian Mathematical Society (CMS) and the Canadian Society for History and Philosophy of Mathematics (CSHPM) concerning the programme, scheduling and invited speakers list is available on our website, as well as online registration and abstract submission forms.

www.cms.math.ca/Events/summer05/

The Meeting registration form can also be found in the February 2005 issue of the CMS Notes.

Abstracts will appear on the web site as they become available.

Réunion d'été 2005 de la SMC
et de la SCHPM
Université de Waterloo
Waterloo (ON)
4-6 juin

L'information la plus récente de la Réunion d'été 2005 de la Société mathématiques du Canada (SMC) et de la Société canadienne d'histoire et de philosophie des mathématiques (SCHPM), concernant le programme, les horaires et la liste des conférenciers est disponible sur notre site web, ainsi que nos formulaires électroniques d'enregistrement et soumission de résumés.

www.smc.math.ca/reunions/ete05/

Le formulaire d'enregistrement est aussi publié dans les Notes de la SMC de février 2005.

Les résumés de conférences paraîtront sur le site dès qu'ils seront disponibles.

BRIEF BOOK REVIEWS

S. Swaminathan
Dalhousie University, Halifax

Musings of the Masters, An Anthology of Mathematical Reflections

Edited by Raymond G. Ayoub, MAA 2004, xvi + 277 pp.

This anthology is a collection of articles written by renowned mathematicians of the twentieth century. Divided into four parts, Part I (Mathematics and the Intellect) contains articles by Mary Cartwright, Henri Poincaré, Jacques Hadamard, G. H. Hardy, and Hermann Weyl. The authors in Part II (Mathematics and Human Understanding) are Marston Morse, G. D. Birkhoff, David Hilbert and Raymond Wilder. Part III (Mathematics and Society) by J.J. Sylvester, John von Neumann, André Lichnerowicz and André Weil. Part IV (Miscellaneous) by Paul Lévy, Wilhelm Maak, Francesco Severi and Norbert Wiener.

Each article is preceded by a brief biographical sketch of the author and some indication of the content. In many articles there is a common theme – the attempt to define the role of intuition in mathematical activities – intuition as contrasted with pure formalism, a contrast that can be briefly, if too simply, described by asking whether mathematics is invented or discovered.

The editor "hopes that the appearance of these articles in a single place will encourage mathematicians to share with others their perceptions on this beautiful subject, or on other matters dealing more directly with the humanistic side of our nature".

Resources for the Study of Real Analysis

by Robert L. Brabenec, Classroom Resource Materials Series, MAA 2004, xi + 231 pp.

Real analysis is deeply involved with the theoretical issues that underlie the topics of limits, continuity, derivatives, integrals and series that make up the subject matter of calculus. Most students begin their study of real analysis one year or more after completing the study of calculus and find their knowledge of and facility with calculus significantly diminished. Further, a preview of the basic topics, problem types and some idea of the historical development of analysis would enhance the understanding of the deeper arguments and insights of real analysis.

This book provides a collection of materials to supplement a traditional real analysis text. Part I is devoted to a review of calculus. Part II contains thirty-four detailed problems covering a wide variety of topics including both worked examples and exercises. Part III has ten essays, six of which provide a historical overview of the ideas and persons involved in the development of analysis. The other four essays discuss themes such as obtaining derivative formulae, tests of convergence, proof techniques, basic ideas from set theory and topology. Part IV consists of selected readings with historical information.

The book will be useful to students, whether average or bright, and to teachers who need ideas.

Introduction to Coding Theory

by Juergen Bierbrauer
Discrete Mathematics and its Applications
Chapman & Hall/CRC 2005, xxiii + 390 pp.

Coding theory is concerned with error-correcting codes, their construction, bounds on their parameters (e.g. minimum distance), their implementation, etc. As a branch of discrete mathematics it has close ties to mathematical disciplines like design theory, combinatorial theory, linear algebra, finite fields, rings, Galois geometry, geometric algebra, algebraic curves over finite fields and group theory. The best known application is in the transmission of messages over noisy communication channels.

Basic notions and objectives of coding theory are presented in Part I, which can be used for a one-semester undergraduate course. Assuming high school algebra and some acquaintance with linear algebra the following topics are covered: the concept of coding, binary linear codes, general linear codes, Reed-Solomon codes, recursive constructions, universal hashing, binary Golay code, Shannon entropy, asymptotic results and projective planes.

In Part II the emphasis is on cyclic codes, applications and the geometric description of linear codes. The last chapter is devoted to brief survey articles on linear programming bound, algebraic-geometric codes, sphere packings, etc. The mathematical tools needed are developed along the way. Part II can be used for a graduate course.

Applications are introduced and discussed as soon as the codes are developed. Exercises are given at the end of most chapters.

Tribute to a Mathemagician

edited by Barry Cipra, Erik D. Demaine, Martin L. Demaine and Tom Rodgers
A. K. Peters 2005, x + 262 pp.

This book is the third in a series devoted to Martin Gardner, who became famous from his Scientific American "Mathematical Games" column, which began in 1952 and ran for 25 years. Gardner is an avid puzzler and a life-long magician, and Gatherings for Gardner meetings have been held annually in his honour since 1999. This volume is based on many presentations at the most recent such meeting, held in Atlanta in April 2004. The theme for this meeting was 'penta', the Greek word for five; it shows up in several of the articles in the book.

The book also commemorates two great puzzlers: Edward Hordern, who was a master puzzle solver and a puzzle collector, and Nobuyuki Yoshigahara, who was a master puzzle designer. The first four articles of the book recount stories of these two great puzzlers.

The articles are divided into six parts entitled Braintreasures, Brainticklers, Brainteasers, Braintemplers, Braintaunters and Braintools. There are contributions from well known authors like Underwood Dudley, Raymond Smullyan, Peter Winkler and Solomon Golomb.

Sample brainteasers: (1) Identify these two words in which each asterisk marks a missing letter: B*R*A*I*N and * B*R*A*I*N. (2) Agnes loves olives. The tin she has found in the cupboard certainly contained green olives and black olives to begin with, but someone evidently got to it before Agnes did and ate a number of them. The first seven olives Agnes now removes at random from the tin all turn out to be green. The probability of this happening is exactly 50-50. Given that, what can you expect of the colours of the remaining seven olives?

Answers on p 25.

Fourier Series

by Rajendra Bhatia, Classroom Resource Materials Series, MAA 2005x + 120 pp.

This book is a concise introduction to Fourier series covering history, major themes, theorems, examples and applications of the theory to a broad range of problems. It can be used to supplement, enhance and embellish undergraduate courses on mathematical analysis. Directions for further reading are provided, along with a chapter on material at a more advanced level suitable for graduate students.

The 2005 André-Aisenstadt Mathematics Prize awarded to professor Ravi Vakil

March 2005. - The Centre de recherches mathématiques of l'Université de Montréal is pleased to award the 2005 André-Aisenstadt Prize to professor Ravi Vakil of Stanford University. After completing his B.Sc. and M.Sc. at the University of Toronto in 1992, Dr. Vakil obtained his Ph.D. from Harvard University in 1997 under the supervision of Joe Harris. Dr. Vakil then spent a year as a post-doctoral fellow at Princeton University, and three years at MIT as a Moore Instructor, before becoming an Assistant Professor at Stanford in 2001.

Dr. Vakil works in algebraic geometry, investigating the enumerative geometry of projective algebraic curves. His most spectacular work has been done in the last years, in his study of degenerations in a Grassmannian, to solve several old problems in Schubert calculus. One of his conclusions is that all Schubert problems are enumerative over the real numbers. This has been a major goal in the area of real enumerative geometry for at least two decades, and Dr. Vakil has given a complete solution.

The exceptional work of Ravi Vakil was recognized by several prizes and honors, including a NSF Career Fellowship, a Sloan Research Fellowship, a Centennial Fellowship and a G. de B. Robinson Prize.

It is with great pleasure that the CRM awards the 2005 André-Aisenstadt Mathematics Prize to Dr. Ravi Vakil in recognition of research achievement in mathematics. The Prize will be awarded at a ceremony to be held on April 29, 2005 at the CRM.

For further details please visit:
www.crm.umontreal.ca/Vakil/

Prix de mathématiques André-Aisenstadt 2005 attribuer au professeur Ravi Vakil

Mars 2005. - Le Centre de recherches mathématiques de l'Université de Montréal est fier d'attribuer le prix de mathématiques André-Aisenstadt 2005 au professeur Ravi Vakil de Stanford University. M. Vakil termine son baccalaureat et sa maîtrise à l'Université de Toronto en 1992. Puis, il obtient un doctorat du Harvard University en 1997 sous la direction de Joe Harris. Il séjourne ensuite pendant un an à titre de stagiaire post-doctoral à Princeton University puis, il passera trois années au MIT comme instructeur Moore avant de devenir professeur adjoint à Stanford en 2001.

Professeur Vakil travaille en géometrie algébrique et ses travaux portent plus précisement sur la géométrie énumerative des courbes projectives. Son travail le plus spectaculaire a été entrepris au cours des dernières années avec son étude des dégénérations grassmaniennes, pour résoudre des problèmesdans le calcul de Schubert. Une de ses conclusions est que tous les problèmes de Schubert sont énumeratifs sur les réels. Il s'agit là d'un des principaux objectifs dans le domaine de la vraie géométrie énumérative au cours des deux dernières décennies et Professeur Vakil a donné les solutions complètes.

Le travail exceptionnel de Ravi Vakil a été récompensé par de nombreux prix et honneurs y compris la bourse NSF Career, une bourse de recherche Sloan, une bourse Centennial et un Prix G. de B. Robinson.

C'est avec grand plaisir que le CRM attribue le Prix de mathématiques André-Aisenstadt 2005 au professeur Ravi Vakil pour souligner l'excellence de sa recherche en mathématiques. Le Prix sera attribué lors d'une cérémonie qui aura lieu le 29 avril 2005 au CRM.

Pour des renseignements supplémentaires, visitez le : **www.crm.umontreal.ca/Vakil/**

Navigating Calculus.

A software review by Jerry Thornhill,
Southwest Virginia Community College, Richlands, VA 24614.

Navigating Calculus (ISBN 0-618-24976-1), Houghton Mifflin (customer service 1-866-226-5534) List price $33.50

Navigating Calculus is a collection of about 80 interactivities from Houghton Mifflin Company covering single and multivariable calculus. These were written by Jason Brown and were originally intended by the publisher to accompany the Ostobee/Zorn text. However, it can easily be used by any student of calculus. The activities run inside your internet browser. Using *Windows* XP with SP2, I encountered some difficulties getting started. By default, *Internet Explorer* with SP2 blocks active content such as applets and convincing it that I really wanted to run the content proved to be something of a challenge. Installation on one computer seemed to stall and took a very long time to complete.

Once I had *Navigating Calculus* up and running, I found "navigating" very straightforward. There are two frames in the opening window: a contents frame to the left and a main frame to the right. The contents consist of number of expanding menus such as *Chapters*, *Short Applications*, *Theoretical Excursions*, etc. *Chapters* provides access to the interactivities organized according to the contents of the Ostobee/Zorn text. Click on one of the items (e. g., Chapters) and new items appear such as *Chapter 1 Functions and Derivatives*. Click on one of the expanded items and more options appear. There is a *Quick Look* which gives an overview of the particular item and other options which are either *Short Applications* or *Explorations*. The explorations are classified as either *Theoretical Excursions* or *Interactive Examples*. On the main menu, *Short Applications* consists of all the Short Applications that appear in the *Chapters* section, *Theoretical Excursions* collects the Theoretical Excursions from all the Chapters and so on.

Selecting any of the interactivities produces a numbered text summary of the activity in the right frame. Click on any of the numbers and the interactivity starts at that point. Thus if the user has started an activity and left before finishing, he/she could easily resume at any point without starting over. The text for the number appears in the left frame, a picture (often an animation) appears in the right, and a voice reads the text. There is an option to turn the sound off. Typically, a problem is given along with some introductory information. At some point, the user must interact by providing input that will move toward some desired output.

For example, the very first Short Application is the classic problem of creating a box with maximum volume by cutting a square from each corner of a rectangular piece of paper and folding up the sides. The first two pages give an explanation of the problem with an animation of squares being cut out and the box being created. The next page gives the calculation of the volume for a specific size square with the following page giving the volume calculated in terms of the side of a square of variable size. Next the user interacts by changing the size of the side of the square either by dragging the side on the piece of paper or by entering a specific value in an input box. The volume calculation automatically updates. By choosing various values for the side of the square, the user finds a reasonable value for the maximum volume possible. The last page examines the problem graphically and has the user zoom in to the part of the graph where the maximum occurs in order to determine the size of the side that produces maximum volume and what that maximum volume is.

A good example of an Interactive Example is estimating integrals by rectangles. As usual, there are several pages introducing the basic problem ending with an interactive page where the user can experiment with several curves (corresponding, I assume, to examples in Ostobee/Zorn) on various intervals with various numbers of rectangles. The user chooses the number of rectangles to use and drags the tops to get what he/she thinks is a good approximation.

Navigating Calculus includes a graphing calculator with many capabilities. It also allows the user to launch any of the three well known computer algebra systems (*Mathematica*, *Maple*, or *Derive*) from the menu frame.

My overall impression of *Navigating Calculus* is favorable. My guess is that students using Ostobee/Zorn will benefit from it more than students using other books. I recall seeing some references to "the book" which is undoubtedly Ostobee/Zorn. However, many (if not all) of the interactivities would apply to any calculus course.

I do have some issues with the software. First, you must have the CD in the computer to use the software. An installation option to allow running from the hard drive would be more efficient. Second, when there are a number of input boxes to be filled, one must enter the value in one box and then click on the next box to move the cursor. Standard Windows practice would allow one to use the Tab key to navigate the boxes. Even when there is only one box, one must click an OK button to move on. Again, most Windows programs allow using the Enter key to accept input. Another thing that would be useful (especially for instructors using the Graphing Calculator) would be the ability to copy graphs to the Clipboard to paste into a word processor document or into a web page. Finally, there were several times Internet Explorer "locked up" and refused to respond while I was using the software. Blaming the software for this is problematic since Internet Explorer manages to lock up at other times as well.

Reference

Arnold Ostobee and Paul Zorn, *Calculus from Graphical, Numerical, and Symbolic Point of View*, Second edition, Houghton Mifflin, 2002 (ISBN 0-618-24750-5)

Nova Scotia High School Math League

The January 17, 2005 edition of the *Halifax Daily News* carried an account of the Nova Scotia High School Math League, a venture run by **Richard Nowakowski** and two graduate student collaborators **Paul Ottaway** and **Angela Siegel**. Teams of four students from high schools around the province gather together on Saturday mornings to solve problems together. Ten problems are given in sequence, each with a numerical answer. Each team has five minutes to come

up with a solution, and hand in its answer on a sheet (no workings are required). One team, identified by adults circulating and seeing what is going on, is invited to present its solution, while two adults score the answers. The event concludes with a relay question of several parts, in which the answer to the later ones depend on the answer to the previous ones. The event runs in three different regions, Halifax, Truro and Sydney. At the end of the season, on April 30, there will be a provincial championship. More information can be had on the website *http://www.mathstat.dal.ca/~ mathleague*.

Here are two sample problems:

1. *In the sequence of numbers 2, 5, 3, …, each term (starting with the third) is equal to the term preceding it minus the term preceding that one. What is the sum of the first 100 terms of the sequence?*
2. *Circle C_1 has centre (0, 2) and radius 2 and circle C_2 has centre (2, 0) with radius 2. These two circles overlap in the first quadrant. What is the area of overlap?* (A diagram is provided.)

A set of relay problems used in a recent competition consists of the following:

1. *x and y are positive integers so that x2 + y2 = 10. Let A = x + y. Pass on A.*

2. *You will receive A. Let (1 + Ax)2 = c + dx + ex2. Let B = c + d + e. Pass on B.*

3. *You will receive B. Let C = 1 + 2 + …+ B. Pass on C.*

4. *You will receive C. A circle has centre (–3, 3C+27) and radius 5. Let D be the sum of the y–intercepts of the circle. Write down D.*

Using algebra.

Every once in a while, one comes across a mathematical situation suitable for middle or secondary school that seems to encapsulate several important aspects of the use of algebra. Here is one possibility.

Begin with the observation that 1 + 2 = 3. This is likely to attract the assent of everyone in class. On a separate line, write 4 and ask what should come next. After a little messing around, most students realize that consecutive numbers are involved and they arrive at the statement 4 + 5 + 6 = 7 + 8, which is palpably true. At this point, it is not too much of a leap to the fact that 9 + 10 + 11 + 12 = 13 + 14 + 15.

So we now have the beginnings of a list of arithmetic facts. What might the tenth equation in the list be? It is likely that someone will notice that each equation begins with a square, and arrive at

$$100 + 101 + 102 + \ldots + 110 = 111 + 112 + \ldots + 120 .$$

One can check this by totalling each side of the equation, but this can become pretty tedious for longer equations, and in any case does not address the issue of the generality of such equations.

However, we can note the significance of the square term. For example, 100 is 10 ×10, so let us take these ten 10s and distribute them over the rest of the terms on the left side to get

$$(101 + 10) + (102 + 10) + \ldots + (110 + 10) = 111 + 112 + \ldots + 120 .$$

To make this more general, we can codify. Let n be any positive integer. Then

$$\begin{aligned} & n^2 + (n^2 + 1) + (n^2 + 2) + \ldots + (n^2 + n) \\ &= (n \times n) + (n^2 + 1) + (n^2 + 2) + \ldots + (n^2 + n) \\ &= (n^2 + n + 1) + (n^2 + n + 2) + \ldots + (n^2 + 2n) \end{aligned}$$

In this way, algebra fulfils two roles, first as a way of describing a general numerical result, and secondly as a tool for proving an arithmetic result that has infinitely many instances.

From here, there are various directions in which one might go. The first is to imagine what would happen if the number on the left were not a perfect square, but some other composite number, say 12. Would an arithmetic equation be available? From 12 = 3 × 4 = 4 × 3, we can either redistribute three 4s or four 3s over the next few consecutive numbers. The results are:

$$12 + 13 + 14 + 15 = (13 + 4) + (14 + 4) + (15 + 4) = 17 + 18 + 19$$

and

$$\begin{aligned} 12 + 13 + 14 + 15 + 16 &= (13 + 3) + (14 + 3) + (15 + 3) + (16 + 3) \\ &= 16 + 17 + 18 + 19 , \end{aligned}$$

the second reducing to the first, after we cancel the common 16 from both sides. However, this time we have a jump over the equals sign. Here is a general question. Given positive integers m and n with $m > n$, how many examples are there of the sum of a set of m consecutive integers being equal to the sum of a distinct set of n consecutive integers? This appears to be a nice question to induce students to create examples, detect patterns and formulate generalizations.

A second route is to actually calculate in closed form the sum of each side. One way to do this is by summing an arithmetic progression by one of a number of strategies, or by using

the fact that, the left side, for example, is the sum of the consecutive numbers up to n2 + n less the sum up to $n2 - 1$:

$$\frac{(n^2+n)(n^2+n+1)}{2}-\frac{(n^2+1)n^2}{2}=\frac{n(n+1)(n^2+n+1)-n(n+1)n(n-1)}{2}=\frac{n(n+1)(2n+1)}{2}$$

The right side is equal to

$$\frac{(n^2+2n)(n^2+2n+1)}{2}-\frac{(n^2+n)(n^2+n+1)}{2}=\frac{n(n+2)(n+1)^2-n(n+1)(n^2+n+1)}{2}=\frac{n(n+1)(n^2+3n+2-n^2-n-1)}{2}=\frac{n(n+1)(2n+1)}{2}$$

Here the issue is how the workings should be done. An algebraic expression is a carrier of information, some of it latent and some manifest. The goal of algebraic manipulation is to bring to light information that might otherwise remain hidden. One could of course expand out the expressions gained for the sums of the two sides and compare like terms. But I have chosen rather to factor and combine. When this is done, the result is something which some readers might recognize (and which, if you are doing this with a Grade 12 class, you might try to elicit from the students). The common sum of the two sides is three times the sum of the first n squares. So algebra becomes a tool of discovery, but a tool that is usable only by students who have sufficient experience to turn an expression around and recognize an interesting fact or pattern when it appears.

For students in lower grades, one might try in some way to bring out the fact that

$$1 + 2 = 3 = 3(1^2)$$

$$4 + 5 + 6 = 7 + 8 = 3(1^2 + 2^2)$$

$$9 + 10 + 11 + 12 = 13 + 14 + 15 = 3(1^2 + 2^2 + 3^2)$$

and so forth. I do not know how one would prove this in a way that is intelligible to a Grade 9 class without spending a lot of time in setting it up. Perhaps some reader has a suggestion. However, even if time does not permit a proof, one might hope that sufficiently much has transpired in class to hold before the students the hope that with more background they will have the power to handle the proof later in their high school experience.

Of course, we can put a lot of equations together to arrive at the general result that

$$1 + 2 + 3 + \ldots + (n^2 - 1) = 6\,[1^2 + (1^2 + 2^2) + (1^2 + 2^2 + 3^2) + \ldots + (1^2 + 2^2 + \ldots + (n-1)^2]\,.$$

Is there an insightful way to see this? One is reminded of the result that

$$\sum\{\,\min(i,j) : 1 \le i,j \le n\,\} = 1^2 + 2^2 + 3^2 + \ldots + n^2\,,$$

which may have some bearing on the situation.

A linear algebra question.

I was speaking with a colleague who gave the following question on a linear algebra test: *Let A be a square $n \times n$ matrix. Prove that there exists a polynomial p for which p(A) is a singular matrix.* The hint to consider the set $S \equiv \{ x, Ax, A^2x, \ldots, A^n x \}$ for some nonzero n–vector x was provided. He was disappointed at the scarcity of correct solutions. (The Cayley-Hamilton Theorem was not available.)

While the hint gave a fairly good leg up on the solution, there was still a great deal that a student had to know or understand in order to effect it. It seems worthwhile to bring out the many aspects of the situation and realize what a considerable question this might be for many students. The solution solicited required first of all that the student identify the productive criterion for singularity, to wit that the kernel of an operator was not zero. (If, for example, the student fixed on the vanishing of the determinant or the rank of the operator, then he was likely in serious difficulty.) Next, the student had to be aware that the set S, consisting of $n+1$ elements, was linearly dependent, and that this fact was significant. Thus, one could find constants not all zero for which $c_0x + c_1Ax + c_2A^2x + \ldots + c_nA^nx$ was the zero vector. The key stage is at hand, and this is to adopt the mathematical procedure of looking at an expression with two sets of eyes. The important conceptual jump is to take this linear combination of vectors and consider it rather as an operator applied to a single vector $(c_0I + c_1A + \ldots + c_nA^n)(x)$, and then to recognize that its vanishing said something about the kernel of the operator.

It would be useful to take some of the standard questions that we assign to students, and parse them for what they entail from the viewpoint of mathematical practice, conventions, insights, concepts and strategy, and then to consider strategies that we might use to help bring students along to the point where they can tackle questions with confidence and insight. This column is open to contributions from the readers along these lines.

NEWS FROM DEPARTMENTS

University of Northern British Columbia, Prince George, BC

Promotion and tenure: Patrick Montgomery (Associate Professor, July 2005)

Appointment: Kevin Keen (Assistant Professor, Statistics, 2004-June 2005)

Awards/Distinctions: Jennifer Hyndman and Lee Keener, recipients of the UNBC Teaching Excellence Award, 2003

Other News: (1) A Math-Physics Symposium, organized by the Mathematics Student Society was held January 12-16, 2004. (2) We have added the Economics-Mathematics joint major to our degree program pool. (3) Julian Buck (UNBC Silver Medal Award winning undergraduate Math major,now a doctoral student at the University of Oregon) won two NSERC USRA's in a row, working with Sam Walters on Operator Algebra problems.

CALL FOR NEWS FROM DEPARTMENTS

This is a request for news items to appear in the next issue of the *NOTES*. REPLY to `notes-editors@cms.math.ca` by the deadlines indicated at the back of this issue.

Our intention is to circulate this reminder at least once per term, but this column will appear in all 8 issues (Sept, Oct, Nov, Dec, Feb, Mar, Apr, May) and your news will always be welcome. We hope that departments will submit news at least once per term.

PLEASE USE THE FORMAT GIVEN BELOW.
Appointments (rank, date, field):
Promotions (rank, date):
Retirements (rank, date):
Resignations:
Death (rank, date):
Awards/Distinctions :
Visitors (name, country, area, dates):
Other News:

Université Laval, Québec, Qc

Promotions: Les professeurs Daniel Le Roux et Javad Mashreghi seront promus professeurs agrégés le premier juin 2005. La professeure Aurélie Labbe est devenue professeure adjointe le premier mars 2005 après la soutenance réussie de sa thèse de doctorat.

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

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

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

Letters to the Editors / Lettres aux Rédacteurs

The Editors of the Noteswelcome 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 Notesacceptent 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 a l'addresse suivante: `notes-lettres@smc.math.ca`.

2005 CMS MEMBERSHIPS / ADHÉSIONS 2005 À LA SMC

Membership renewal notices have been mailed. Please renew your membership now. To renew electronically please visit our website.

`www.cms.math.ca/members/`

Les avis d.adhésion ont été postés. Veuillez renouveller votre adhésion maintenant. Vous pouvez aussi renouveller au site Web.

`www.cms.math.ca/members.f/`

CALL FOR SESSIONS / PROPOSITIONS DE SESSIONS

CMS SUMMER 2006 MEETING

Additional self-supported sessions play an important role in the success of our meetings. The CMS welcomes and invites proposals for self-supported sessions for this meeting (June 3-5, 2006) at the Westin Hotel, Calgary. Proposals should include a brief description of the focus and purpose of the session, the number and expected length of the talks, as well as the organizer's name, complete address, telephone number, e-mail address, etc. These additional sessions will be incorporated with the other sessions in time blocks allocated by the Meeting Director. All sessions will be advertised in the CMS Notes, on the web sites and, if possible, in the Notices of the AMS and in publications of other societies. Speakers in these additional sessions will be requested to submit abstracts which will be published on the web site and in the meeting programme. Those wishing to organize a session should send a proposal to the Meeting Director by the deadline below.

Deadline: June 15, 2005

In addition to various plenary and prize lectures, the following sessions will be taking place:

Game Theory / Number Theory in Honour of Richard Guy's 90th Birthday
Organizers: Bill Sands, Robert Woodrow and Hugh Williams (University of Calgary), Richard Nowakowski (Dalhousie University)

Positivity in Functional Analysis and Applications
Organizers: Charalambos Aliprantis (Purdue University) and Vladimir Troitsky (University of Alberta)

Category Theory
Organizer: Robin Cockett (University of Calgary)

Model Theory
Organizer: Patrick Speissegger (McMaster University)

Set Theory and Infinitary Combinatorics
Organizer: Stevo Todorcevic (University of Toronto)

Mathematical Finance
Organizers: Anatoliy Swishchuk and Len Bos (University of Calgary)

Meeting Director / Directeur de la réunion:
Claude Laflamme
CMS Summer 2006 Meeting
Department of Mathematics & Statistics
University of Calgary
2500 University Drive N.W.
Calgary, Alberta T2N 1N4
laf@math.ucalgary.ca

RÉUNION D'ÉTÉ 2006 DE LA SMC

Les sessions complémentaires autonomes jouent un rôle important dans le succès de nos Réunions. La SMC vous invitent à proposer des sessions autonomes pour son congrès qui se tiendra à Westin Hotel, Calgary (du 3 au 5 juin 2006). Toute proposition doit inclure une brève description de l'orientation et des objectifs de la session, le nombre de communications prévues et leur durée ainsi que le nom, l'adresse complète, le numéro de téléphone, le courriel et autres coordonnées de l'organisateur. Ces sessions complémentaires seront intégrées aux autres sessions du programme, dans des cases horaires prévues à cet effet par le directeur de la Réunion. Toutes les sessions seront annoncées dans les Notes de la SMC, sur le site web et, si possible, dans le bulletin de l'AMS et les publications d'autres sociétés. Les conférenciers de ces sessions complémentaires devront présenter un résumé qui sera publié sur le site web et dans le programme de la Réunion. Toute personne qui souhaiterait organiser une session est priée de faire parvenir une proposition au directeur de la Réunion avant la date limite ci-dessous.

Date limite : 15 juin 2005

Aux différentes conférences plénières et de prix s'ajouteront les sessions suivantes:

Théorie des jeux et des nombres en l'honneur du 90e anniversaire de Richard Guy
Organisateurs : Bill Sands, Robert Woodrow et Hugh Williams (Université de Calgary), Richard Nowakowski (Université Dalhousie)

Positivité an analyse fonctionnelle et applications
Organisateurs : Charalambos Aliprantis (Purdue University) et Vladimir Troitsky (Université de l'Alberta)

Théorie des catégories
Organisateur : Robin Cockett (Université de Calgary)

Théorie des modèles
Organisateur : Patrick Speissegger (Université McMaster)

Théorie des ensembles et combinatoire infinie
Organisateur : Stevo Todorcevic (Université de Toronto)

Finance mathématique
Organisateurs : Anatoliy Swishchuk et Len Bos (Université de Calgary)

MESSAGE FROM THE VICE-PRESIDENT - Western Provinces

Samuel Shen
University of Alberta

Canada Bidding for the 2011 International Congress on Industrial and Applied Mathematics

The CMS, as an Associate Member Society of the ICIAM (International Council for Industrial and Applied Mathematics), is supporting the bid by CAIMS (Canadian Applied and Industrial Mathematics Society), MITACS (Mathematics of Information Technology and Complex systems), and SIAM (Society for Industrial and Applied Mathematics) to host the 2011 International Congress on Industrial and Applied Mathematics in Vancouver, July 11-16, 2011. ICIAM President Ian Sloan and the 2007 ICIAM Congress Chairman Rolf Jeltsch made a site visit to Vancouver on November 4, 2004. Representatives from relevant organizations of Canada and the United States participated in the site visit and explained the facilities and scientific programs to the visitors of the congress.

I represented the CMS at the site visit; PIMS Director Ivar Ekeland and Simon Fraser University President Michael Stevenson were also present. Four Tourism Vancouver staff members explained the functions of the congress facilities; the main ICIAM 2011 congress venue will be the Vancouver Convention and Exhibition Center with some sessions held at the Simon Fraser University's Harbour Center campus.

It was agreed that MITACS and SIAM would share the financial responsibilities and congress logistics. To maximize the possibility of strong support from the Canadian government for both ICM 2010 and ICIAM 2011 in Canada, CMS, CAIMS, and MITACS submitted a joint letter to the Ministry of Industry requesting governmental support for the two world congresses on mathematics.

Canada's bid for the ICIAM 2011 is facing formidable competition with China, whose bid site is Beijing. Member societies will vote on the ICIAM 2011 site at the May 21, 2005 ICIAM council meeting in Florence, Italy. CMS, as a large Associate Member Society, has one vote. CAIMS has one vote, SIAM (a large member society) has two votes, and AMS has one vote.

MESSAGE DU VICE-PRÉSIDENT - provinces de l'Ouest

Samuel Shen
Université de l'Alberta

La candidature du Canada pour l'obtention du Congrès international de mathématiques appliquées et industrielles 2011

À titre de membre associé de l'ICIAM (International Council for Industrial and Applied Mathematics), la SMC appuie la candidature de la Société canadienne de mathématiques appliquées et industrielles (SCMAI), du Réseau de centres d'excellence en mathématiques des technologies de l'information et des systèmes complexes (MITACS) et de la SIAM (Society for Industrial and Applied Mathematics) pour l'obtention du Congrès international de mathématiques appliquées et industrielles (CIMAI) 2011 à Vancouver du 11 au 16 juillet 2011. Le président de l'ICIAM, Ian Sloan, et le président du congrès de 2007, Rolf Jeltsch, se sont rendus à Vancouver le 4 novembre 2004. Des représentants des organismes canadiens et américains concernés ont également pris part à la visite et ont présenté les lieux et les programmes scientifiques aux visiteurs.

J'étais le représentant de la SMC au cours de cette visite. Ivar Ekeland, directeur du PIMS, et Michael Stevenson, recteur de l'Université Simon Fraser, étaient aussi de la partie. Quatre représentants du bureau de tourisme de Vancouver ont présenté les endroits prévus pour accueillir le congrès en 2011. La plupart des activités se tiendront au Vancouver Convention and Exhibition Center, et quelques-unes au campus Harbour Center de Simon Fraser.

Il est entendu que le réseau MITACS et la SIAM se partageraient les responsabilités financières et la logistique du congrès. Pour maximiser les possibilités d'obtenir le plus de financement possible du gouvernement fédéral pour le CIM 2010 et le CIMAI 2011 au Canada, la SMC, la SCMAI et le Réseau MITACS ont envoyé une lettre commune au ministre de l'Industrie pour demander le soutien du gouvernement à ces deux congrès mondiaux de mathématiques.

La Chine (Beijing) livre une concurrence féroce au Canada pour l'obtention du CIMAI 2011. Les sociétés membres voteront sur l'emplacement du CIMAI 2011 au conseil de l'ICIAM du 21 mai 2005 qui se tiendra à Florence, en Italie. La SMC, à titre de membre associé, a un vote, tout comme la SCMAI et l'AMS. En tant que grande société membre, la SIAM a deux votes.

MESSAGE DU DIRECTEUR ADMINISTRATIF Graham P. Wright

RAPPORT ANNUEL 2004 - *Une année de changements*

Bureau administratif

L'année a commencé par de grands changements au Bureau administratif de la SMC à Ottawa. Le comité spécial composé d'Eddy Campbell, de Christiane Rousseau et d'Arthur Sherk a terminé son examen du travail du bureau administratif, et leurs recommandations ont été entérinées par le Comité exécutif et le Conseil d'administration de la SMC.

Le changement le plus important a été l'abolition du poste de chef des opérations et la création d'un poste de coordination des Réunions à plein temps. Ces changements ont eu lieu en janvier 2004, et les nouvelles descriptions de tâche des autres employés du bureau administratif sont entrées en vigueur en même temps. M^{me} Gertrud Jeewanjee a été embauchée à titre de coordonnatrice des Réunions en date du 1er mars 2004. Ces changements se sont produits sans trop nuire aux activités du bureau, et la nouvelle structure devrait bien répondre aux besoins actuels et futurs de la Société. Je remercie tous les employés du bureau administratif de leur aide et de leur appui durant cette période difficile.

La Société statistique du Canada (SSC) a demandé à la SMC de lui soumettre une offre de services d'adhésion et autres services connexes. Yvette Roberts (comptable) et Liliane Sousa (responsable de l'adhésion et des publications) ont ainsi participé au montage d'une proposition, qui a par la suite été acceptée par le Comité des finances et le Comité exécutif de la SMC. La SSC a accepté cette proposition, et le bureau administratif de la SMC offre les services susmentionnés depuis le 1er décembre 2004. J'espère qu'il s'agit d'une entente à long terme entre la SMC et la SSC, et qu'elle sera bénéfique aux deux sociétés.

Publications

Les rédacteurs en chef du *Journal canadien de mathématiques* (Henri Darmon et Niky Kamran) et du *Bulletin canadien de mathématiques* (James Lewis, Arturo Pianzola et Noriko Yui), ainsi que Craig Platt (rédacteur technique), Swami Swaminathan (rédacteur technique adjoint), Michael Doob (conseiller technique) et les autres employés du bureau des publications de la SMC ont tous contribué à préserver l'excellente réputation scientifique de nos revues imprimées et électroniques, tout en respectant les calendriers de production.

Merci aussi aux rédacteurs de *CRUX with MAYHEM*, notamment au rédacteur en chef Jim Totten (University College of the Cariboo), ainsi qu'aux rédacteurs des *Notes de la SMC*, en particulier Robert Dawson (St. Mary's) et Swami Swaminathan (Dalhousie), de veiller à ce que ces périodiques de grande qualité paraissent aux moments convenus.

Des changements ont aussi été apportés au processus de la publication en ligne des *Notes* à partir du numéro d'octobre 2004. Ces changements ont grandement simplifié la production de la version Web des *Notes*. J'aimerais remercier Nathalie Blanchard (adjointe au directeur administratif), Alan Kelm (gestionnaire des services Web) et Craig Platt de leur aide dans ce projet.

La collection « Ouvrages de mathématiques de la SMC », publiée en collaboration avec Springer-Verlag, demeure en très bonne posture. Le mandat des deux rédacteurs en chef d'origine, Jonathan Borwein (Dalhousie) et Peter Borwein (SFU), a pris fin en décembre 2004. Ils méritent nos remerciements pour le succès que remporte cette collection et sa situation actuelle. Jonathan Borwein a accepté de rester en poste, et Karl Dilcher (Dalhousie) a accepté l'autre poste de rédacteur en chef. Leurs mandats, d'une durée de cinq ans, soit jusqu'au 31 décembre 2009, ont été confirmés par le Conseil d'administration de la SMC.

La Société doit augmenter les recettes de la vente de ses publications. À cette fin, elle a créé un poste d'éditeur adjoint, livres et nouveaux médias, qu'a accepté Jonathan Borwein. Plusieurs projets sont à l'étude, et l'on espère conclure de nouvelles ententes de publication en 2005.

En 2004, le bureau des publications et le bureau administratif ont à nouveau offert leur appui (publication et adhésion) à la production des *Comptes rendus* de la Société royale. On examine toujours la situation pour 2005 et l'on espère une décision dans un avenir rapproché.

Réunions

La Réunion d'été 2004, tenue à l'Université Dalhousie, et la Réunion d'hiver 2004, tenue à l'Université McGill, ont remporté un franc succès à de nombreux égards. Elles présentaient toutes deux un grand nombre de conférenciers (principaux, primés, etc.) et ont attiré un grand nombre de participants (448 à la Réunion d'été et 478 à la Réunion d'hiver). Le congrès Canada-France de Toulouse, tenu en juin 2004, a lui aussi été très réussi; il a attiré plus de 430 participants.

Il est très encourageant de voir que nos Réunions continuent de prendre de l'envergure. Toutefois, les grands congrès alourdissent non seulement la tâche du personnel du bureau administratif, mais aussi celle des bénévoles qui participent à leur organisation – les directeurs de la Réunion, les présidents du Comité de logistique et les organisateurs de sessions. Aussi, la Société doit-elle une fière chandelle à toutes les personnes qui ont contribué au succès retentissant du congrès de Toulouse 2004 ainsi que des Réunions d'été et d'hiver 2004 de la SMC.

Afin d'alléger la tâche de nos collègues des universités hôtes, le bureau administratif de la SMC cherche toujours des façons d'absorber une plus large part des tâches administratives.

Contraintes financières

Le Comité des finances et le Comité exécutif proposent l'adoption de conditions relatives à la création d'un groupe de fonds de dotation. Ces conditions comprendront également des « Principes de conservation du capital ». Un article à ce sujet est d'ailleurs paru dans les *Notes de la SMC* de décembre 2004 et a été publié sur le site de la SMC. Les membres ont été invités à commenter la proposition, et l'on espère soumettre un document final à l'approbation du Conseil en juin 2005.

RAPPORT ANNUEL 2004 - *Une année de changements*

L'augmentation significative de la valeur du dollar canadien a entraîné une importante chute des recettes liées au taux de change. Même si l'on prend des mesures pour gérer cette situation, on prévoit tout de même un déficit important pour 2004, et il a été impossible d'établir un budget équilibré pour 2005. Entre autres mesures prises, mentionnons une augmentation des activités de publication, une campagne de promotion visant à augmenter le nombre de membres et d'abonnés, les offres de services et une campagne de financement de grande envergure.

Les dépenses de la Société sont très bien contrôlées, mais à moins de trouver des moyens d'accroître considérablement nos recettes, nous pourrions être forcés d'éliminer certains programmes actuels. En outre, la SMC ne pourra entreprendre de nouveaux projets ni accéder aux demandes d'autres groupes qui sollicitent son appui.

CMS COMMITTEES 2004 ANNUAL REPORTS

EDUCATION COMMITTEE

Richard Caron, University of Windsor

The Committee met at both the 2004 Summer and Winter Meetings. The Summer Meeting was dominated by discussions related to the 2003 Mathematical Education Forum. At the Winter Meeting the Committee was updated on activities related to the planning of the follow-up Forum to be held in 2005. In addition, the meetings were occupied with reports on activities taking place throughout the year – in summary:

- The 2004 Adrien Pouliot Award was given to Professeur Jean-Marie de Koninck.

- The Chair acted as one of three referees for the second CMS Teaching Excellence Award. The winner is Dr. Philip Loewen and he will receive the award at the Summer 2005 Meeting.

- The Committee awarded grants to all 6 applicants for support of provincial competitions. The total awarded was $3,500. The applicants were from P.E.I., Newfoundland, Québec, Ontario, Manitoba, and Alberta. Over 3000 students participate in the various contests with close to 50% being female.

- The Education sessions at the 2004 Summer Meeting in Halifax were organized by Richard Hoshino and John Grant McLoughlin. There was a pre-conference workshop on June 12, and a regular session with four speakers and a panel discussion which took place on June 14. In addition, the 2004 Teaching Excellence Award winner, Leo Jonker (Queen's) presented a luncheon address. The Education Sessions at the Winter Meeting in Montreal were organized by Leo Jonker. There were 10 talks over two days and the theme was "Mathematics for Future Teachers". A luncheon address was given by Jean-Marie de Koninck (Laval), the 2004 Adrien-Pouliot winner.

- The Chief Judge for the 2004 Canada Wide Science Fair in St. John's, Newfoundland was Don Bass (MUN) and the members of the judging team were Ivan Booth, Guy Quirion, and Colin Bartholomew.

  - Jessica Yu and Jimmy Xu of Toronto won the Canadian Mathematical Society Senior Award of $750 for their project, "Homeruns: Say it ain't so!"

  - Daniel Bezdek of Calgary won the Junior Award of $250.00 for his project, "Durer's Unsolved Geometry Problem".

  - Andrey Prjibelski, also of Toronto, won the Intermediate Award of $500 for, "Investigation of Ordering Process".

- The Education Committee Chair is one of the referees for the Math in Moscow competition. The winner selected for the 2005 Winter semester was Simon Belzile (UQAM).

- In the 2003 Annual Report, we expressed optimism that we would have changes to suggest for education materials on the CMS web site. Harley Weston brought forward suggestions at the 2004 Winter Meeting. There was considerable discussion on the website and ideas for future changes, such as links to the websites for the Education Fora, Ed Barbeau's education column in *CMS Notes*, and material on math education courses. We also hoped for the creation of a national mathematics educators group or association, and it seems that the activity surrounding the 2005 Forum is helping this cause. The Education Committee congratulates the organizers for their efforts on this front. In the coming year, we plan to continue the practice of arranging themes for the education sessions to follow up on themes brought forward at the Education Fora.

This is my last report as chair of the committee as it will now come under the leadership of Harley Weston.

ELECTRONIC SERVICES COMMITTEE

David L. Rogers, University of Michigan

The main accomplishments of the *Electronic Services Committee* for 2004 were:

Publishing Office:

- ***MathSciNet*** links to ***CMS on-line journals*** (Journal, Bulletin) went into production in May, 2004
- Revised format for on-line *CMS Notes*, limited to just PDF and Postscript formats, went into production with the October 2004 issue. This has eliminated significantly the manual labour previously required for each issue
- Pre-publication pages for the Bulletin and Journal are back on-line
- Significant progress was made toward dynamic generation of Journal and Bulletin pages

Web Services Office:

- Planned and started to launch service offerings for ***Statistical Society of Canada***, a new fee-for-service revenue stream that will leverage CMS information technology infrastructure
- Implemented content management system environment to manage meetings information more efficiently and with an improved user interface
- Developed significant system administration and website enhancements (e.g., digital certificate, secure transmissions, secure mail submissions, data import/export)
- Continues to make significant progress on daily issues, web content, infrastructure, and projects
- Continues to aggressively monitor and implement better spam solutions
- Continues to be managed by the *resource allocation scheme* introduced last year, with some rebalancing and adjustments dictated by events and experience
- Continues developing an optimal staffing model that properly recognizes *mix of work* and *resource constraints*

Executive Office:

- Developed a model for producing proceedings for ICM 2010
- Unanimously passed motion to offer additional *electronic* (only) subscriptions to CMS journals at 60% (40% discount) to remote sites (i.e., different geographical location) of existing institutional subscribers and the policy change was recommended to the Executive Committee
- Redesign of the CMS web site is underway

There was continued discussion on long-term strategies for ***e-Commerce*** and ***Digitization*** and agreement to make them central themes for 2005 *Electronic Services Committee* meetings.

The Committee thanked Tomasz Kaczynski and Eric Woolgar for their completed terms of service to the *Electronic Services Committee* and welcomed George Peschke as a new member.

ENDOWMENT GRANTS COMMITTEE

Thomas J. Ransford, Laval - Chair (to June 2004) and Karl Dilcher, Dalhousie, NS - Chair (from July 2004).

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

The committee was allocated $25,000 for the 2004 competition. Ten applications were received. Five of these were funded and the total allocated amount was awarded. All applicants have been notified by the CMS Executive Office in Ottawa.

The successful applications were as follows:

- a French-language interactive website, based in Moncton, with mathematical problems at varying levels for high-school students;
- a mathematics competition in Saskatchewan for students in grades 8-10;
- a contest for Ontario high-school students, to promote the investigation and presentation of mathematics using computers;
- based on a successful annual Math Fair in Alberta, to promote the concept across Canada and hold demonstration fairs in other provinces; and
- providing travel grants to female graduate students to attend a workshop on Connecting Women in Mathematics Across Canada, at the BIRS in July, 2005.

More details on the successful applications can be found on the CMS website: **`www.cms.math.ca/Grants/EGC/`**

Reports on projects funded in the past can also be found at this site.

Although the stock market has somewhat recovered, the overall financial situation of the CMS will require a reduced competition for 2005.

It was decided at the meeting of the CMS Board of Directors in December, 2004, that a minimum amount of $10,000 be allocated from the Endowment Fund for the 2005 Endowment Grants Competition, with the final amount to be set in April, 2005.

FINANCE COMMITTEE

Akbar Rhemtulla, University of Alberta

The Finance Committee advises the Board of Directors of CMS on general financial policies and oversees, in accordance with the

policies determined by the Board, the financial activities of the Society including the annual budget, the Restricted Investment Funds, the Endowment Fund, the Mathematical Olympiad Fund and Designated Activities Fund. The Committee includes among its members the Treasurer, the Executive Director, the President and the Past President or the President Elect of CMS. Dr. James Mingo joined the Committee as a new member this year. The committee meets twice a year, in April and October, to discuss the budget and make recommendations on financial matters.

As of November 2004, the total amount in the CMS Restricted Investments Funds was just over $1,650,000 Canadian. These are invested in various indexed funds managed by Toronto Dominion Quantitative Capital. The mix of the fund weightings is re-considered from time to time. The present allocations are approximately 50% in global equity funds, 10% in Canadian Equity funds and 40% in Canadian Bonds, a quarter of which is in real return bonds.

The Society is in the process of establishing a true Endowment Fund using a significant portion of the money presently in the Restricted Investment Fund. It is anticipated that this will facilitate the Society's fund raising activities.

Due to the drop in the US dollar (most of the revenue from books and journals are in US dollars), a drop in journal subscription numbers and the low interest rate, there is less money available for our activities and it was necessary to accept an Operations Fund deficit. In addition, due to the annual income from the Restricted Investment Fund being reduced, the amount allocated for the Endowment Grants Competition was reduced.

INTERNATIONAL AFFAIRS COMMITTEE

Jonathan Borwein, Dalhousie University, NS

The International Affairs Committee is in the process of reorganizing itself so as to be better able to discharge its dual roles as the international arm of the CMS and as the Canadian National Commission for the International Mathematical Union and ICSU through the National Research Council, the Canadian adhering organization.

Present activities for the Committee are preparing for the Madrid International Congress in 2006 and the Canadian bids for the International Congress in Montreal in 2010 and the International Congress for Industrial and Applied Mathematics in Vancouver in 2011.

MATHEMATICAL COMPETITIONS COMMITTEE

Peter Cass, University of Western Ontario

Introduction

The Mathematical Competitions Committee (MCC) is responsible for overseeing activities associated with the Society's involvement in mathematics contests. Two contests, the Canadian Open Mathematics Challenge (COMC) and the Canadian Mathematical Olympiad (CMO) are sponsored and run by the Society. The MCC is also responsible for Canada's participation in the International Mathematical Olympiad (IMO). Other activities of the MCC include the Mathematical Olympiads' Correspondence Programme.

Much of the work of the MCC is done by its three subcommittees (the Canadian Open Mathematics Challenge Committee, the Canadian Mathematical Olympiad Committee, and the International Mathematical Olympiad Committee) and the Correspondence Coordinator. Further information, including press releases, on most of the topics in this report can be found through the CMS Competitions web page **www.cms.math.ca/Competitions/** and at **www.cms.math.ca/MediaReleases/**.

The Canadian Mathematical Olympiad

The 36th Canadian Mathematical Olympiad (CMO) was written on March 31, 2004. A total of 79 students from 51 schools in nine Canadian provinces were invited to write the 2004 CMO; one student elected not to participate. The number of contestants from each province was as follows:
BC (12), AB (9), SK (1), MB (3), ON (45), QC (4), NB (1), NS (2), NF (1).

The **top winners** in the 35th Canadian Mathematical Olympiad were:

FIRST PRIZE and the Sun Life Financial Cup went to **Yufei Zhao**, Don Mills Collegiate Institute, Toronto, Ontario. **SECOND PRIZE** went to **Jacob Tsimerman**, University of Toronto Schools, Toronto, Ontario. **THIRD PRIZE** went to **Dong Uk (David) Rhee** McNally High School Edmonton, Alberta. **HONORABLE MENTIONS** were awarded to: **Boris Braverman** Simon Fraser Junior High, Calgary, Alberta; **Dennis Chuang** Strathcona-Tweedsmuir School, Okotoks, Alberta; **Gabriel Gauthier-Shalom** Marianopolis College, Montreal, Quebec; **Oleg Ivrii**, Don Mills Collegiate Institute, Don Mills, Ontario; **János Kramár** University of Toronto Schools, Toronto, Ontario; **Andrew Mao** A. B. Lucas Secondary School, London, Ontario; **Richard Peng** Vaughan Road Academy, Toronto, Ontario; **Peng Shi** Sir John A. MacDonald Collegiate Institute, Agincourt, Ontario.

A detailed report on the 2004 CMO, including the contest paper, solutions to the problems and the graders' reports is available at:
www.cms.math.ca/Competitions/CM0/

The Asian Pacific Mathematics Olympiad

In March 2004 the 16th Asian Pacific Mathematics Olympiad (APMO) was written. The top Canadian student was **Jacob Tsimerman** who won a gold medal, **János Kramár** was second and won a silver medal, **Peng Shi, Michael Lipnowski, David Rhee, John Sun,** and **Yufei Zhao** all won bronze medals, and **Oleg Ivrii, Yin Zhao** and **Allen Zhang** won Honorable Mention. In total, 39 Canadian students participated.

In 2005 the APMO will be written on Monday, March 14, afternoon and Tuesday, March 15, morning. Korea is running the APMO in 2005 and for the next 2 years.

Further details regarding the 2004 APMO are available at:

www.cms.math.ca/Competions/APMO/

The International Mathematical Olympiad

The 2004 International Mathematical Olympiad was very successful for Canada. The following is quoted from the press release of July 16, 2004.

"Canadian obtains a prefect score and wins a gold medal at the 2004 International Mathematical Olympiad in Athens, Greece."

Approximately 500 students competed at the 45th International Mathematical Olympiad (IMO). Only 45 were awarded Gold Medals of which an exceptional group of four students achieved a perfect score (42 out of 42). "This year a Canadian student, **Jacob Tsimerman,** achieved this rare honor and can be considered world champion", said Dr. Christopher Small, Canadian Team Leader.

Competing against students from 84 other countries, Canadian high school students have done extremely well, winning one Gold Medal, three Bronze Medals and two Honorable Mentions at the 45th International Mathematical Olympiad (IMO), Athens, Greece from July 4 -18, 2004.

The six students who competed for Canada were: **Oleg Ivrii**, Don Mills Collegiate Institute, Toronto (Ontario); **János Kramár**, University of Toronto Schools, Toronto (Ontario); **Dong Uk (David) Rhee**, McNally High School, Edmonton (Alberta); **Peng Shi**, Sir John A. MacDonald Collegiate Institute, Toronto (Ontario); **Jacob Tsimerman**, University of Toronto Schools, Toronto (Ontario); and **Yufei Zhao**, Don Mills Collegiate Institute, Toronto (Ontario).

The team was accompanied by the Team Leader, Dr. Christopher Small (University of Waterloo), the Deputy Team Leader, Dr. Edward Wang (Wilfrid Laurier University), and the Observer, Professor Felix Recio (University of Toronto).

Further details are available at:
www.cms.math.ca/MediaReleases/2004/imores.html

IMO Training Seminars

Two training seminars are held each year to prepare students for the annual IMO. The Winter Training Seminar was held in January at York University and begun the training for the IMO and to enabled the team leaders to meet those students who had a good chance of making the IMO team. The Summer IMO Training Seminar was held in June at UQAM and provided the intensive training for the members of the 2004 IMO team.

Mathematical Olympiads' Correspondence Programme

The Mathematical Olympiads' Correspondence Programme (MOCP) is a problems based correspondence programme. It is intended for Canadian or permanent resident high school students with exceptional mathematical ability who wish to pursue mathematical problem solving at a high level or who have ambitions to compete in Mathematical Olympiads. Dr. Edward Barbeau has been Coordinator of this programme for many years.

Further details are available at
www.cms.math.ca/Competions/MOCP/

The **National Math Camp** is designed primarily for younger Canadian students with at least two years remaining in high school and with the potential to compete at the mathematical Olympiad level. Participation in the National Camp is by invitation only. In 2004, students from grades 8 to 10 were invited. The initial selection was made from the results in the Canadian Open Mathematics Challenge and the remaining students were selected on their results in the Galois Contest, a competition organized by the Centre for Education in Mathematics and Computing. Other contest information, and recommendations from Regional Math Camp directors were also considered. Normally, at most two students from a particular school are invited. The National Math Camp was held at The University of Western Ontario from June 5-12, 2004. The National Camps have been organized and run by Tom Griffiths, Marlene Griffiths, and Richard Hoshino for the past several years. The CMS is indebted to them for all their help with the past National Camps.

The Canadian Open Mathematics Challenge (COMC)

The COMC is a contest written every year at the end of November. The Open provides mathematical enrichment for a large number of students and serves as a qualifying paper for the Canadian Mathematical Olympiad (CMO). The results are also used in the selection of students for the Winter Training Seminar and for the National Math Camp held in the summer.

Further details can be obtained at: **www.cms.math.ca/Competitions/COMC/**

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

NOMINATING COMMITTEE

Line Baribeau, Laval

One of the main tasks for the Nominating Committee in 2004 was to find candidates for the President and Vice-Presidents for the 2005 election. The committee also found new chairs and members for the

- Education Committee
- Electronic Services Committee
- Mathematical Competitions Committee
- Publications Committee
- Research Committee
- Student Committee
- Women in Math Committee

The Committee tried hard to maintain regional balance for the various committees. As of December 2004, there were still a few committee vacancies that required to be filled in early 2005.

OBITUARY

RICHARD BLUM
SEPTEMBER 26, 1913 - NOVEMBER 22, 2004

Richard Blum was born in Cernauti in Rumania on September 26, 1913 where he attended school and University, obtaining his Licentiate there in 1933. He continued his post-graduate studies at Cernauti under Prof. P. Vranceanu and at Paris with Prof. Elie Cartan, obtaining his Ph.D. with Vranceanu at the University of Bucharest in 1946. Following the war he and his wife Martha spent some time in Israel before emigrating to Canada in 1951. He taught high school in Dartmouth, Nova Scotia and then was a member of the Department of Mathematics at Acadia University in Wolfville from 1953 to 1954.

I had the privilege of knowing Richard for fifty years beginning in the summer of 1954. He and I were Fellows of the Summer Research Institute at Queen's University and Richard began his appointment at the University of Saskatchewan that fall. In the course of his tenure at Saskatoon until he retired in 1982 he became well known and highly respected by mathematicians in Canada and abroad, by members of the University community at Saskatoon and by a very large group of citizens in Saskatoon. His competency in Riemannian geometry (some wit said Rumanian geometry) and related areas of mathematics was at a very high level. His rich background in mathematics and European culture generally made him and Martha the life of every party and authorities on many a topic of conversation from science to art, music, history, etc. Much of their knowledge was first hand arising from studies and travels in Rumania, France and Germany including desperate times during the war when Rumania was overrun by both Germany and Russia and mere survival was a major accomplishment. He possessed high standards, respect for others, humility, and a level of integrity seldom found. The comments made at his memorial service bore out the high esteem people had for him. It was a privilege to know him and be able to call him a friend. A memorial fund in his name has been established at the University of Saskatchewan.

Garth H.M. Thomas

ANSWERS TO BRAIN TEASERS P. 12.

(1) BARBARIAN & ABERRATION.

(2) One is black and six are green. One 'lazy' way of 'seeing' this is to entertain the idea that if all the olives are green except one, the chances of her removing the black one among the first seven must be the same as the chances of her removing it among the second seven, i.e., 50-50.

CALENDAR OF EVENTS / CALENDRIER DES ÉVÉNEMENTS

APRIL 2005 AVRIL

1-2 The Sixth Annual Colloquiumfest, Research Unit Algebra and Logic (University of Saskatchewan, Saskatoon, SK)
http://math.usask.ca/~marshall/collfest.html

6-10 Extracting Macroscopic Information from Molecular Dynamics (CRM, Montreal, Quebec) **crm@ere.umontreal.ca**

27-May 1 Multiscale Modelling in Solids (CRM, Montreal, Quebec)
crm@ere.umontreal.ca

MAY 2005 MAI

2-6 Workshop on Gravitational Aspects of String Theory (Fields Institute, Toronto, ON) **abrand@fields.utoronto.ca**

6-8 **2005 Canadian Mathematics Education Forum, University of Toronto / Forum canadian 2005 sur l'enseignement des mathématiques**
www.cms.math.ca/events/CMEF2005

6-9 43rd Annual Cornell Topology Festival (Ithaca, NY)
www.math.cornell.edu/~festival/

11-14 MITACS 6th Annual Conference, Mathematics of Energy (University of Calgary, Calgary, AB) **www.mitacs.ca/AC2005/**

13-14 6th Mississippi State-UAB Conference on Differential Equations & Computational Simulations; Dedicated to Louis Nirenberg's 80th birthday and Klaus Schmitt's 65th birthday (Mississippi State University, Mississippi State, MS)
www.msstate.edu/dept/math/de2005/

13-15 Frontiers in Applied and Computational Mathematics, All Areas of Applied Mathematics (New Jersey Institute of Technology, Newark, New Jersey, USA).
suttons@adm.njit.edu; www.math.njit.edu/Events/FACM05/

14-15 Conference in honor of Heydar Radjavi's 70th Birthday (Hotel Golf, Bled, Slovenia) **Damjana.Kokol@FMF.Uni-Lj.SI, www.law05.si/hrc/**

15-21 43rd International Symposium on Functional Equations (Batz-sur-Mer, France)
Nicole.Belluot@ec-nantes.fr, romanger@us.edu.pl

16-20 Spring School/ École de printemp: Mini-invasive Procedures in Medicine and Surgery: Mathematical and computational Challenges/ Traitements mini-invasifs en médecine et chirurgie : défis mathématiques et numériques
www.crm.umontreal.ca/Med05/

22-25 ICCS 2005: International Conference on Computational Science, Advancing Science through Computation (Atlanta, GA)
Iccs2005@mathcs.emory.edu

23-27 Workshop/ Atelier: Mini-invasive Procedures in Medicine and Surgery: Mathematical and computational Challenges/ Traitements mini-invasifs en médecine et chirurgie : défis mathématiques et numériques **www.crm.umontreal.ca/Dimension05/**

26-31 3rd Annual Workshop in General and Geometric Topology Nipissing University (North Bay, Ontario, Canada) **http://www.nipissingu.ca/topology/workshop2005/may2005.html**

27-31 Annual meeting of the Canadian Mathematics Education Study Group - Ottawa University / Rencontre annuelle du Groupe canadien d'études en didactique des mathématiques - Université d'Ottawa **www.gcedm.math.ca**

31-Jun 3 Spring 2005 Wasatch Topology Conference (Park City, Utah)
www.math.utah.edu/wtc/

31-Jun 4 2nd Conference on Analysis and Probability on Fractals (Cornell University, Ithaca, N.Y.) **www.math.cornell.edu/Colloquia/fractals.html**

JUNE 2005 JUIN

1-5 Stochastic Modelling in Financial Mathematics (CRM, Montreal, Quebec)
crm@ere.umontreal.ca

3-5 **CMS/CSHPM Summer 2005 Meeting / Réunion d'été 2005 de la SMC/SCHPM (University of Waterloo)**
www.cms.math.ca/events/summer05

7-17 Fields Institute Summer School on Operator Algebras (University of Ottawa, Ottawa, ON) **www.fields.utoronto.ca/programs/scientific/04-05/opalg_school/**

9-10 Southern Ontario Matrices and Statistics Days (University of Windsor, Windsor, Ontario) **seahmed@uwindsor.ca**

10-12 Groups, Rings and Algebras, a Conference in honour of Donald S. Passman (University of Wisconsin, Madison, WI)
http://condor.depaul.edu/~chin/dsp.htm

19-24 Canadian Operator Theory Symposium dedicated to George Elliott's 60th birthday (University of Ottawa, Ottawa, ON)
www.fields.utoronto.ca/programs/scientific/04-05/COSy/

19-July 8 Random Processes, random matrices and integrable systems (CRM short program) Centre de recherches mathematiques, Universite de Montreal, Montreal, Quebec) **crm@ere.umontreal.ca**

20-Jul 15 Clay Mathematics Institute Summer School: Ricci Flow, 3-Manifolds and Geometry (including Perelman's recent work) (MSRI, Berkeley, CA)
www.claymath.org/summerschool

26-29 12th International Linear Algebra Society Conference
(Regina Inn Hotel, Regina,SA) **www.math.uregina.ca/~ilas2005/ ilas2005@math.uregina.ca**

27-Jul 5 Probability and Mathematical Physics (CRM, Montreal, Quebec)
www.crm.montral.ca/Number 2005/

JULY 2005 JUILLET

4-7 The 6th Iberoamerican Conference on Topology and its Applications, CITA 2005 (Puebla, Mexico) **http://docencia.izt.uam.mx/cita**

4-8 Eighth International Symposium on Generalized Convexity and Monotonicity (Insubria University, Varese, Italy) **www.eco.uninsubria.it/gcm8**

4-8 Conference on Universal Algebra and Lattice Theory (University of Szeged, Hungary) **www.math.u-szeged.hu/conf/algebra**

10-13 The 20th Summer Conference on Toplogy and its Applications (Denison University, Granville, OH) **sumtopo2005@denison.edu**

11-15 Novi Sad Algebraic Conference 2005 (University of Novi Sad, Serbia/Serbia and Montenegro) **www.im.ns.ac.yu/events/NSAC05/default/**

11-16 Strings 2005, Toronto (University of Toronto, ON)
abrand@fields.utoronto.ca

11-22 SMS 2005-NATO Advanced Summer Institute: Equidistribution in Number Theory **www.dms.umontreal.ca/sms/index.html; belanger@dms.umontreal.ca**

15-18 HPCS 2005: New HPC Culture in Canada, The 19th Annual Symposium on High Performance Computing Systems and Applications (University of Guelph, Guelph, ON) **www.scharcnet.ca/events/hpcs2005/**

15-21 ICMI Study15; The Professional Education and Development of Teachers of Mathematics (Aguas de Lindoia, Sao Paulo, Brazil) **dball@umich.edu**

CALENDAR OF EVENTS / CALENDRIER DES ÉVÉNEMENTS

JUNE 2005 JUIN

18-22 VI Brazilian Workshop on Continuous Optimization (West Side Hotel Residence, Goiania, Brazil) vibwco@mat.ufg.br

25-30 International Conference on Difference Equations, Special Functions and Applications (Munich, Germany) www-m6.ma.tum.de/~ruffing/Conference2005/

31-Aug 5 Bridges: Mathematica Connections in Art, Music and Science (The Banff Centre, Banff, AB) www.sckans.edu/~bridges/, rsaranghi@towson.edu

AUGUST 2005 AOÛT

7-12 High-dimensional PDE in Science and Engineering (CRM, Montreal, Quebec) www.crm.montreal.ca/Number 2005/

17-21 Third Pacific Rim Conference on Mathematics, All Areas of Mathematics (Fudan University, Shanghai, China). clzhou@fudan.edu.cn www.prcm3.fudan.edu.cn/

SEPTEMBER 2005 SEPTEMBRE

26-30 49th Annual meeting of the Australian Mathematical Society (The University of Western Australia, Perth) www.maths.uwa.edu.au/~austms05/

13-17 5th International Conference on Words (CRM, Montreal, Quebec) www.crm.montreal.ca/Number 2005/

OCTOBER 2005 OCTOBRE

17 - 21 Nonlinear parabolic Problems (Helsinki, Finland) www.math.helsinki.fi/research/FMSvisitor0506

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