



CMS NOTES de la SMC

FROM THE PRESIDENT'S DESK

Tom Salisbury
York University, Toronto

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Renewing the Society: This month's issue contains a copy of the President's lengthy annual report. So this column will be short, and will focus on a single critical issue, that of bringing new members to the CMS.

The CMS's ability to carry out its broad portfolio of projects and services depends crucially upon the work and financial support of volunteers across the country (and abroad). To sustain these efforts, it is vital that we engage and recruit the cohort of young faculty and recent graduates that our universities and colleges have been actively hiring over the last few years.

If you are not a CMS member, I urge you to join the Society and to volunteer for some of our committees or projects. If you are already a member, I urge you to talk to your new (and old) colleagues about also joining. Please think of inviting a member of the CMS Executive Committee or Board of Directors to address a meeting of your department or organization about the work of the CMS. With that in mind here are, in order of importance:

Six Reasons I should be a CMS member:

1. *I benefit from the CMS's advocacy to government, industry and the media on behalf of mathematics.*

For example, the CMS attempts to both increase the total funding available for mathematics, and to ensure that funding policies (e.g., those of NSERC) deal fairly with the needs of mathematics.

2. *I benefit from the infrastructure the CMS provides.* For example: our meetings, our journals, our electronic services. If your department advertises conferences or academic jobs in Canada, chances are you use our listserv cmath to do so. If not, you should.

3. *I want to support the educational projects the CMS takes on.* For example: Mathematics competitions, Math Camps, Math education fora. Through these projects mathematicians play an important role in improving the mathematical education of school age students, and in encouraging talented students to study mathematics further.

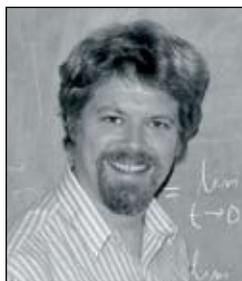
4. *I want to build a network of friends and future collaborators* by participating in CMS meetings and activities. Professional service, or the organization of sessions at meetings are a great way to meet interesting people. And they look good in a tenure file, too.

5. *The benefits of membership.* For example: the CMS Notes or meeting and publication discounts. New members can join for two years at half-price. CMS members get a discount on reciprocal membership in the *American Mathematical Society* or the *Mathematical Association of America*.

6. *My membership dues can be reimbursed from my NSERC grant.* This is a relatively new policy. While not in itself a justification for joining, at least it makes joining easier once you are convinced by the other reasons.

Valid as all these points are, they are not the real reason you should join the CMS. In fact, rather than asking what CMS membership can do for you, many of us view joining and supporting the CMS as a responsibility - something everyone should do who genuinely seeks to advance the cause of mathematics in Canada.

In advancing that cause, the CMS is committed to working with all components of our community and with our partners, such as the research institutes, MITACS, and provincial associations. We will continue to build bridges to our sister disciplines and their professional societies. Together we will succeed in ensuring a healthy future for Canadian mathematics.



Change of Season

For most of the last seven months, the rhythms of most of our lives were dominated by the week. One Monday would have much the same classes, or seminars, or meetings, as another; Tuesdays would resemble other Tuesdays, and so on through to the weekend. Hopefully somewhere we would find some time for research and relaxation as well.

But now the last lectures are over, extra-help sessions and exams coming up. The rhythm is changing, from a steady seven-beat time to a looser, more flowing one. Time will soon be available for research projects and travel. And this is the last issue of the *NOTES* until September.

By the time you read this, graduation will be nearly upon us. Students to whom we taught first-year calculus will be lining up, dressed better than we ever saw them in the 8:30 lecture, crossing the stage, accepting their diplomas - and leaving. We will see some of them again as graduate students; others will have ended their formal education and be going on to put it to use. And in September another group of freshmen will be filling the seats in Calc I, beginning their own four-year cycle of university.

And there are still longer rhythms in this composition; rhythms that is hard to take in all at once. Colleagues, who guided us when we first started to teach, retire; the younger colleagues whom we helped hire are tenured, promoted and become as apparently permanent elements of the department as those whose sometime offices they now inhabit used to be. Our workplaces change: computers and data projectors seem as inevitable a part of our classrooms as chalk boards used to. The Internet has changed the way some of us do mathematics, and the way all of us communicate it.

Let me take this opportunity to wish all of our readers a restful and productive summer, and to offer special good wishes to all those for whom this season marks a larger change, whether graduation, a much-needed sabbatical, or retirement.

Éditorial : Changement de saison

Depuis environ sept mois, nous vivons le plus souvent au rythme des semaines. Les lundis, nous avons généralement les mêmes cours, les mêmes séminaires ou les mêmes réunions; les mardis ressemblent à tous les mardis, et ainsi de suite, jusqu'à la fin de semaine. Nous espérons tous trouver un peu de temps pour la recherche ou le repos dans cette routine.

Mais, maintenant que les derniers cours sont donnés, que les séances de rattrapage sont bouclées et que les examens sont à nos portes, ce tempo régulier de sept jours devient plus souple, mois saccadé. Nous aurons bientôt le loisir de nous consacrer à nos projets de recherche ou de voyager. Et ce numéro des *Notes* est le dernier avant septembre.

Au moment où vous lirez ces lignes, les collations des grades seront pratiquement terminées. Ces étudiants à qui nous avons enseigné le calcul en première année seront alignés en coulisse, mieux vêtus que nous ne les avons jamais vus à leurs cours de 8 h 30, ils traverseront l'estrade pour recevoir leur diplôme et poursuivront leur chemin. Nous reverrons certains d'entre eux au deuxième cycle, d'autres auront terminé leurs études et iront mettre leurs connaissances à profit. En septembre, un nouveau groupe

d'étudiants entreprendront à leur tour leur premier cycle universitaire et viendront prendre leur place dans le cours de Calcul 101.

Cette grande composition comprend d'autres rythmes encore plus à long terme, des rythmes difficiles à suivre tous en même temps. Ces collègues qui nous ont guidés à nos premières années d'enseignement prennent leur retraite; les jeunes collègues que nous avons embauchés obtiennent leur permanence ou une promotion, et deviennent des éléments permanents du département, tout comme ceux et celles dont ils occupent désormais les bureaux. Nos lieux de travail changent: ordinateurs et vidéoprojecteurs sont maintenant des éléments tout aussi indispensables que l'étaient pour nous le tableau et la craie. Pour certains d'entre nous, Internet a changé notre façon de faire des mathématiques, et pour chacun de nous, notre façon de les transmettre.

Permettez-moi de vous souhaiter, chers lecteurs, un été à la fois reposant et productif, et d'offrir mes meilleurs vœux à tous ceux et celles pour qui la fin de cette saison est une étape marquante, que ce soit la fin des études, une année sabbatique bien méritée ou la retraite.

NOTES DE LA SMC

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CMS NOTES

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RÉDACTEURS EN CHEF

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

EDITORS-IN-CHIEF

Robert Dawson, Srinivasa Swaminathan
notes-editors@cms.math.ca

RÉDACTEURS-GÉRANT

Graham P. Wright
gpwright@smc.math.ca

MANAGING EDITOR

Graham P. Wright
gpwright@cms.math.ca

RÉDACTION

Éducation : Edward Barbeau
notes-education@smc.math.ca
Réunions : Gertrud Jeewanjee
notes-reunions@smc.math.ca
Critiques littéraires: Peter Fillmore
notes-redacteurs@smc.math.ca
Recherche : Vacant
notes-recherche@smc.math.ca
Assistante à la rédaction :
Susan Latreille

CONTRIBUTING EDITORS

Education: Edward Barbeau
notes-education@cms.math.ca
Book Reviews: Peter Fillmore
notes-reviews@cms.math.ca
Meetings: Gertrud Jeewanjee
notes-reunions@cms.math.ca
Research: Vacant
notes-research@cms.math.ca
Editorial Assistant:
Susan Latreille

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

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Canadian Mathematical Society - Société mathématique du Canada
577 King Edward, Ottawa, Ontario, Canada K1N 6N5

T: (613) 562-5702 F: (613) 565-1539

notes-articles@smc.math.ca

www.smc.math.ca www.cms.math.ca

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Divine Proportions: Rational Trigonometry to Universal Geometry

by N. J. Wildberger

Wild Egg, Sydney 2005 xx + 300 pp \$79.95 Aus

I have on my shelves a book entitled “The Elliptic Functions As They Should Be”. The author, Albert Eagle, writing in the 1950’s, spent almost five hundred pages redoing the theory of elliptic functions using what he believed to be the right notation. Just about every function was redefined to standardize the periods and renamed; even where functions were left unchanged the notation was often switched to the author’s preferred form; $\log_{10}(x)$ became $\text{loc}(x)$, the factorial sign preceded its argument, and $\pi/2$ ingeniously became τ . Sadly but unsurprisingly, this never caught on.

Others have attempted to get the human race to replace base 10 with base 12 in daily use, to make English spelling phonetic, or to get everybody to speak Esperanto. In each case, the proposal had merit in the abstract; but the weight of tradition predictably kept the balance tipped firmly in its original direction. The book under review has something of the same quixotic spirit.

It attempts nothing less than a radical reinvention of trigonometry and geometry. The concepts of length and angle measure are replaced respectively by *quadrance* (length squared) and *spread* (the square of the sine of the angle). In addition to the spread, we have also the *cross* (which is 1 minus the spread) and the *twist*, the ratio of the spread to the cross. The significance of the initial letters will become evident on a moment’s thought!

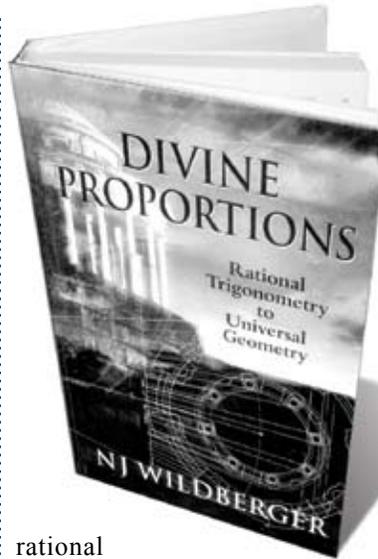
The author, a Canadian with a doctorate from Yale, now teaching in Australia, makes a reasonable case that many trigonometric calculations are simplified by this novel choice of variables. Pythagoras’ Theorem is obviously simpler in this form; the sine law is replaced by the “spread law”

$$\frac{s_1}{Q_1} = \frac{s_2}{Q_2} = \frac{s_3}{Q_3};$$

and so on. At one level this is simply the strategy, often taught to calculus students and problem solving contestants, of “working with the squares” to avoid the use of square roots. A triangle with rational vertices will have edges with rational quadrance and angles with rational spread, cross, and twist. This is certainly a good thing; we are reminded of the convenience, in some circumstances, of working with the slope rather than with the angle in civil engineering, construction, plumbing, etc., although Wildberger’s proposal goes much deeper.

We may also detect a similarity to the use of variance in statistics. On the one hand, standard deviation is a more concrete measure of how much a population fails to be concentrated at one point; in particular, it is dimensionally equivalent to the original data (and to any reasonable location statistic). On the other hand, for theoretical purposes, it is much easier to work with variance, which is additive when the sources are independent. The whole idea of ANOVA is based on this idea that variance can be broken up into different components, adding up to the whole, and attributable to different sources.

Another parallel situation arises in classical mechanics. The



rational
qu a n t u m

moment of inertia of a body about an arbitrary point can be expressed as the sum of its moment of inertia about its own center of gravity, and the moment of inertia of a point mass at the center of gravity. Statisticians and physicists use some of the same algebraic tricks to simplify their calculations.

Wildberger’s approach would seem to allow the same bag of tricks to be applied to geometry. (It could be interesting to see trigonometry applied to mechanics or special relativity!)

For certain very specialized sorts of numerical computation, rational trigonometry might be enormously simpler. In particular, programmers wishing to use exact arithmetic may find that being able to stay within the rational numbers rather than having to use an unwieldy tree-based data type representing constructible numbers justifies complications elsewhere. Wildberger also points out that rational trigonometry generalizes directly and transparently to geometries over finite fields; I think this is an exciting idea. In such cases, it is possible that the explicit use of quadrance and spread might actually be worthwhile.

However, in other situations it would seem that the cost is higher and the benefit lower. For instance, rational trigonometry seriously obscures the link between trigonometry and periodic functions. To work with electronics, differential equations, complex numbers, and many other things we absolutely require sinusoidal functions; spread and quadrance are not an adequate substitute. As we cannot then avoid introducing the tools of classical trigonometry, even at the high school level, the advantages of introducing a second set of foundations as well seem dubious. Finally, not every irrational number that arises in trigonometry can be avoided in this way; the trisection of the angle is a case in point.

From the point of view of classical Euclidean geometry, rational trigonometry at first seems positively obstructive. The fact that distance is additive along lines is crucially important to Euclidean geometry, as is the fact that angle is additive around an arc. The concepts of translational, reflectional, and rotational symmetry all spring from these facts; and it would seem at first glance that nothing could justify obscuring this additivity. However, I was surprised how readily the author manages to achieve a wide range of classical results, including the eyeball theorem, the theorems of Menelaus and Ceva, and results on the Euler line and nine-point circle. These proofs are similar in complexity to those in standard texts - and in some cases a little easier, though where there is a real advantage to working with the square of the length standard texts often do so too. Moreover, as mentioned above, they generalize in a transparent way to geometries over finite fields. The discussion of constructibility of regular polygons in finite fields, in chapter 14, is particularly nice.

Why was this book written? The first few chapters give a hint. The author claims a strong philosophical aversion to the fields of real numbers and what he unfortunately terms “decimal numbers”. These (page 23) he apparently identifies with the computable real numbers - although (page 22) he claims the field to be complete and not countable. These views will not, as the author admits, be shared by many; nor do they force the approach that he has chosen, as exact arithmetic with algebraic numbers may be carried out formally and rigorously under more or less any axiom system. Fortunately, the rest of the book stands independently of these shaky foundations (as mathematics often does).

For the most part this book is clear and logical; one could almost imagine it as a standard undergraduate textbook from an alternate universe in which mathematical conventions had developed differently. Reading it gives an interesting illustration of how mathematics is, and is not, shaped by mathematicians (or “social construction” if you prefer). More practically, I would recommend the book as serious reading for anybody who teaches classical or (especially) finite geometry. Computational geometers may find the author’s approach extremely useful for certain purposes. But, ultimately, I do not expect rational trigonometry to replace the more usual approach.

NEWS FROM THE FIELDS INSTITUTE

May 11-12, 2007, “Workshop on Global Optimization: Methods and Applications”, Fields Institute
www.fields.utoronto.ca/programs/scientific/06-07/globalopt/

May 25-26, 2007, “Ottawa-Carleton Discrete Mathematics Workshop”, Carleton University
www.fields.utoronto.ca/programs/scientific/06-07/discrete_math/

May 28-June 1, 2007, “Seventh Canadian Summer School on Quantum Information”, University of Waterloo
<http://www.iqc.ca/quantumworld/index.php?id=2&pid=15>

May 28-31, 2007, “Canadian Discrete and Algorithmic Mathematics Conference (CANADAM 2007)”, Banff Conference Center, Alberta
<http://www.cs.ualberta.ca/%7Emreza/CANADAM/>

May 31-June 2, 2007, “Lattices and Trajectories: A Symposium of Mathematical Chemistry in honour of Ray Kapral and Stu Whittington”, Fields Institute
www.fields.utoronto.ca/programs/scientific/06-07/lattices/

June 1-3, 2007, “16th International Workshop on Matrices and Statistics”, University of Windsor
<http://www.uwindsor.ca/iwms>

June 5-8, 2007, “Probability and Stochastic Processes Symposium in Honour of Donald A. Dawson’s work”, Carleton University
www.fields.utoronto.ca/programs/scientific/06-07/stochastic/

June 5-9, 2007, “35th Canadian Operator Symposium(COSy)”, University of Guelph
www.fields.utoronto.ca/programs/scientific/06-07/COSy/

June 18-23, 2007, “Conference on Combinatorics and Optimization”, University of Waterloo
www.fields.utoronto.ca/programs/scientific/06-07/CO40/

June 27-29, 2007, “Randomization of Quantum Systems Workshop Institute for Quantum Computing”, University of Waterloo
www.iqc.ca/quantumworld/index.php?id=4

July 7, 2007, “Future Directions of Computational and Mathematical Neuroscience”, Fields Institute
www.fields.utoronto.ca/programs/scientific/07-08/neuroscience/

July 16 - 20, 2007, “Workshop on Noncommutative Dynamics and Applications”, Fields Institute
www.fields.utoronto.ca/programs/scientific/07-08/operator_algebras/

July 18-21, 2007, “CUMC 2007 Canadian Undergraduate Mathematics Conference”, Simon Fraser University
<http://cumc.math.ca/2007/en/>

July 25-28, 2007, “Symbolic-Numeric Computation (SNC’07) and Parallel

Symbolic Computation ‘07 (PASCO ‘07)”, University of Western Ontario
www.orcca.on.ca/conferences/pasco2007/site/
www.orcca.on.ca/conferences/snc2007/site/

July 27, 2007, “Brain Biomechanics: Mathematical Modelling of Hydrocephalus and Syringomyelia Centre for Mathematical Medicine at the Fields Institute”
www.fields.utoronto.ca/programs/scientific/CMM/07-08/biomechanics/

July 29-August 1, 2007, “International Symposium on Symbolic and Algebraic Computation (ISSAC2007)”, University of Waterloo
<http://www.cs.uwaterloo.ca/%7Eissac07/>

August 12-16, 2007, “2nd International Conference on Continuous Optimization ICCOPT - MOPTA07”, McMaster University
<http://iccopt-mopta.mcmaster.ca/>

August 13-17, 2007, “6th International Conference on Unconventional Computation”, Queen’s University
www.cs.queensu.ca/uc07/

August 13-24, 2007, “Summer School on Operator Algebras”, University of Ottawa
www.fields.utoronto.ca/programs/scientific/07-08/opalg_school/

August 27-29, 2007, “Automata 2007, 13th International Workshop on Cellular Automata”, Fields Institute
www.fields.utoronto.ca/programs/scientific/07-08/automata07/

September 4-7, 2007, “Data Assimilation Workshop”, Fields Institute
www.fields.utoronto.ca/programs/scientific/07-08/data_assim/

September 17 - 21, 2007, “Workshop on Free Probability, Random Matrices, and Planar Algebras”, Fields Institute
www.fields.utoronto.ca/programs/scientific/07-08/operator_algebras/free/

September 22-24, 2007, “Geometrization of Probability Workshop”, University of Ottawa
www.fields.utoronto.ca/programs/scientific/07-08/geometrization/

October 29 - November 2, 2007, “Workshop on von Neumann Algebras”
www.fields.utoronto.ca/programs/scientific/07-08/operator_algebras/

November 9-10, 2007, “Conference in Honour of the 60th birthday of Professor Andreas R. Blass”, Fields Institute
www.fields.utoronto.ca/programs/scientific/07-08/blassconference/

November 12- 16, 2007, “Workshop on Structure of C^* -Algebras”
www.fields.utoronto.ca/programs/scientific/07-08/operator_algebras/

December 11 - 15, 2007, “Workshop on Operator Spaces and Quantum Groups”
www.fields.utoronto.ca/programs/scientific/07-08/operator_algebras/

Collected Papers of Leo Moser

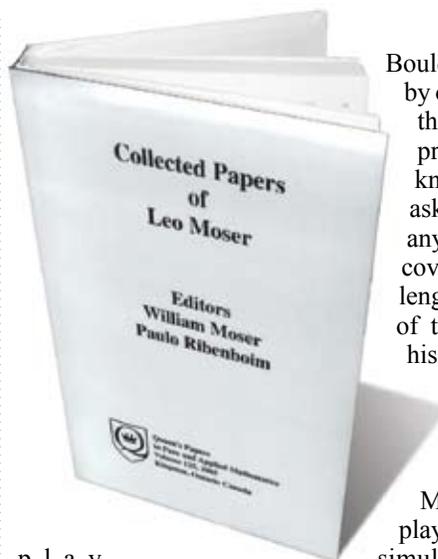
*Edited by William Moser and Paulo Ribenboim
Queen's Papers in Pure and Applied Mathematics
Volume 125, 2005, Kingston, ON
xxvi + 649 pp*

Leo Moser was born in Vienna on April 11, 1921. He and his parents emigrated to Canada in 1924. He received a B.Sc. from the University of Manitoba in 1943, an M.A. from the University of Toronto in 1944, and a Ph.D. from the University of North Carolina in 1950; his Ph.D. supervisor was Alfred Brauer. After working for a year at Texas Technological College, he moved to the University of Alberta in 1951 where he remained the rest of his life. His heart had been damaged by rheumatic fever when he was a child, and in the fall of 1965 he received one of the first artificial heart valves in Canada; as he put it, his doctor had told him that without the operation he could expect to live only a few months and they would not be pleasant ones. A year later he suffered a stroke that affected his ability to recall names but not, as he liked to say, his ability to remember theorems. He recovered sufficiently to resume mathematical activity and to attend meetings. But on February 9, 1970 his heart failed, and he died.

Some years ago his brother, W.O.J. Moser, assembled copies of 86 of his papers and circulated them privately. The volume under review consists of this collection augmented by a preface by his brother, a reprint of an obituary by his friend and collaborator Max Wyman, and a list of his graduate students.

Moser's primary research interests were in number theory and combinatorial analysis. He published results on primes, quadratic residues, arithmetic functions, and additive number theory, for example, as well as results in graph theory and combinatorial or discrete geometry. Several of his number theory papers were written with J. Lambek. And he and Max Wyman wrote a series of joint papers in which they investigated the asymptotic behaviour of various numbers of types that arise in combinatorial problems; their results applied to the Stirling numbers, the Bell numbers, and the Ménage numbers, for example. Those who are fond of geometry might enjoy paper [2] [coincidentally sited on page 10 of the last issue of the *NOTES*. -Ed.] This is written in the form of a dialogue between a professor and a prospective student who is not convinced he needs to study calculus to work in mathematics. The professor describes a variety of standard and not-so-standard problems involving areas, volumes, arc lengths, optimization, etc., that most people would attack using calculus. But for each such problem, the student has a clever solution, often geometric in nature, that does not require any calculus. Wyman, in his obituary article, refers to the intuition, insight, and ingenuity displayed in Moser's work.

Moser's papers were not his only contribution to mathematics. He had a gift for posing and solving problems. In the ten years from 1947 to 1956, for example, he posed or solved more than 160 AMS Monthly problems. He was one of the people consulted in the preparation of the Otto Dunkel Memorial Problem Book that appeared as a Monthly supplement in 1957. And he was involved in setting some of the Putnam examinations. Some of his work was mentioned in Martin Gardner's columns and books; see, e.g., [3,4]. A list of unsolved problems he presented at a meeting in



Boulder in 1963 was expanded by others and ultimately led to the collection [1]. The worm problem is one of the best known of these problems: it asks for the smallest area of any set in the plane that can cover every open curve of length at most one. A version of the notes he prepared for his beginning graduate course in number theory is still available on the Internet.

Moser was a skilled chess player and would sometimes play simultaneous games against the members of chess clubs in schools. Perhaps it is not surprising that he thought the endgame was where he had his greatest strength.

Moser was instrumental in introducing a Ph.D. program in mathematics at the University of Alberta. When I arrived at the department in the fall of 1960, I was sent to his office. He offered to take me on as a student and told me I had a choice: I could write either a good thesis or a long one. A few weeks later he came to my office and asked what I was doing. Working on a problem set, I said, feeling rather pleased that he had found me working instead of reading magazines or gossiping with other students. But instead of being impressed, he seemed almost annoyed and asked me if I planned on doing problem sets all my life. Of course not. Well, then I should be doing research. I answered that I didn't know enough yet to do research. He replied that I never would, but that I should start doing some anyway. And so I did. That was the best advice he ever gave me.

Moser was a humorous and entertaining lecturer; he went on two lecture tours for the MAA. He enjoyed telling stories about mathematicians—especially about Hardy and Erdős, his mathematical heroes. He did not try to dominate the conversation in small groups, but he could be relied upon to find something witty to say in response to most situations. Frank Harary once told me he had attended a lecture by the leader of a polar expedition who had stated that every expedition needed someone with a good sense of humour to help relieve stress and boredom. Harary said that Moser filled such a role amongst his acquaintances.

Moser was interested in the work that other mathematicians and their students were doing. Upon returning from a trip to Toronto, he told me he had learned that Tutte had a student, Will Brown, who was so good that not only could he read Tutte's papers (on enumerating certain types of graphs), he could apply Tutte's methods to obtain new results of his own. When Moser returned from his first MAA lecture tour he told me of a promising—mainly self-taught—student, David Klarner, he had met in California. He was so impressed that he said that if Klarner should claim to have a proof of Fermat's Last Theorem he, Moser, would look at the argument. This was high praise indeed.

continued page 10

Letters to the Editors Lettres aux Rédacteurs

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

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

WANTED: Books for Review RECHERCHÉS : Livres pour critiques littéraires

Have you written a book lately?

Would you like to see it reviewed in the *CMS Notes*? If so, please arrange to have a review copy sent to our Book Review Editor.

Vous avez récemment écrit un livre? Vous aimeriez une critiques littéraires de celui-ci dans les *Notes de la SMC*? Si oui, veuillez faire parvenir une copie au rédacteur des critiques littéraires.

Peter Fillmore
Department of Mathematics and Statistics
Dalhousie University
Halifax NS B3H 3J5

CALL FOR NEWS FROM THE 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 deadline indicated at the back of this issue. Our intention is to circulate this reminder at least once per term and to run this column in all 8 issues (Sep, Oct, Nov, Dec, Feb, Mar, Apr, May).

We hope that departments will submit news at least once per term. Thank you for your cooperation.

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, date):
- Other News:

AMERICAN MATHEMATICAL SOCIETY


New Releases from the AMS



Hyperbolic Partial Differential Equations
Peter D. Lax, *New York University, Courant Institute, NY*
with an appendix by Cathleen S. Morawetz

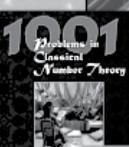
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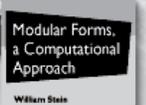
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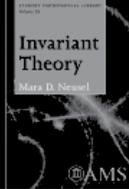
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Certain Number-Theoretic Episodes in Algebra

by R. Sivaramakrishnan

Chapman & Hall/CRC 2006 632 pp \$139.95 US

The author's stated goal is to justify the assertion that "it is desirable to learn algebra via number theory and number theory via algebra". Part I of the book, consisting of some 200 pages, presents the elements of number theory and algebra. Topics covered include the classic theorems of Euler, Fermat and Lagrange, the Chinese remainder theorem and reciprocity laws, as well as integral and Euclidean domains, rings of polynomials and finite groups. In Part II the relevance of algebraic structures in number theory is examined, including ordered fields, the Möbius function, generating functions and convolution algebras. Part III deals with Noetherian and Dedekind domains and algebraic number fields, and the concluding Part IV presents some additional interconnections between algebra and number theory. Each of the 16 chapters ends with a set of exercises and chapter references. At the end of the book there are indices of theorems, notation, subjects, and names, as well as a bibliography.

Yearning for the Impossible: The Surprising Truths of Mathematics

by John Stillwell

A. K. Peters 2006, xiii + 229 pp

There are many instances of apparent impossibilities that are important to mathematics. Many mathematicians have taken note of this phenomenon and commented on it. For example, Phil Davis writes in *The Mathematics of Matrices* (1965) that each extension of the notion of number that have been made over a period of 2500 years overcame, in its own way, a contradictory set of demands. Mathematical language is littered with pejorative and mystical terms - such as irrational, imaginary, surd, transcendental - that were once used to ridicule the supposedly impossible objects. A. N. Kolmogorov says that "at any given moment there is only a fine layer between the 'trivial' and the impossible. Mathematical discoveries are made in that layer."

Thus mathematics may be described as a story of close encounters with the impossible because all great discoveries are close to the impossible. The aim of this book is to tell this story, briefly and with few prerequisites, by presenting some representative encounters across the breadth of mathematics. Textbooks and research papers omit encounters with the impossible and introduce new ideas without mentioning the confusion that were intended to be cleared up. But one has to experience some of the confusions in order to see the need for new and strange ideas.

The chapter headings are: The Irrational, The Imaginary, The Horizon, The Infinitesimal, Curved Space, The Fourth Dimension, The Ideal, The Periodic Space, The Infinite. Readers with a good mathematical background from high school would enjoy reading this book. They would learn many interesting facts such as, for example, the impossible figure of the Penrose tribar is actually not

impossible. It does not exist in ordinary space because it contains a triangle with three right angles. In the penultimate chapter it is shown that the tribar exists in some other three-dimensional space, called a 3-cylinder space, and that the search for a tribar-friendly world leads to a variety of periodic spaces.

Suitable references are given at the end of the book so that a reader can pursue the study of the attractive ideas presented in the book

Google's PageRank and Beyond: The Science of Search Engine Rankings

by Amy N. Langille and Carl D. Meyer

Princeton 2006 234pp \$35 US

The authors state their purpose as follows: "As teachers of linear algebra, we wanted to write a book to help students and the general public appreciate and understand one of the most exciting applications of linear algebra today - the use of link analysis by web search engines....we also wanted this book to be a single source for material on web search engine [page] rankings." The first three chapters introduce web search and link analysis, and are aimed at the general reader. Chapter four, "The Mathematics of Google's PageRank", begins with a system of linear equations expressing the rank of each page in terms of the ranks of all the pages pointing to it. This leads to the "Google matrix", a stochastic matrix of size equal to the total number of pages (now more than 8 billion), of which the desired pagerank vector is an eigenvector. Subsequent chapters explore the details of this computation and look at other ranking methods. A chapter is devoted to the future of web information retrieval, including the problem of spammers who for a price will undertake to improve the ranking of your page. A final chapter, of some 50 pages, contains the mathematics needed to understand the text. There is a glossary of technical terms, a bibliography of 165 items, and a six-page index. A noteworthy feature of the book is the extensive series of "asides"-entertaining stories, tips, quotes, and the like.

USA and International Mathematical Olympiads 2005

Edited by Zuming Feng, Melanie Matchett Wood, and Cecil Rousseau

MAA 2006, xvi + 80 pp

This little book contains problems, with hints, and formal solutions, that were set for the USAMO contest 2005. In addition to presenting their own carefully written solutions to the problems, Zuming and Melanie provide remarkable solutions developed by the examination committees, contestants, and experts, during or after the contests. Detailed reports of results and comprehensive guide to other materials that emphasize advanced problem-solving are also given. The Introduction provides valuable advice to students for attempting the problems. The book will be useful to students who wish to develop their interest in mathematics outside the school curriculum and to deepen their mathematical knowledge.

Problems and how to solve them.

For many years, mathematics educators looked askance at competitions because of their apparent elitism and the discouragement they offered to regular students. This debate has largely become a thing of the past, as competitions have become much more varied and broadly based. For example, the Canadian Mathematical Society has reached out to many school students through its Canadian Open Mathematics Challenge, which is currently written by over 6000 students across the country. In order to cater to this wider audience, teachers and mathematicians have had to come up with problems that cannot be too difficult, while at the same time are interesting, unusual, challenging and not dependent on a lot of background.

Unfortunately, many textbooks and a great deal of the educational literature take no account of the vast stock of such material that is now available, settling instead for material that is hackneyed and trite. Mathematics texts and courses at the tertiary level for non-specialist students often fare little better. However, many books have come out recently that are intended to help teachers coach problem solvers, or to instruct students directly and provide examples for them to chew away at. It is my purpose this month to examine some of these.

The first book seems to be a publication of the author himself, a teacher of secondary mathematics for forty years at the Experimental School of the University of Athens. He spent time as a Fulbright Scholar at the Learning Research and Development Center of Pittsburgh University, and refined his methods through discussions with such investigators as J. Greeno, H. Simon and W. Wickelgren. The author's address is 22 Kapodistriou St., 152 36 N. Penteli, Athens, Greece and email address is spyrosap@otenat.gr.

Spyros Kalomitsines, *New methods of problem solving and a model for teaching mathematics*.

Athens, Greece, 2006 ISBN: 960-631-567-3

The promise of "new methods" is a little extravagant although the author makes some useful points and provides many examples. He rightly points out that the difficulties faced by students not only result from the problems, but also from their own mental state. "Unjustified phobias, indecision in generating ideas, blockage of mind, loops in thought; all these obstacle intermingle and do not allow our mind to make its best efforts."

The author tries to be prescriptive, starting first with the "description method" in which solvers are encouraged to write out everything that comes to mind about the problem situation, the "method of getting out of loops" in which the solver tries to avoid ruts by recording attempts and articulating alternatives and the "spiral method" of systematically going through various approaches. While a lot of good, albeit standard, advice is given, the treatment is uneven and often a problem is given and solved with little discussion at all. This is particularly true of the chapter on calculus problems. The problems themselves vary from those that are meaty to fairly standard exercises, some evidently intended for examination preparation.

For senior secondary and tertiary students, probably the most systematic and efficient book on problem solving is

Paul Zeitz, *The art and craft of problem solving*.
John Wiley, 1999 ISBN: 0-471-13571-2

This is carefully and tightly written; the author does not promise the reader a protocol for solving any problem that comes along, but, through many examples, leads the reader to an understanding of the proper state of mind. Part of this is to be open to and appreciative of the work of other solvers, in other words, to build up experience. There is a clear division into two parts, the first dealing with general strategies, mathematical tactics (symmetry, the extreme principle, the pigeonhole principle, invariants) and fundamental background (graph theory, complex numbers, generating functions), and the second covering individual topics, algebra, combinatorics, number theory and calculus. This is an excellent book for Putnam training.

Zeitz, in company with my next author, emphasizes that the only real way to learn to solve problems is to dive in. The role of a book is to organize material, identify themes and encourage the reader by orchestrating the problems so that there is something accessible to start with. This is the approach of

Steven G. Krantz, *Techniques of problem solving*.

American Mathematical Society, 1997, rep. 1999 ISBN 0-8218-0619-X (with separate solution manual by Luis Fernandez and Haedeh Gooransarab American Mathematical Society, 1997 ISBN 0-8218-0628-9)

Each chapter works up from exercises, often covering standard theory, to more challenging material; the problems in the body of the chapter are following by their solutions, and each chapter concludes with a list of unsolved problems for which a solutions manual is available. There is a lot of familiar material here, such as magic squares, balance problems, river-crossing problems. A number of themes are treated: counting, parity, logic, geometry, probability, recreations, algebra and analysis, probability, statistics and fallacies. This is a good resource for anyone asked to visit a school or give a light undergraduate talk.

For someone giving a college course in problem solving wanting a book that collects up problems, old and new, in a wide variety of topics, it is hard to beat

Martin J. Erickson, Joe Flowers, *Principles of mathematical problem solving*.

Prentice-Hall, 1999 ISBN: 0-13-096445-X

There are twenty short chapters, each consisting of a few worked examples with a minimum of general advice, a section of problems followed by solutions and a concluding list of additional problems without solutions, some drawn from olympiads, the Putnam or problems sections of journals. The opening chapters categorize according to strategies, such as contradiction, induction, symmetry, parity and pigeonhole, while the latter part of the book covers different areas, such as algebra of polynomials, recurrence relations and generating functions, optimization, inequalities, summation and analysis. An unusual but commendable chapter treats problems of estimation, for example

$$\int_{-1}^1 (1-x^2)^n dx \sim \sqrt{\frac{\pi}{n}}$$

as $n \rightarrow \infty$. In the last two chapters, the reader is thrown to the wolves. In the penultimate chapter, entitled “*Deus ex machina*”, the authors point out that “the solutions imply elements not explicit in the problem statements” that are often “surprising” and whose identification requires creativity.

If you are looking for a book for personal enjoyment, then it is not a bad idea to go for one that consciously reflects the predilections of its writer. Such a book is

Paul R. Halmos, *Problems for mathematicians young and old*.
Mathematical Association of America, 1991 ISBN 0-88385-320-5

As the author states, the book “consists of some of the many problems that I started saving and treasuring a long time ago.” The aficionado will recognize many of them, but will nonetheless appreciate the commentary. The problems are at the beginning of the book sorted into fourteen chapters, covering combinatorics, calculus, puzzles, numbers, geometry, tilings, probability, analysis, matrices, algebra, sets, spaces, mappings, measures. Then follow about twenty pages of hints, and finally the solutions.

If the Halmos book is reminiscent of the famous Problems and theorems of analysis by George Polya and Gabor Szego, even more so is

Paulo Ney de Souza, Jorge-Nuno Silva, *Berkeley problems in mathematics, third edition*
Springer, 2004 ISBN 0-387-00892-6/0-387-20429-6

This is directed to undergraduates, especially to those harbouring graduate school ambitions. Since 1977, the Mathematics Department of the University of California at Berkeley has required its students to write examinations over a two-day period in which they tackled 6 or 7 problems out of a list of 9 or 10. So far, about 1000 problems have been used. These are collected into seven chapters (real analysis, multivariable calculus, differential equations, metric spaces, complex analysis, algebra and linear algebra), problems listed first and the solutions given separately. The best comparator from an earlier era is probably the Cambridge Tripos problems.

Also at the tertiary level is

Gábor J. Székely (editor), *Contests in higher mathematics*
Springer, 1996 ISBN 0-387-94588-1

This contains the problems of the Miklós Schweitzer Competitions in Hungary from 1962-1991. This contest dates back to 1949 and is named in honour of a talented young mathematician who never was admitted to college and died during the Second World War. The problems “reflect the interests of [prominent Hungarian] mathematicians and some aspects of the mainstream of Hungarian mathematics. The problems are presented chronologically, as they appeared on the contests, but the solutions are given according to topic, each section prepared by a different mathematician. This is heavy-duty stuff!

At a lower level, for the Olympiad-class secondary student, we have

Arthur Engel, *Problem-solving strategies*.
Springer, 1997 ISBN 0-387-98219-1

from a highly-respected problemist with a long history of involvement in the International Mathematical Olympiad. As with other books mentioned, the early chapters treat general principles that cut across mathematical areas, turning to subject-specific problems later in the book. Each chapter opens with worked examples to illustrate the main concepts and procedures, then presents a number of problems, most along with their solutions. All told there are about 1200 problems, many from national and international competitions.

In a much lighter vein, for those interested in pure recreation, the next trio of authors have provided a collection of problems that has something for any mathematically-interested person above the age of ten. Many of them are combinatorial or numerical, and almost none of them require school techniques.

Paul Vaderlind, Richard Guy, Loren Larson, *The inquisitive problem solver*
Mathematical Association of America, 2002 ISBN 0-88385-806-1

Any account of the aesthetics of problems and their solutions would not be complete without reference to the books by Ross Honsberger published by the Mathematical Association of America. He is an inveterate collector of beautiful examples, and is well known for the mathematical concerts he gave for many years at the annual meetings of the Ontario Association for Mathematics Education and more recently at the annual Waterloo contest marking bees every April. I will just mention a recent example *Mathematical delights*, published in 2004 by the MAA (ISBN 088385-334-5), in which he collects problems and solutions from a variety of publications and other sources.

Tony Gardiner of the School of Mathematics at the University of Birmingham in England has quite successfully used his books as didactic tools to engage students in problem solving. His ambition to make mathematics widely accessible to young people led to his increasing involvement in the competitions in the United Kingdom and his study of how students might be successful in their mathematical adventures. His technique is to begin with a problem or sequence of problems, encourage the student to have a crack at it, and then break it down into smaller parts and encourage the student to observe and account for what they see.

A. Gardiner, *Discovering mathematics: the art of investigation*.
Oxford University Press, 1987 ISBN 0-19-853265-2/0-19-853282-2

A. Gardiner, *Mathematical puzzling*.
Oxford, 1987; UK Mathematics Foundation, 1996 ISBN 0-7044-17545

A. Gardiner, *The Mathematical Olympiad Handbook: an introduction to problem solving*.
Oxford University Press, 1997 ISBN 0-19-850105-6

The Canadian Mathematical Society itself has become a major source of problems material, and readers should be sure to explore

its website www.cms.math.ca. The CMS publishes the problems journal *Crux Mathematicorum with Mathematical MAYHEM*, the problems and solutions of the Canadian Mathematical Olympiad, the ATOM (*A Taste of Mathematics*) series and, on its website, the *International Mathematical Talent Search* and the *Mathematical Olympiads Correspondence Program*.

In a completely different vein, I offer some bedtime reading. The author started his career in Italian Studies and is currently professor of semiotics and anthropology at the University of Toronto, as

well as director of the program in semiotics and communication. However, he has an abiding interest in mathematics and has written a number of popular books. His thesis is that human beings have a characteristic penchant for puzzles that cuts across all cultures and ages. Successive chapters treat puzzles of language, pictures, logic, numbers and games.

Marcel Danesi, *The puzzle instinct: the meaning of puzzles in human life*.

Indiana University Press, 2002 ISBN 0-253-34094-2

BOOK REVIEW: HE LIVED LONG ENOUGH TO DO IMPORTANT WORK *continued*

He thought highly of the work of Nathan Mendelsohn and said he would rank him among the top three Canadian mathematicians (of the time). I asked him who the other one was. He smiled and replied that the general consensus was that Coxeter was the leading Canadian mathematician.

Moser told me the following story when he became a Fellow of the Royal Society of Canada. Once upon a time there were two applicants for a mathematics position at a certain Canadian university—a Professor X, FRS, and a Professor Y, FRSC. The hiring committee offered the position to Professor Y because he had more letters after his name.

When Moser first arrived at Alberta, before there was a separate Faculty Club building, there was a room in the Administration Building that served as a Staff Dining Room. Once when he went there for lunch he, quite innocently, sat down to eat at a table that certain members of the higher administrative orders regarded as reserved for themselves. One of them asked Moser who he was. On being told, the administrator replied, “You’re only a professor here, aren’t you?”

Moser was persuaded to serve as interim department head briefly on two occasions, but he did not enjoy administrative work. He was, however, willing to acknowledge that some of it was necessary, and he told me we should be grateful that there were people like Max Wyman who had an aptitude for it and were willing to do it.

He took a certain amount of interest in current events, if only because they provided a fertile source of material for comments; but his intellectual interests seemed to be concentrated on mathematics—with chess and puzzles in the nature of hobbies. I once asked him if he ever read anything non-mathematical, such as novels. He laughed and said the last novel he had read was *The Prisoner of Zenda*, and my impression was that this reading had taken place a long time before.

Underneath his fondness for jokes and clever remarks, there was a thoughtful and considerate side. After his heart valve operation, he shared a hospital room with another man who died after a few days. In spite of the brevity of their acquaintance, he wrote a letter of consolation to the man’s son. When a student from Alberta

encountered a disappointment at another university, Moser wrote him a sympathetic letter of encouragement and said that he himself had had a somewhat similar experience. And when he learned that a certain graduate student was having a hard time financially, he offered to help him. (I learned of these incidents indirectly, not from Moser himself.)

I would not presume to predict Moser’s place in history. But at a session in memory of Erdős at the AMS Meeting in San Diego in 1997, Richard Guy made a remark about Moser’s work with Erdős that applies to his work in general: that although Moser did not live long, he lived long enough to do important work.

References

- [1] P. Brass, W. O. J. Moser, and J. Pach, *Research Problems in Discrete Geometry*, Springer, New York, 2005.
- [2] J. H. Butchard and L. Moser, *No Calculus Please*, *Scripta Mathematica* 18 (1952) 221-236.
- [3] M. Gardner, *Mathematical Games*, *Scientific American* 215 (1966) 264-272 and 231(1974) 120-125.
- [4] M. Gardner, *More Nontransitive Paradoxes*, Chapter 23 in *The Colossal Book of Mathematics*, Norton, New York, 2001.

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www.cms.math.ca/forms/member

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CMS Winter 2007 Meeting / Réunion d'hiver 2007

Hôtel Hilton Hotel
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Host / Hôte : University of Western Ontario

Meeting Director
Dr. J.F. Jardine (UWO)

Local Arrangements
Dr. David Riley (UWO)

Plenary Speakers

Conférenciers Pléniers

Erich Kaltofen (North Carolina State)
Mikhail Kapranov (Yale)
Blaine Lawson (SUNY/Stony Brook)
Seth Lloyd (MIT)
Matilde Marcolli (Max Planck)
Otmar Venjakob (Heidelberg)
Marcelo de Carvalho Borba (Sao Paulo at Rio Claro)

Prizes

Prix

Coxeter-James Prize – Vinayak Vastal (UBC)
Doctoral Prize
Adrien Pouliot Prize
G. de B. Robinson Award

Sessions

Algebraic Combinatorics, Representations and Geometry Combinatoire algébrique, représentations et géométrie

Org: Lex Renner (UWO)

Algebraic Stacks Champs algébriques

Org: Ajeet Dhillon (UWO)

Algorithmic Challenges in Polynomial and Linear Algebra Défis algorithmiques dans l'algèbre polynomiale et l'algèbre linéaire

Org: Stephen Watt (UWO)

Calculus of Variations in Physics, Geometry and Economics Calcul des variations, géométrie et économie

Org: Robert McCann (Toronto), Benjamin Stephens (Toronto)

Combinatorics and its Applications to Mathematical Physics Combinatoires et ses applications en physique mathématique

Org: Michael Gekhtman (Notre Dame), Michael Shapiro (Michigan State)

Complex Analytic Geometry Géométrie analytique complexe

Org: Tatyana Foth (UWO), Finnur Larusson (Adelaide), Rasul Shafikov (UWO)

Error Control Codes, Information Theory and Applied Cryptography

Codes de contrôle d'erreurs, théorie de l'information et cryptographie appliquée

Org: Aiden Bruen (Calgary), David Wehlau (Queen's and RMC)

Graph Theory

Théorie des graphes

Org: Stephen Kirkland (Regina), Sebastian Cioaba (UC-San Diego), Claude Tardif (RMC)

Homotopy Theory

Théorie de l'homotopie

Org: Kristine Bauer (Calgary)

Iwasawa Theory

Théorie d'Iwasawa

Org: Manfred Kolster, Romyar Sharifi (McMaster)

Mathematical Applications of Category Theory

Applications mathématiques de la théorie des catégories

Org: Walter Tholen (York), F. William Lawvere (SUNY-Buffalo)

Mathematical Imagination

Imagination mathématique

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Mathematics of Finance

Finance mathématique

Org: Matt Davison (UWO), Mark Reesor (UWO), Rogemar Mamon (UWO)

Non-Commutative Geometry

Géométrie non commutative

Org: Masoud Khalkhali (UWO)

Nonlinear Wave Equations and Applications

Équations d'ondes non linéaires et leurs applications

Org: Walter Craig (McMaster), Catherine Sulem (Toronto)

Quantum Information Theory in Quantum Gravity

Théorie de l'information quantique en gravité quantique

Org: David Kribs (Guelph), Fotini Markopoulou (Perimeter Institute)

Contributed Papers

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CALL FOR PROPOSALS - 2007 ENDOWMENT GRANTS COMPETITION

The Canadian Mathematical Society is pleased to announce the 2006 Endowment Grants Competition to fund projects that contribute to the broader good of the mathematical community. The Endowment Fund is used to fund such projects and the Endowment Grants Committee (EGC) administers the distribution of the grants and adjudicates proposals for projects. Depending on the performance of the CMS Endowment Fund, the funds available for this year's competition may be less than past years.

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

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

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

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

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

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

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

Application process. Application forms and templates as well as advice and directions are available at the CMS website www.cms.math.ca/Grants/EGC. Proposals must be received no later than September 30, 2007.

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

Dr. Karl Dilcher

Chair, Endowment Grants Committee

Canadian Mathematical Society

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Ottawa, ON K1N 6N5

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APPEL DE PROPOSITIONS - CONCOURS DE BOURSES DU FONDS DE DOTATION 2007

La Société mathématique du Canada (SMC) est heureuse d'annoncer la tenue du Concours de bourses du fond de dotation 2006 pour le financement d'activités qui contribuent à l'essor global de la communauté mathématique. Le Comité d'attribution des bourses du fonds de dotation (CABFD) se charge d'évaluer les propositions et d'attribuer les bourses. Selon le rendement du Fonds de dotation de la SMC, le financement disponible pour le concours de cette année pourrait être inférieur à celui des années précédentes.

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

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

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

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

Le CABFD évaluera les projets qui s'étalent sur un maximum de trois ans. Les projets s'échelonnant sur plusieurs années seront toutefois financés en fonction des fonds dont disposera le Comité l'année de la demande. Le Comité se limitera aux propositions dont le financement demandé n'excède pas 5 000 \$ par année.

De façon générale, le CABFD favorise les propositions où les fonds de la SMC peuvent être équilibrés ou les propositions qui ne disposent d'aucun organisme de financement naturel où postuler.

Si les demandeurs prévoient tirer une valeur financière durable du projet, ils doivent l'indiquer et expliquer leur intention envers cette valeur.

Processus de demande. Le formulaire de demande et gabarits, ainsi que conseils et instructions sont disponible au site de la SMC www.smc.math.ca/Grants/EGC/.f. Les applications doivent être reçues au plus tard le 30 septembre 2007.

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

Dr. Karl Dilcher

Président, Comité d'attribution des bourses du fonds de dotation

Société mathématique du Canada

577 King Edward

Ottawa, ON K1N 6N5

chair-egc@cms.math.ca

NSERC - CMS Math in Moscow Scholarships

The Natural Sciences and Engineering Research Council (NSERC) and the Canadian Mathematical Society (CMS) supports scholarships at \$9,000 each. Canadian students registered in a mathematics or computer science program are eligible.

The scholarships are to attend a semester at the small elite Moscow Independent University.

Math in Moscow Program

www.mccme.ru/mathinmoscow/

Application details

www.cms.math.ca/bulletins/Moscow_web/

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

Two scholarships will be awarded in the fall competition. Deadline **September 30, 2007** to attend the Winter 2008 semester



Bourse CMS/CRSNG Math à Moscou

Le Conseil de Recherches en Sciences Naturelles et en Génie du Canada (CRSNG) et la Société mathématique du Canada (SMC) offrent des bourses de 9,000 \$ chacune. Les étudiantes ou étudiants du Canada inscrit(e)s à un programme de mathématiques ou d'informatique sont éligibles.

Les bourses servent à financer un trimestre d'études à la petite université d'élite Moscow Independent University.

Programme Math à Moscou

www.mccme.ru/mathinmoscow/

Détails de soumission

www.cms.math.ca/bulletins/Moscou_web/

Pour plus de renseignements veuillez communiquer avec votre département ou la SMC au 613-562-5702.

Deux bourses seront attribuées au concours de d'automne. Date limite le **30 septembre 2007** pour le trimestre d'hiver 2008



The 2006 reports are in the language provided by the chair. All other reports appear in the April issue of the CMS Notes.

Les rapports sont livrés dans la langue de rédaction d'origine; les autres rapports paraissent dans le numéro d'avril des Notes de la SMC.

REPORT OF THE PRESIDENT AND THE ADVANCEMENT OF MATHEMATICS COMMITTEE

Thomas Salisbury (York University), President

Mathematics in 2006

Canada is home to a vibrant and flourishing mathematical community, in which the CMS plays a central role. Our meetings and publications form a key part of the fabric of Canadian mathematical research. As the national organization that represents our profession, the CMS speaks on behalf of mathematics to industry and government. Our Math Camps program for students and our outreach to teachers of mathematics make an important contribution to mathematics education in Canada. Our endowment grants program makes possible various mathematically based projects that would not exist otherwise. We are active in mathematics competitions at both the national and international level. Our prestigious prizes celebrate excellence in both research and teaching. The community is tied together through our newsletters and electronic services – for an example, just think of the reliance of the community on the Society's electronic infrastructure to publicize conferences, job ads, etc. Our success in all these arenas is due to the active engagement of a broad segment of Canadian mathematicians, and to the generosity of our supporters. The Society owes a debt of gratitude to all its volunteers and sponsors for their commitment to building and strengthening mathematics in Canada. The detailed descriptions of the year's CMS activities, to be found throughout the pages of this annual report, attest to the health of our discipline and to the energy of our members.

2006 was an exciting and eventful year for mathematics. The quadrennial International Congress of Mathematicians took place in Madrid, amidst the announcement of the Fields medals and the attention attracted by the solution of the Poincaré conjecture. As is well known, the Fields medals were originally a Canadian initiative, and the medals themselves continue to be fabricated here at the Royal Canadian Mint. Canada's efforts to bring a future ICM to Montreal were highlighted at a reception held in Madrid with the cooperation of the Canadian embassy there.

In 2011 Canada looks forward to hosting the International Congress of Applied and Industrial Mathematics, in Vancouver. 2006 also saw extended discussions between the Canadian

mathematical community and the Natural Sciences and Engineering Research Council, over the future funding for Canada's three internationally renowned mathematics research institutes. The CMS participated actively in an NSERC liaison committee (chaired by former CMS President Richard Kane) that weighed the alternatives and advocated for the stable and enhanced infrastructure needed to raise Canada's mathematical research to new heights. The attention and effort NSERC devoted to this whole process is a testament to the excellence of Canada's mathematics research institutes and of NSERC's recognition of their importance for our discipline.

Meetings and conferences

The reports of the Executive Director and research committees contain details about the two excellent society meetings held in 2006, in Calgary in June, and in Toronto in December. We look forward to visiting Winnipeg for the June 2007 meeting and London in December 2007. The Winnipeg meeting will be joint with MITACS, reflecting the Society's policy of fostering exchanges and collaborations with other societies and groups. In 2008, the CMS summer meeting will in fact be subsumed in a very large Canada-France congress, to be held in Montreal. Through this and other initiatives, we continue to showcase Canadian mathematics to the world.

The CMS has now established a relationship with the Sociedad Matemática Mexicana (SMM), with SMM Vice-president Fernando Brambila signing a formal agreement between the two societies at the December 2006 CMS meeting. In September 2006, the SMM had welcomed Canadian mathematicians to the Centro de Investigación en Matemáticas (CIMAT) in Guanajuato, for an extremely successful first joint meeting between the CMS and SMM. We look forward to reciprocating at a special meeting in 2009, to be organized at PIMS in Vancouver. Thanks are due to the SMM, and especially to UBC's Alejandro Adem for spearheading this initiative. In 2009 Vancouver will also play host to the next Canadian Mathematics Education Forum, organized by France Caron, Malgorzata Dubiel, and Peter Taylor.

Math in Moscow

This program provides a tremendous opportunity for gifted undergraduates to attend the Independent University of Moscow for a semester, with funding from the CMS and NSERC. In 2006 two scholarships were awarded, with a combined value of \$18,000.

Prizes

The society's prestigious scientific prizes (Coxeter-James,

¹ Reports referred to in the article have appeared in either the April or May 2007 issue of the CMS NOTES.

Jeffery-Williams, Krieger-Nelson, Doctoral) continue to recognize outstanding research contributions. Our education prizes (Adrien-Pouliot, Excellence in Teaching) draw national attention to that important aspect of our profession. Further details may be found in the reports of the Research and Education committees. The Publications Committee report describes our prize in that arena (G. de B. Robinson award).

This year the CMS inaugurated a new prize, the David Borwein Distinguished Career award. The first winner was Richard Kane (Western Ontario), who at the same time received the CMS Distinguished Service Award. We were pleased that David and Bessie Borwein were present at the presentation during the December 2006 CMS meeting, to unveil the beautiful bronze sculpture by Helaman Ferguson that goes to the winner. This work of art is inspired by a surface of negative curvature related to a conditionally convergent sequence arising from the work of David Borwein and his sons and colleagues.

The achievements recognized by the CMS prizes are truly outstanding. But this high standard relies on a continuing flow of excellent nominations. Please give serious consideration to nominating a deserving colleague.

Advancement of Mathematics

Since CMS journals are denominated (outside Canada) in US dollars, the current US exchange rate has had a noticeable impact on the Society's revenue. Fortunately, prudent management and active fundraising have managed to keep our deficit for 2006 under \$20,000. But it is clear that to continue to support the wide range of our educational programs, a professional fundraising capacity is essential. With the help of *Queen's Advancement External Services*, we have been building that capacity. In 2006, as part of that effort, the CMS hired Mark Bowman as Development Coordinator. An on-line donations site was constructed. The accounting for our endowed funds has been made more transparent, and responsibility for them given to an arms-length Invested Funds committee, to provide greater accountability to our donors. Already these efforts have borne some fruit, in the form of generous donations by individual members of the Society, new sponsors, and through renewed or enhanced support from some of the society's existing donors.

Both CMS meetings in 2006 were occasions at which we were able to recognize the commitment of long-time supporters of CMS educational activities. In June we acknowledged the significant role of the *Imperial Oil Foundation* in helping sustain our Math Camps program. In December we marked the 60th year of *Sun Life Financial's* support, a relation almost as old as the CMS itself. Sun Life helps ensure the continued health of our mathematics competitions, and awards the *Sun Life Financial Cup* annually to the first prize winner of the

CMO. Both our competitions and Math Camps programs make an important contribution to Canadian society, and we greatly appreciate the help of our donors in making them possible.

Milestones

The Calgary CMS meeting (and John Conway's talk in particular) was an occasion for celebrating the 90th birthday of Richard Guy. At the Toronto CMS meeting we marked the 80th birthday of long-time CMS Notes Editor-in-Chief S. Swaminathan.

A remarkable term of service ended when Arthur Sherk (Toronto) stepped down after 13 years as CMS Treasurer. Arthur served the society with integrity, care, and devotion. His reports - whether they consisted of good news or bad - were delivered with fairness and polite good humour. The Toronto CMS meeting offered a suitable occasion to celebrate his many contributions to the CMS. Arthur is succeeded by David Rodgers, who is by training a chemist, but has provided excellent leadership for the Society in the area of electronic services and publishing. In his new capacity as Treasurer, we will draw on that experience as well as his background in private business.

Challenges

As usual, the Executive Committee met four times in 2006; at the meetings of the Society, and again in April and October, at the Fields Institute. Among the issues considered were a move by the UK-based teachers' organization NATFHE to boycott Israeli academics. In response, the CMS posted a statement generally opposing such boycotts, and supporting "the principle that academic freedom of individuals should not be sacrificed in the pursuit of political agendas."

The Executive also considered the important issue of the recruitment of new members. The ability of the CMS to sustain its many initiatives relies on the efforts and commitment of a high fraction of the country's mathematical scientists. Efforts continue to be made to engage young mathematicians and new faculty in the work of the society.

Thanks

The society is extremely grateful to its many partners, sponsors, supporters, and volunteers - including meeting organizers, editors, committee members, and the champions of our targeted activities. Special thanks go to the staff of the CMS Executive and TeX Offices, whose excellent work makes our programs possible. I must particularly thank Graham Wright for his dedicated work on behalf of the Society, and for the generous help he gave both this year's presidents during 2006.

Finally I'd like to thank Eddy Campbell, whose term as CMS President ended in June 2006. His fairness, good sense, vision,

and enthusiasm have served the CMS well for a long time, but especially over the last two years as President. Among his many successes, I'll single out his response to falling publications revenue. While implementing cost savings, Eddy also realized that the real solution was to build an effective fundraising capacity within the CMS, and he led us promptly and effectively towards that goal. It was a great personal pleasure working with Eddy in 2006, and I'd like to express the Society's thanks to him for the superb job he has done.

RAPPORT DU PRÉSIDENT ET DU COMITÉ POUR L'AVANCEMENT DES MATHÉMATIQUES

Thomas Salisbury (Université York), Président

Les mathématiques en 2006

Le Canada est l'hôte d'une communauté mathématique dynamique et florissante, où la SMC joue un rôle central. Nos congrès et publications sont une composante essentielle du milieu de la recherche mathématique au pays. En tant qu'organisme national qui représente notre profession, la SMC se fait le porte-parole de la communauté mathématique auprès de l'industrie et des gouvernements. Nos camps mathématiques pour les élèves et nos activités à l'intention des enseignants de mathématiques contribuent grandement à l'essor de l'éducation mathématique au Canada. Notre programme de bourses du fonds de dotation permet la réalisation de projets mathématiques qui ne verraient pas le jour autrement. Nous organisons des concours mathématiques et y participons, tant sur la scène nationale qu'internationale. Nos prestigieux prix soulignent l'excellence en recherche et en enseignement. Nos bulletins et nos services électroniques assurent le maintien des liens au sein de la communauté – songez par exemple à l'importance de l'infrastructure électronique de la SMC pour publier des annonces de conférences ou de congrès ou des annonces d'emploi. Notre réussite dans tous ces domaines est attribuable à la participation active d'un grand nombre de mathématiciens canadiens et à la générosité de nos partenaires. La Société doit une fière chandelle à tous ses bénévoles et commanditaires pour leur engagement envers l'essor des mathématiques au Canada. La description détaillée des activités de cette année à la SMC, que vous lirez dans ce rapport annuel, témoigne de la vitalité de notre discipline et de l'énergie de nos membres.

L'année 2006 a été une année intense pour la communauté mathématique. Le Congrès international des mathématiciens (CIM), qui se tient tous les quatre ans, a eu lieu à Madrid cette année, au beau milieu de l'annonce des médailles Fields et de l'attention qu'a reçue la solution de la conjecture de Poincaré. Les médailles Fields, il est bien connu, étaient à l'origine une initiative canadienne, et les médailles sont toujours fabriquées ici à la Monnaie royale canadienne. Les efforts du Canada pour attirer un futur CIM à Montréal ont été soulignés lors d'une réception organisée à Madrid avec la collaboration de

l'ambassade canadienne en Espagne.

En 2011, le Canada accueillera le Congrès international de mathématiques appliquées et industrielles, à Vancouver. En 2006, la communauté mathématique canadienne et le Conseil de recherches en sciences naturelles et en génie (CRSNG) ont beaucoup discuté du financement futur des trois instituts de recherche canadiens, qui jouissent d'une solide réputation internationale. La SMC a participé activement au comité de liaison du CRSNG (présidé par Richard Kane, ancien président de la SMC) qui a étudié les options et a fait la promotion d'une infrastructure stable, mais améliorée, dont le Canada a besoin pour porter le niveau de la recherche mathématique canadienne vers de nouveaux sommets. L'attention et les efforts que le CRSNG a consacrés au processus prouvent l'excellence des instituts de recherche mathématique du Canada, et la reconnaissance de leur importance pour notre discipline par le CRSNG.

Congrès et conférences

Le rapport du directeur administratif et ceux des comités de la recherche¹ décrivent avec force détails les deux excellents congrès de la Société tenus en 2006, l'un à Calgary en juin, l'autre à Toronto en décembre. Nous nous réjouissons à l'idée de nous retrouver à Winnipeg pour le congrès de juin et à London pour celui de décembre 2007. Le congrès de Winnipeg sera organisé en collaboration avec le Réseau MITACS, conformément à la politique de la Société de favoriser les échanges et la collaboration avec d'autres sociétés ou groupes. En 2008, notre rendez-vous estival prendra la forme d'un très important congrès franco-canadien qui se tiendra à Montréal. Grâce à cette initiative et à bien d'autres, nous poursuivons nos efforts de promotion des mathématiques canadiennes à l'échelle mondiale.

La SMC a tissé des liens avec la Société mexicaine de mathématiques (SMM) grâce à une entente entre la SMC et la SMM, signée par le vice-président de la SMM, Fernando Brambilla, à la Réunion de la SMC de décembre 2006. En septembre 2006, la SMM avait accueilli les mathématiciens canadiens au Centro de Investigación en Matemáticas (CIMAT) à Guanajuato, à l'occasion d'un premier congrès conjoint très réussi entre la SMC et la SMM. Nous espérons accueillir les Mexicains à notre tour lors d'un congrès extraordinaire en 2009, qui sera organisé par le PIMS à Vancouver. Nous remercions sincèrement la SMM, et en particulier Alejandro Adem (UBC) d'avoir mené de front cette initiative. En 2009, Vancouver sera aussi l'hôte du prochain Forum canadien sur l'enseignement des mathématiques, qui sera organisé par France Caron, Malgorzata Dubiel et Peter Taylor.

¹ Rapports parus ou à paraître dans les *Notes de la SMC* d'avril ou de mai 2007.

Math à Moscou

Ce programme offre une occasion exceptionnelle à des étudiants doués du premier cycle universitaire d'étudier pendant un semestre à l'Université indépendante de Moscou, grâce au soutien financier de la SMC et du CRSNG. En 2006, deux bourses d'une valeur combinée de 18 000 \$ ont été attribuées.

Prix

Par ses prestigieux prix (*Coxeter-James*, *Jeffery-Williams*, *Krieger-Nelson*, *Doctorat*), la SMC continue de souligner les contributions exceptionnelles à la recherche. Nos prix d'éducation (*Adrien-Pouliot*, *Excellence en enseignement*) attirent l'attention sur la scène nationale vers cet important aspect de notre profession. Vous trouverez tous les détails dans le rapport du Comité de la recherche et du Comité d'éducation. Le rapport du Comité des publications décrit pour sa part notre prix dans le domaine des publications (*G. de B. Robinson*).

Cette année, la SMC a inauguré le *prix David-Borwein de mathématicien émérite pour l'ensemble d'une carrière*. Le premier lauréat de ce prix est Richard Kane (Western Ontario), qui a reçu par la même occasion le *Prix de la SMC pour service méritoire*. Nous sommes très heureux que David et Bessie Borwein aient pu assister à la remise du prix à la Réunion de décembre 2006 et dévoiler la magnifique sculpture de bronze réalisée par Helaman Ferguson attribuée au lauréat du prix David-Borwein. Cette œuvre d'art, inspirée des travaux de David Borwein, de ses fils et de ses collègues, représente une surface de courbure négative liée à une suite conditionnellement convergente.

Les réalisations soulignées par les prix de la SMC sont véritablement hors du commun. Pour maintenir ce niveau élevé, nous avons toutefois besoin d'un riche bassin de nominations. Nous vous incitons à proposer la candidature de collègues méritants.

Avancement des mathématiques

Comme les revues de la SMC se vendent en dollars US à l'extérieur du Canada, la faiblesse actuelle de la devise américaine a eu un effet marqué sur les revenus de la Société. Heureusement, une gestion prudente et des campagnes de financement dynamiques nous ont permis de conserver notre déficit sous les 20 000 \$ en 2006. Mais il est clair que pour continuer à soutenir notre vaste gamme de programmes éducatifs, nous avons besoin d'aide externe. Avec l'aide du service d'avancement externe de l'Université Queen's, nous sommes donné ces moyens. Dans cette optique, la SMC a embauché en 2006 Mark Bowman à titre de coordonnateur du développement. Nous avons en outre créé un site de don en ligne. Nous avons accru la transparence de la gestion financière de nos fonds de dotation et en avons confié la gestion à un Comité des investissements autonome, afin d'offrir à nos

donateurs une imputabilité supérieure. Ces efforts ont déjà porté leurs fruits, sous la forme de dons généreux offerts par des membres individuels de la Société, de nouveaux commanditaires et du soutien renouvelé ou accru de certains de nos donateurs actuels.

Les deux congrès de la SMC de 2006 nous ont permis de rendre hommage à l'engagement soutenu d'organisations qui appuient les activités éducatives de la SMC. En juin, nous avons souligné le rôle primordial de la Fondation Pétrolière Impériale dans le financement de notre programme de camps mathématiques. En décembre, nous avons souligné la 60^e année de soutien de la Sun Life envers la SMC, une relation presque aussi ancienne que la SMC elle-même. La Sun Life contribue à la vitalité de nos concours mathématiques et décerne tous les ans la Coupe Sun Life au grand gagnant de l'Olympiade mathématique du Canada. Nos programmes de concours et de camps mathématiques apportent beaucoup à la société canadienne, et nous apprécions énormément le soutien de nos donateurs à la réalisation de ces programmes.

Événements marquants

Le congrès de la SMC tenu à Calgary (et la conférence de John Conway en particulier) nous a permis de souligner le 90^e anniversaire de Richard Guy. Au congrès de Toronto, nous avons célébré le 80^e anniversaire de S. Swaminathan, rédacteur en chef des *Notes de la SMC* depuis de nombreuses années.

Après 13 années de loyaux services, Arthur Sherk (Toronto) a quitté la trésorerie de la SMC. Arthur a offert ses services à la Société avec intégrité, attention et dévouement. Qu'ils contiennent de bonnes ou de mauvaises nouvelles, ses rapports ont toujours été justes et empreints d'un humour poli. Nous avons souligné ses nombreuses contributions à la SMC au congrès de Toronto. Arthur laisse la place à David Rodgers, chimiste de formation, qui a guidé la SMC avec brio dans les dossiers des services et de la publication électroniques. À titre de trésorier, il bénéficiera sans doute de cette expérience, tout comme de ses années de travail dans le secteur privé.

Dossiers chauds

Comme d'habitude, le Comité exécutif s'est réuni à quatre reprises en 2006, soit à l'occasion des deux congrès de la Société ainsi qu'en avril et en octobre, à l'Institut Fields. Au nombre des dossiers sur lesquels le comité s'est penché, mentionnons le mouvement de boycottage des scientifiques israéliens lancé par une association d'enseignants du Royaume-Uni (NATFHE). En réaction à ce mouvement, la SMC a résolu de s'opposer de façon générale à de tels boycottages et « d'appuyer le principe selon lequel la liberté des scientifiques ne doit pas être sacrifiée au profit de visées politiques ».

Le Comité exécutif a aussi étudié l'importante question du

recrutement de nouveaux membres. La capacité de la SMC de poursuivre ses nombreuses activités repose sur le travail et l'engagement d'une forte proportion des mathématiciens du pays. Nous poursuivons nos efforts pour intéresser les jeunes mathématiciens et les nouveaux professeurs au travail de la Société.

Remerciements

La Société est extrêmement reconnaissante envers ses nombreux partenaires, commanditaires et bénévoles, notamment les organisateurs de congrès, rédacteurs, membres de comités et maîtres d'œuvre de nos activités ciblées. Je remercie tout spécialement le personnel du bureau administratif et du Centre de rédaction TEX de la SMC, dont le travail extraordinaire assure la continuité de nos programmes. Je dois remercier en particulier Graham Wright de son dévouement envers la Société ainsi que de son aide précieuse et de sa grande générosité envers les deux présidents en 2006.

Enfin, j'adresse mes sincères remerciements à Eddy Campbell, qui a terminé son mandat de président de la SMC en juin 2006. Si la SMC bénéficie de son souci d'équité, de son bon jugement, de sa vision et de son enthousiasme depuis plusieurs années, elle en a profité encore davantage durant ses deux années à la présidence. Parmi ses nombreux bons coups, je soulignerai en particulier sa réaction à la baisse de revenus tirés de nos publications. Tout en s'efforçant de réduire les coûts, Eddy a compris que la véritable solution consistait à doter la SMC d'une structure de financement efficace et il nous a guidés rapidement et efficacement vers cet objectif. Ce fut pour moi un grand plaisir de travailler avec Eddy en 2006, et j'aimerais le remercier, au nom de la Société, de son excellent travail.

TREASURER'S REPORT

David Rodgers, Treasurer

In the Operations Fund (General, Education, Research, and Publishing), there was an overall deficit of \$19,732, down from the end-of-year forecast of \$44,391. A significant component of the reduced deficit is due, in large part, to unanticipated donations and lower than projected committee expenses. In addition, there was a \$94,000 charge (\$104,000 had been budgeted) against the Contingency Fund to defray first-year start-up costs for the CMS fund-raising initiative. For 2007, on-going fundraising costs will become part of the operating budget. Numbers of subscription losses were slightly higher than the historical 5% year-to-year reported by most journal publishers but book series sales are beginning to see traction. Although the income from registration fees for the 2006 Summer meeting was significantly lower than projected, subscription and membership revenue was up over 2005, largely due to increased rates.

On balance, the CMS has seemingly stemmed the significant losses incurred in the Operations Fund for 2003 and 2004 with "close to" break-even years in 2005 and 2006.

The most significant component of recent deficits has been the impact of Canada-US exchange rates on publishing revenue. Going forward, the CMS fund-raising effort is expected to begin producing more revenue than it costs, thereby pushing our Operations once again into the black. Subsidy reports have been designed which reflect the level of support for all CMS activities and serve as a guide in setting priorities for fund-raising and budgeting.

The Society's Restricted Investments have been separated into Endowed Funds and a Contingency Fund and the newly formed Invested Funds Committee is responsible to the Board of Directors for the Society's restricted investments. An analysis of the costs of lifetime memberships has been completed, and the fee model adjusted. In 2007, the financial statements will reflect the liability associated with lifetime memberships.

Many members have been of assistance to me in a variety of ways this year as I learned the role of Treasurer, but I am especially indebted to Arthur Sherk, Yvette Roberts, Tom Salisbury, and Graham Wright for their contributions to my education.

EDUCATION COMMITTEE REPORT

Harley Weston (University of Regina), Chair

At the summer meeting of the CMS Education Committee in Calgary the Committee discussed the Adrien Pouliot award and between the summer and winter meetings the committee used email to determine a winner of the 2006 award. At both the summer meeting in Calgary and winter meeting in Toronto there were discussions regarding CMS presence at provincial teachers' conferences. The Committee continues to deliberate on how best to accomplish this. At the summer meeting the Committee discussed a proposal by Jonathan Borwein to create a database of mathematics outreach activities across the country. At the winter meeting the Chair reported that the CMS and Math Central had partnered to produce such a database that can be accessed on the web page of the Education Committee. Moderation of additions and changes to the database are currently handled at Math Central but after a year of activity this moderation will be transferred to the education committee.

A summary of the major activities throughout the year include:

- The education sessions at the 2006 Summer Meeting in Calgary were organized by Peter Taylor (Queen's). The

theme was *Does a Math Education PhD program belong in a Math Dept?* The presenters were Pamela Hagen (UBC), Peter Liljedahl (SFU), Lily Moshe (York), and Peter Taylor.

- The education sessions at the 2006 Winter Meeting in Victoria were organized by Walter Whiteley (York). The theme was *Programs in Mathematics for Future Teachers*. The presenters were Malgorzata Dubiel (SFU), Frédéric Gourdeau (Laval), Kathy Kubota-Zarivnij (Toronto District Catholic School Board; Ministry of Education), Louis Lim (York Region School Board), John Percy (Toronto), Kathryn Stewart (York Region School Board), Tara Taylor (St. Francis Xavier), and Walter Whiteley.
- The 2006 CMS Teaching Award was presented to Dr. Frédéric Gourdeau (Laval), at the Summer 2006 Meeting in Calgary where he gave an address titled *Mathematical education: a mathematician's perspective*. The address was followed by the Participant's Social on Saturday evening.
- The 2006 Adrien Pouliot Award was presented to Dr. Peter Taylor (Queens) at the Winter 2006 Meeting in Toronto where he gave an address titled *The structure of a mathematics curriculum*. The address was followed by the Participant's Social on Saturday evening.
- Following the advice of its subcommittee on provincial competitions the Education Committee made 6 awards for a total of \$3,500. The awards were to Alberta, Manitoba, Newfoundland, Ontario, Prince Edward Island, and Quebec.
- The CMS Chief Judge for the 2006 Canada Wide Science Fair was Stephan Whitney from the University of Quebec at Chicoutimi. The winners and their projects were profiled in the December 2006 issue of the CMS Notes. The winners of the CMS prizes were
 - Mate Bezdek from Calgary won the Junior Award of \$250 for his project titled *X-raying and Geometry*.
 - Daniel Bezdek from Calgary won the Intermediate Award of \$500 for his project titled *Set a Light Trap – the Penrose Puzzle*.
 - Nancy Nguyen from Vancouver won the Senior award of \$750 for her project titled *Elementary Proof for Blundon's Inequality*.
- The Canadian Mathematical Society was a sponsor of the annual Halton-Peel Regional Data Fair that was held on March 3, 2006 at Sheridan College in Oakville. Our judge was Jock Mackay of the University of Waterloo. A report on the Data Fair appeared in the May issue of the CMS Notes.
- The Education Committee Chair is one of the referees for the CMS Excellence in Teaching award. The 2007 award will be presented at the 2007 CMS Summer Meeting in Winnipeg. The Chair is also on the selection

committee for the Distinguished Service Award and the David Borwein Distinguished Career Award. In 2006 both awards were presented to Dr. Richard Kane (Western) at the 2006 Winter Meeting in Toronto.

- In June 2006, the Education Committee discussed a suggestion by Jonathan Borwein that the CMS create a catalogue of mathematics outreach activities across the country. In the summer of 2006 the CMS in partnership with Math Central developed a database of these activities that is available on the education page of the CMS web site and also on Math Central. This project was discussed again by the Education Committee at the December Meeting in Toronto. It was agreed that after a year of operation the moderation tasks associated with this database be transferred from Math Central to the CMS Education Committee.
- In addition to the National Camp at John Abbott College (see Mathematics Competition Committee Report), thirteen Esso/CMS Regional Camps took place across Canada at: Sir Wilfred Grenfell College (Newfoundland), the University of New Brunswick, Dalhousie University, l'Université du Québec à Rimouski, the University of Ottawa (two camps - one in English and one in French), Brock University, the University of Western Ontario, the University of Manitoba, the University of Regina, the University of Alberta, Simon Fraser University, Burnaby Campus, and Simon Fraser University, Surrey Campus.

Depending on the wishes and resources of the host institution, the format of the camps vary from day camps, lasting one day to five days, to residence camps, lasting three to seven nights. Students are introduced to mathematical ideas not normally encountered in high school, balanced by recreational activities involving individual and team competitions with an emphasis on problem solving. There are also extra curricular events and excursions. Students are individually challenged but there is also an emphasis on collaboration and shared activities in a fun environment.

More than 350 students participated in the various 2006 Math Camps and thanks go to the host institutes, the organizers, and the sponsors for a making all the camps such a success.

These camps are not only very valuable in motivating students to pursue mathematics and science, but they also stimulate all of those involved by enriching their teaching.

This is my last report as Chair of the Education Committee and I wish to thank the committee members and the staff at the CMS office for its support. The Chair of the Committee as of January 1, 2007 will be Dr. Joseph Khoury (Ottawa).

ENDOWMENT GRANTS COMMITTEE REPORT*Karl Dilcher (Dalhousie University), Chair*

Jennifer Hyndman (UNBC)
Bernard Hodgson (Laval)
Franklin Mendivil (Acadia)
Gord Sinnamon (Western)

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 \$16,000 for the 2006 competition. Three applications were received; all were funded and the total allocated amount was awarded. One project received full funding as requested, while the others received partial funding. All applicants have been notified by the CMS Executive Office in Ottawa.

The successful applications were as follows:

- A high-school mathematics contest in Thunder Bay; the Endowment Grant will allow for an expansion to additional schools in Northwestern Ontario.
- Supporting the production of a high-quality French-language mathematical publication and its distribution to schools in Quebec.
- The Canadian version of an international contest-game; the Endowment Grant will help with the expansion to more cities.

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.

The very low number of applications in 2006 was of some concern to the Committee, but it was noted that all applications were of high quality. It is hoped that with some increased advertising to the CMS membership and to department heads and chairs the numbers of applications will return to their usual levels.

The Committee asked the CMS Executive to increase the allocation from the Endowment Fund for the 2007 Endowment Grants Competition.

FINANCE COMMITTEE REPORT*James A. Mingo (Queen's University), Chair*

The Finance Committee advises the Board of Directors on the financial matters of the Society. Continuing an initiative from previous years, the Committee approved the allocation of \$400,000 from the Society's investments to the newly created CMS Endowment Fund. This fund as well as the CMS Mathematical Olympiads Fund and the David Borwein Distinguished Career Award Fund will be managed at arm's length by the newly created Investment Funds Committee, with the aim of making donations to the Society more attractive. The remaining amounts from the Society's investments were transferred to the CMS Contingency Fund.

This year the Committee reviewed the Society's lifetime memberships. After a careful analysis it was determined that the income from lifetime memberships already sold was insufficient to service the cost to the Society of these memberships. Accordingly, the Committee approved an increase in the price of lifetime memberships. I would like to thank David Bates for his help in this analysis.

At present non-Canadian subscribers to the Society's journals pay in US dollars. In 2006 the US dollar weakened against the Canadian dollar and thus there was a significant loss in revenue from foreign exchange. Nevertheless the Committee approved the 2007 budget with a projected surplus \$ 8,801.00. I would like to thank the new Treasurer, David Rodgers, for doing an excellent job in preparing the 2007 budget in these difficult circumstances.

NOMINATING COMMITTEE REPORT*Edgar Goodaire (Memorial University), Chair*

Most of the work of the Canadian Mathematical Society is carried out by more than 140 people who serve as officers or members of thirteen standing committees and subcommittees. As the year 2006 drew to a close, the Nominating Committee completed the arduous task of replacing about 25 of these volunteers whose terms ended on December 31. In addition, since 2007 is an election year, we had also to find people to serve on a new executive and as candidates for the CMS Executive Committee and Board of Directors.

There is an enormous amount of energy and talent within the Canadian mathematical community. What can be difficult for the Nominating Committee is discovering individuals who are willing to lend their expertise to the Society in some capacity or other, especially individuals who have not served before. Given the major turnover in mathematics faculty across the country in the last few years, it is important to involve "new

people”, a goal which has been uppermost in the minds of the present Nominating Committee, though one not always easy to achieve. We have also made a concerted effort to enlist the support of people not directly involved in academia because of the special expertise and fresh view points such individuals can provide.

Our current Treasurer and Chair of the Electronic Services Committee for several years, David Rogers, continues to bring to the Society a vast knowledge of technology and publishing. The Society is deeply grateful to Messieurs Klaus Peters and Walter Stewart, who regularly offer the Board of Directors comments and frank opinions based upon their intimate knowledge of the publishing and consulting industries.

In December, we were extremely pleased to welcome David Oakden to the Society’s newly formed Invested Funds Committee. With a Ph.D. in mathematics, David has spent his career in the actuarial industry, is a past president of the Canadian Institute of Actuaries and is now employed with the Canadian Government’s Office of the Superintendent of Financial Institutions. His perspective in the areas of finance and risk management is both broad and deep.

If you know of anyone within or outside academic circles whom you believe could help the Society, or if you yourself can see an opportunity for service, I urge you to contact chair-nomc@cms.math.ca.

It remains only to thank my colleagues on the 2006 Nominating Committee for their outstanding support and advice throughout the year.

STUDENT COMMITTEE REPORT

Joy Abramson (Toronto University) and Antoine Khalil (Concordia University), Co-chairs

2006 was a very exciting year for the CMS Student Committee (often referred to as “Stude”). Along with a faculty supervisor, Stude is comprised of ten students, both undergraduate and graduate, whose mission is to foster the development of a vibrant and highly interactive community of Canadian post-secondary mathematics students that leads to the continued creation of important long-term bonds between individuals. More information on the goals of Stude and its membership can be found on the CMS web site: www.cms.math.ca/Students.

Change of Membership

We thank all our past members, in particular Desmond Leung and Dan Pollock who left over the past year, for their contributions to Stude. We also welcome our six new members

this year: Mélisande Fortin Boisvert, Alejandro Erickson, Laura Gauthier, Pawel Gladki, Jessica McDonald, and Jenna Tichon. You can read about each of them on the newly updated biographies page on our website.

Student Newsletter

One way in which Stude promotes the interaction between Canadian post-secondary mathematics students is through our semiannual newsletter “The Student Mathematical Communicator” which is distributed to all mathematics departments in Canada. The newsletter communicates information of interest to students about Stude and the CMS. Stude publishes and distributes two student newsletters a year, one in each of the fall and winter semesters. This newsletter is being improved and reworked with every issue, with the most recent issue featuring a substantial increase in content, now filling four pages instead of two. We look forward to further improving the newsletter over the upcoming year.

Operations Manual for the Student Committee

Stude maintains an operations manual that describes the ongoing activities of the committee and improves the transitions when new students join. Over the past year, we moved the manual to an online private wiki format so that it can be updated more frequently and easily by all members of Stude.

CMS Meetings

As in past years, Stude organized a social event for graduate students at each of the CMS meetings in 2006. The events are always greatly enjoyed by the students in attendance. Stude plans to continue organizing these events at which Stude and the CMS are promoted to students attending the meeting as well as to local mathematics students. The next graduate student event will be held in Winnipeg during the CMS 2007 Summer Meeting. We wish to thank the local organizers of the CMS meetings for their enthusiastic co-operation in planning these socials.

Stude wishes to encourage more students to attend CMS meeting, and to enrich the experience for those who do attend. At the 2006 Winter meeting, we organized a well-attended panel discussion which focused on what students can do to prepare for a career in academia. At the 2007 Summer Meeting, Stude will coordinate a session for students on dealing with stress.

Stude Web Site

Over the past year, the Stude website has been vastly improved. Work was done to make maintenance of the site much easier. Content on the site has been updated and is continually being improved with the help of everyone on the Committee. One exciting development is that a French language version of

the site is in the works, with one page already translated (the listserv page) and others to appear during the winter and spring as translations and other French content becomes available. The site also features a new guide to attending math conferences that we believe will be very helpful to students. We encourage you to visit the site at www.cms.math.ca/Students and forward us your comments and suggestions.

Student Email Lists

The Studc webmaster moderates listservs that distribute announcements to math students across the country. There are separate lists for graduate and undergraduate students. There are currently approximately 160 members of the graduate list and 270 members of the undergraduate list. We are working to increase the frequency of postings to this list.

Canadian Undergraduate Mathematics Conference

CUMC 2006, the 13th annual Canadian Undergraduate Mathematics Conference, was held at McGill University from July 5 to July 9. The CUMC 2006 team did a fantastic job! The conference was a huge success and very well attended. Studc, on behalf of the CMS, once again gave \$1,000 towards the conference. We are now looking forward to CUMC 2007 which will be held July 18 to July 21 at Simon Fraser University in Vancouver. For more details, see www.cumc.math.ca.

A CUMC operations manual has been maintained for several years by Studc. This manual has proved very helpful to aid in the continuity of the CUMC. This year, it was converted to a wiki format. This allows all members of the CUMC organizing committee to access vital information at any time. As well, all persons involved at any stage of the CUMC organizing can add their input to the manual. This ensures the manual is kept up-to-date and allows for a smooth transition from year to year.

Web Forum

In July 2006, the undergraduate liaison on the Studc attended the CUMC at McGill University representing the Studc and had the opportunity to speak to fellow undergraduates and

inform them of the committee and ask what sorts of activities they would like to see. There we identified that a major concern of students was a lack of understanding of the committee's activity and a feeling of disconnect amongst student groups across the country. To address this we set up a web forum at www.studc.com/forum that was launched nationally on October 15th as a meeting place for math students across the country and currently has over 50 members. The topics range from discussions about graduate school, to marking philosophies, conferences, recreational mathematics and much more. In preparing for the web launch we also contacted student leaders at 26 universities to inform them of the committee in general and of the web page. We are also using the forum as a central point to inform them of CMS activities, membership and conferences. We are now working on increasing membership and awareness of the forum.

MITACS Liaison

Through the role of the CMS-MITACS liaison, both the CMS and MITACS student committees have been able to utilize each others resources such as newsletters, listservs, forums, etc., allowing both committees to reach a greater number of Canadian mathematics students. We are currently collaborating with the Student Advisory Committee of MITACS to offer joint student sessions and a joint student social at the upcoming conference.

Studc Poster

We continue to work on a design for a promotional poster. The purpose of these posters is to increase awareness among the Canadian mathematical community regarding the activities of the Student Committee. Our goal is to distribute the poster within math departments and have on display at events sponsored by the Student Committee. We hope to have promotional posters in distribution at the 2007 CMS Summer meeting.

Solution to April's Problem

With four 4's, logarithms, and square roots, we can express any natural number. For instance, consider the expression (with only three 4's):

$$\log_{\sqrt{4}} \left(\log_4 \sqrt{\sqrt{\dots\sqrt{4}}} \right)$$

which essentially counts the square root signs in the nest. (This result appears to have been independently rediscovered on various occasions, but hasn't killed off the pastime of finding "natural" solutions).

PUTNAM 2006: TWO CANADIAN TEAMS AMONG THE TOP TEN

Once again, Canadian students have distinguished themselves in the annual Putnam Mathematics Competition, held on December 2, 2006. The team from the **University of Toronto** consisting of **Tianyi David Han**, **János Kramár** and **Viktoriya Krakovna** placed fourth, winning for the University an award of \$10,000 and for each individual \$400. The team from the **University of British Columbia**, consisting of **Farzin Barekat**, **Cedric Lin** and **Samuel Wong** received honourable mention.

The highest ranking student at a Canadian institution was **Ralph Furmaniak** of the University of Waterloo, who ranked between 6 and 15 inclusive. Not far behind was **Cedric Lin** of the University of British Columbia, who ranked between 16 and 26 inclusive. Four students received honourable mention (ranking between 27 and 78 inclusive); **Tianyi David Han** and **János Kramár** from the University of Toronto, and **Tor Gunnar Myklebust** and **Xiao Heng Wang** from

the University of Waterloo. However, two other Canadian students, both former members of the Canadian team in the International Mathematical Olympiad who are now at American universities, did well. **Yufei Zhao** at the Massachusetts Institute of Technology is a Putnam Fellow (among the top five) and **Peng Shi** at Duke University received honourable mention.

Four Canadian universities, McGill, Toronto, Waterloo and British Columbia had among them fourteen students who placed among the top 200; half of these came from Waterloo. In all, there were 3640 competitors from 508 tertiary North American institutions, roughly 2000 of whom received a grade of 0. Students receiving a grade of 49 or better out of 120 ranked among the top 100. The Society congratulates these students most heartily for their achievement.

Ed Barbeau

Update on CMS Fundraising Activities

Over the past year the CMS has been successful on a number of fundraising initiatives. In March 2006, I was hired as the CMS Development Coordinator and since then I have worked closely with members of the CMS Executive and with Wade Chace-Hall, the fundraising counsel of Queens Advancement External Services (QAES).

The CMS has actively engaged with existing sponsors. As a result, a number of organizations have been willing to increase or renew their support for CMS activities, including several provincial governments, research institutes, and corporate sponsors such as the Imperial Oil Foundation, Sun Life Financial, and Thomson Nelson. The Society's Math Camps Program will lose NSERC PromoScience funding for 2007, but we will attempt to restore this for 2008.

In the fall of 2006, in conjunction with the annual budgeting process, a fundraising strategy was developed and has been implemented. The immediate goal is to target potential corporate sponsorships and foundation grants and then focus on individual giving programs (annual giving, major gifts and planned giving), with particular emphasis on our educational programs. In addition to helping with the fundraising strategy,

Executive and Board members have contributed financially to the CMS. The goal for 2007 is to raise \$331,000 in donations and grants. While this is an ambitious target, we believe it is achievable with the support and participation of CMS members and the efforts of the Executive Office staff. The focus is on those organizations that support mathematics, science, engineering and innovation.

To raise awareness of our fundraising efforts, a dedicated donation web page has been established with online giving capability. A promotional brochure has been created that can be viewed on the CMS website www.cms.math.ca/Docs/donating.html.

The Society appreciates the financial and volunteer support of our members and welcomes any comments you may have on our fundraising efforts and ideas for contacts, leads and potential prospects. I can be reached at 613-562-5800 extension 2769, e-mail at fundev@cms.math.ca.

Mark Bowman
Development Coordinator

Corrections

Brief Book Review, of the April issue, was written by Peter Fillmore (Dalhousie University) not Srinivasa Swaminathan.

In the review, *The Best of All Possible Worlds: Mathematics and Destiny*, the first sentence of the second paragraph should read "The idea of 'the best of all possible worlds' goes back at least as far as Voltaire, who used it in *Candide* to lampoon certain ideas of Maupertuis."

Correction

The Adrien-Pouliot Lecture, in the March issue, contained two images that were transposed in error.

Erratum

Quelques erreurs se sont glissées dans la version française de l'appel de candidatures pour les prix de recherche, publié dans les Notes de février. Vous trouverez la version corrigée à la page 32.

CALL FOR NOMINATIONS / APPEL DE MISES EN CANDIDATURE

The CMS Research Committee is inviting nominations for three prize lectureships. These prize lectureships are intended to recognize members of the Canadian mathematical community.

Le Comité de recherche de la SMC lance un appel de mises en candidatures pour trois de ses prix de conférence. Ces prix ont tous pour objectif de souligner l'excellence de membres de la communauté mathématique canadienne.

Prix *Coxeter-James* Prize Lectureship

2008

The Coxeter-James Prize Lectureship recognizes young mathematicians who have made outstanding contributions to mathematical research. The selected candidate will deliver the prize lecture at the Winter Meeting.

The recipient shall be a member of the Canadian mathematical community. Nominations may be made up to ten years from the candidate's Ph.D: researchers having their PhD degrees conferred in 1997 or later will be eligible for nomination in 2007 for the 2008 Coxeter-James prize. A nomination can be updated and will remain active for a second year unless the original nomination is made in the tenth year from the candidate's Ph.D.

Le prix Coxeter-James rend hommage aux jeunes mathématiciens qui se sont distingués par l'excellence de leur contribution à la recherche mathématique. La personne choisie prononcera sa conférence à la Réunion d'hiver.

Cette personne doit être membre de la communauté mathématique canadienne. Les candidats sont admissibles jusqu'à dix ans après l'obtention de leur doctorat : ceux qui ont obtenu leur doctorat en 1997 ou après seront admissibles en 2007 pour le prix Coxeter-James 2008. Toute mise en candidature est modifiable et demeurera active l'année suivante, à moins que la mise en candidature originale ait été faite la 10^e année suivant l'obtention du doctorat.

Prix *Jeffery-Williams* Prize Lectureship

2009

The Jeffery-Williams Prize Lectureship recognizes mathematicians who have made outstanding contributions to mathematical research. The prize lecture will be delivered at the Summer Meeting. The recipient shall be a member of the Canadian mathematical community. A nomination can be updated and will remain active for three years.

Le prix Jeffery-Williams rend hommage aux mathématiciens ayant fait une contribution exceptionnelle à la recherche mathématique. La personne choisie prononcera sa conférence à la Réunion d'été. Cette personne doit être membre de la communauté mathématique canadienne. Toute mise en candidature est modifiable et demeurera active pendant trois ans.

Prix *Krieger-Nelson* Prize Lectureship

2009

The Krieger-Nelson Prize Lectureship recognizes outstanding research by a female mathematician. The prize lecture will be delivered at the Summer Meeting. The recipient shall be a member of the Canadian mathematical community. A nomination can be updated and will remain active for two years.

Le prix Krieger-Nelson rend hommage aux mathématiciennes qui se sont distinguées par l'excellence de leur contribution à la recherche mathématique. La lauréate prononcera sa conférence à la Réunion d'été. La lauréate doit être membre de la communauté mathématique canadienne. Toute mise en candidature est modifiable et demeurera active pendant deux ans.

The deadline for nominations is June 30, 2007. Letters of nomination should be sent to the address below.

La date limite de mises en candidature est le 30 juin 2007. Veuillez faire parvenir les dossiers de candidature à l'adresse ci-dessous.

Nominators should ask at least three referees to submit letters directly to the Chair of the CMS Research Committee by September 30, 2007. Some arms length referees are strongly encouraged. Nomination letters should list the chosen referees, and should include a recent curriculum vitae for the nominee, if available.

Les proposants doivent faire parvenir trois lettres de référence au président du Comité de recherche de la SMC au plus tard le 30 septembre 2007. Nous vous incitons fortement à fournir des références indépendantes. Le dossier de candidature doit comprendre le nom des personnes données à titre de référence ainsi qu'un curriculum vitae récent du candidat ou de la candidate, dans la mesure du possible.

J.F. Jardine, Chair / Président
CMS Research Committee / Comité de recherches de la SMC
Department of Mathematics
The University of Western Ontario
London, Ontario N6A 5B7 Canada

The 2007 Krieger-Nelson and Jeffrey-Williams Prizes will be presented at the CMS-MITACS Joint Conference 2007 in Winnipeg, Manitoba, May 31 to June 3. Les prix Krieger-Nelson et Jeffrey-Williams 2007 seront présentés à la Congrès conjoint MITACS-SMC 2007 à Winnipeg (Manitoba) du 31 mai au 3 juin.

Du sang neuf à la Société : Ce mois-ci, vous trouverez dans les *Notes* le rapport annuel du président. Je serai donc bref pour l'instant et vous entretiendrai d'un seul sujet important : le recrutement de nouveaux membres pour la SMC.

La capacité de la SMC de livrer son large éventail de programmes et de services dépend très largement du travail et de l'appui financier de bénévoles de tout le pays (et d'ailleurs). Pour soutenir ces efforts, il est primordial que nous recrutions et intégrions à nos activités la nouvelle vague de jeunes professeurs et de nouveaux diplômés que nos universités et collèges embauchent activement depuis quelques années.

Si vous n'êtes pas membre de la SMC, je vous incite fortement à y adhérer et à devenir bénévole pour l'un de nos comités ou programmes. Si vous êtes déjà membre, je vous invite à convaincre vos nouveaux et anciens collègues de se joindre à nous. Vous pourriez par exemple inviter un membre du Comité exécutif de la SMC ou de son Conseil d'administration à dire quelques mots à une réunion de votre département ou de votre regroupement à propos du travail de la SMC. Je vous propose donc, en ordre d'importance :

Six raisons d'adhérer à la SMC :

1. *Je profite du travail de promotion et de défense des intérêts mathématiques que fait la SMC auprès des gouvernements, de l'industrie et des médias.* Par exemple, la SMC cherche à faire augmenter l'enveloppe totale de financement consacré aux mathématiques, et à veiller à ce que les politiques de financement (notamment celles du CRSNG) répondent équitablement aux besoins de la communauté mathématique.
2. *Je profite de l'infrastructure mise en place par la SMC.* La SMC organise des congrès, publie des revues scientifiques et offre des services électroniques. Si votre département publie des annonces de conférences ou des offres d'emploi, il est fort probable qu'il utilise notre liste de diffusion (cmath) pour le faire. Sinon, il le devrait!
3. *Je veux appuyer les activités éducatives de la SMC.* La Société organise par exemple des concours mathématiques, des camps mathématiques et des forums sur l'enseignement des mathématiques. Dans le cadre de ces activités, les mathématiciens contribuent de façon

importante à améliorer l'enseignement des mathématiques aux jeunes et à encourager les élèves talentueux à approfondir leurs connaissances mathématiques.

4. *Je veux me constituer un réseau d'amis et de futurs collaborateurs.* Voilà qui est possible en participant aux congrès et autres activités de la SMC. La participation aux structures organisationnelles de la SMC ou l'organisation de sessions lors des congrès sont d'excellents moyens de rencontrer des gens intéressants. Sans compter que ces activités rehaussent considérablement une demande de permanence!
5. *Je profite des avantages de l'adhésion.* Les membres de la SMC reçoivent par exemple les *Notes de la SMC* ainsi que des réductions sur les frais d'inscription aux congrès ou l'abonnement à diverses publications. Les nouveaux membres bénéficient de l'adhésion à moitié prix s'ils adhèrent pour deux ans. Grâce à une entente de réciprocité, les membres de la SMC obtiennent en outre une réduction sur l'adhésion à l'*American Mathematical Society* et à la *Mathematical Association of America*.
6. *Mes droits d'adhésion sont remboursables à même ma subvention du CRSNG.* Il s'agit là d'un privilège assez nouveau. Bien que ce ne soit pas en soi une raison pour devenir membre, il est encore plus facile d'adhérer une fois que les autres raisons vous auront convaincus!!

Ce sont toutes là d'excellentes raisons, mais ce n'est pas encore celle qui devrait surtout vous pousser à adhérer à la SMC. En fait, plutôt que de se demander ce que la SMC pourrait faire pour ses membres, bon nombre d'entre nous considèrent que l'adhésion à la Société et le soutien envers la communauté mathématique sont notre responsabilité – un geste que quiconque souhaite vraiment faire avancer la cause des mathématiques au Canada devrait poser.

Pour soutenir cette cause, la SMC s'est engagée à travailler avec tous les éléments de notre communauté et avec nos partenaires, comme les instituts de recherche, le Réseau MITACS et les associations provinciales. Nous continuerons à tisser des liens avec nos collègues de disciplines connexes et leurs sociétés professionnelles. Ensemble, nous réussirons à assurer la prospérité des mathématiques canadiennes.

CMS Prize Lecturships 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.smc.math.ca/Prizes/

CALENDAR OF EVENTS / CALENDRIER DES ÉVÉNEMENTS

19-23 Motives and Algebraic Cycles, A Conference Dedicated to the Mathematical Heritage of Spencer J. Bloch (Fields Institute, Toronto) Co-organized by the Clay Mathematics Institute
www.fields.utoronto.ca/programs/scientific/06-07/homotopy/

23-27 XVII Coloquio Latinoamericano de Algebra (Medellin, Colombia, South America)
<http://altenua.udea.edu.co/~claxvii/inglesindex.htm#20>

26-30 Workshop on Homotopy Theory of Schemes (Fields Institute, Toronto)
www.fields.utoronto.ca/programs/scientific/06-07/homotopy/

27-29 4th Joint meeting of the Canadian Society for History and Philosophy of Mathematics/Société canadienne d'histoire et de philosophie des mathématiques and the British Society for the History of Mathematics (Concordia University) www.cshpm.org

31-Aug 3 First Joint International Meeting between the AMS and the Polish Mathematical Society (Warsaw, Poland)
www.ams.org/amsmtgs/internmtgs.html

AUGUST 2007 AOÛT

5-9 Workshop on Logic, Rationality and Interaction (Beijing, China)
<http://www.illc.uva.nl/LORI>

22-24 International Symposium on Logic based program synthesis (Kongens Lyngby, Denmark)
<http://www.cs.kent.ac.uk/events/conf/2007/lopstr/lopstr-2007@kent.ac.uk>

SEPTEMBER 2007 SEPTEMBRE

17-21 "Free Probability, Random Matrices, and Planar Algebras" (Fields Institute workshop)
www.fields.utoronto.ca/programs/scientific/07-08/operator_algebras/

OCTOBER 2007 OCTOBRE

29-Nov 2 "Von Neumann Algebras" (Fields Institute workshop)
www.fields.utoronto.ca/programs/scientific/07-08/operator_algebras/

DECEMBER 2007 DÉCEMBRE

12-15 First Joint International Meeting between the AMS and the New Zealand Mathematical Society (NZMS) (Wellington, New Zealand)
www.ams.org/amsmtgs/internmtgs.html

8-10 **CMS Winter 2007 Meeting, Host: University of Western Ontario; Hilton Hotel, London, Ontario**
www.cms.math.ca/events_meetings@cms.math.ca

Tarifs et horaire 2007 Rates and deadlines

Deadlines for receipt of material are as follows / Les dates limites pour la réception des annonces sont les suivantes

Issue date/ date de parution	Content deadline / Date limite pour contenu		
February / février March / mars April / avril May / mai September / septembre October / octobre November / novembre December / décembre	December 1 / le 1 décembre January 15 / le 15 janvier February 15 / le 15 février March 15 / le 15 mars July 15 / le 15 juillet August 15 / le 15 août September 15 / le 15 septembre October 15 / le 15 octobre		
Net rates / tarifs nets	Institutional Members / Library Membres institutionnels / Bibliothèques	Corporate Members Membres Organisationels	Others/Autres
Full page / page complète	260.00	485.00	645.00
3/4 page	240.00	445.00	595.00
1/2 page	160.00	295.00	395.00
1/4 page	95.00	175.00	235.00
Back cover	325.00	615.00	815.00
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