

**FINALLY, NOW WE CAN
DO SOME **REAL** MATH!**



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cms NOTES de la SMC

February /
février
2019

President's Notes / Notes du président

Mark Lewis (*Alberta*)

President / président – CMS

What Makes a Society?



Dear members of the Canadian mathematical community, I warmly greet you and wish you an outstanding 2019. The Canadian Mathematical Society (CMS) is core to the mathematics community in Canada, and I am privileged to serve as President for two years (2018–20). A society is defined by the ideas, initiatives, and resources it can develop and put together to assist its membership and others. In my new role as President, I am learning how fortunate we are to have a group of staff and volunteers who are dedicated to serving mathematics in Canada, and how crucial they are to making the ideas, initiatives, and resources a reality.

One of our biggest recent developments is hiring our new Executive Director, Dr. Termeh Kousha, who started in September 2018. Termeh comes to us from the University of Ottawa, where she has an outstanding record of teaching and education. From September to December 2018, Termeh has been working with our outgoing Executive Secretary, Dr. Graham Wright. These past few months have been an incredible time of productivity and cooperation so I conclude that two Executives are better than one!

We are lucky to have had our outgoing Executive Secretary, Graham, over the last three years. He formally retired from this position at the end of December, 2018. He initially served as Executive Secretary from 1979 to 2009. During that time, he was tireless in his efforts to support the

Comment se définit une société?

À vous, chers membres de la communauté mathématique canadienne, mes meilleures salutations et une splendide année 2019! La Société mathématique du Canada (SMC) est au cœur de la communauté mathématique du pays, et j'aurai le privilège d'en assurer la présidence pendant deux ans (2018–2020). Une société se définit par les idées, les initiatives et les ressources qu'elle développe et qu'elle rassemble au profit de ses membres et de la communauté. En tant que nouveau président, je constate notre chance de pouvoir compter sur un groupe d'employés et de bénévoles qui se dévouent à la cause des mathématiques au Canada, ainsi que leur rôle essentiel dans la réalisation de nos idées, initiatives et ressources.

L'un de nos plus grands accomplissements ces derniers temps est certes l'embauche de notre nouvelle directrice administrative, Termeh Kousha, en septembre 2018. Termeh nous arrive de l'Université d'Ottawa, où elle s'est constitué un impressionnant dossier d'enseignement. De septembre à décembre 2018, elle a travaillé avec Graham Wright, secrétaire exécutif sortant de la SMC. Comme ces derniers mois ont été une période de grande productivité et d'intense collaboration, j'en conclus qu'on accomplit davantage à deux administrateurs qu'à un seul!

Nous avons été choyés de pouvoir compter sur notre secrétaire exécutif sortant au cours des trois dernières années. Graham a officiellement pris sa retraite à la fin de décembre dernier. Il avait été secrétaire exécutif de 1979 à 2009. Pendant ces 30 années, il a accompagné sans relâche la Société au sein de comités

Laying Out The Tools

Robert Dawson, *St. Mary's CMS Notes Editor-in-Chief*



This week I'm starting two very different series of lectures: one in first-year calculus, and one on complex analysis. In many ways they couldn't be more different. The calculus class – a winter re-offering of the fall course – has many students who don't want to be there, filling more than half the seats of one of my university's biggest lecture theatres. The complex analysis class, on the other hand, is very small – we almost didn't get permission to go ahead – and the students just radiate enthusiasm.

The calculus class is very practical. The students don't want me to teach them a lot of proofs, and I'm just as happy not to. They are there to learn how to differentiate things, and some of them will. The complex analysis class, on the other hand, are going for the full experience – they know that they are going to be proving theorems, giving presentations in class, and even writing a term paper.

But what do these first lectures have in common – apart, that is, from the handouts with office hours and my email address? In the calculus class, I've introduced the concepts of secant line, tangent line, slope, and limit, and computed a few simple examples. In the complex analysis course, we've seen a veritable blizzard of definitions, from the complex conjugate to the Riemann sphere. In each case, we're setting out the tools and parts we'll need to start the work.

And in each case it's humbling to look at those items and realize just how well-crafted they are, and what potential lies in them. The concept of a limit – like a pair of asbestos gloves to work with expressions too hot to handle in any other way – is so perfect for its purpose that it's hard to remember that many generations of great mathematicians got by without it. And the complex number system – the result of asking that one tiny equation, $x^2 + 1 = 0$, have a solution – is like a huge crystal that grows from one tiny seed. We've already shown, after one class, that every element of this number system has not just two square roots but n n^{th} roots.

And just wait till next week.



"The CMS was saddened to learn of the passing of Distinguished Professor Walter Craig (McMaster). This is a great loss to the mathematics community. Walter served as the director of The Fields Institute for Research in Mathematical Sciences from 2013-15 and contributed to Canadian mathematics in countless other ways." – CMS President Mark Lewis

Se donner les outils nécessaires

Cette semaine, je commence deux séries de cours très différents : le premier en calcul différentiel et intégral de première année, l'autre en analyse complexe. À bien des égards, ces deux cours sont plus différents. Le cours de calcul – une version hivernale du cours de l'automne – compte de nombreux étudiants qui n'ont pas le goût d'être là et qui occupent plus de la moitié des sièges de l'un des plus grands amphithéâtres de mon université. Le cours d'analyse complexe, en revanche, est un très petit groupe – nous n'avons presque pas obtenu l'autorisation de l'offrir – et les étudiants débordent d'enthousiasme. Le cours de calcul est très pratique. Les étudiants n'ont pas envie que je leur enseigne tout un tas de preuves, ce qui fait bien mon affaire. Ils sont là pour apprendre à différencier les choses, et certains y parviendront. Les étudiants du cours d'analyse complexe, de leur côté, veulent l'expérience totale : ils savent qu'ils vont devoir prouver des théorèmes, faire des présentations en classe et même rédiger une dissertation de fin de semestre.

Mais qu'est-ce que ces premiers cours ont en commun à part la feuille où sont inscrites mes heures de permanence et mon adresse courriel? Dans le cours de calcul, je présente les concepts de ligne sécante, de ligne tangente, de pente et de limite, ainsi que quelques exemples simples. Dans le cours d'analyse complexe, ils ont eu droit à un véritable tourbillon de définitions, du complexe conjugué à la sphère de Riemann. Dans les deux cas, nous définissons les outils et les éléments dont nous avons besoin pour commencer notre travail.

Et dans les deux cas, c'est une vraie leçon d'humilité que de constater à quel point ces outils et ces éléments sont bien conçus, et l'immensité de leur potentiel. Le concept de limite – tel une paire de gants en amiante permettant de travailler avec des expressions trop chaudes pour être manipulées autrement – est tellement parfait qu'il est difficile de concevoir que de nombreuses générations de grands mathématiciens s'en sont passé. Et le système de nombres complexes – le résultat de demander qu'une toute petite équation, $x^2 + 1 = 0$, ait une solution – est l'équivalent d'un énorme cristal qui naîtrait d'un minuscule grain. Nous avons déjà montré, après un cours, que chaque élément de ce système de nombres n'avait non seulement deux racines carrées, mais n n^{th} racines.

Imaginez ce qui s'en vient la semaine prochaine...

Letters to the Editors

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 the Executive Office or at notes-letters@cms.math.ca

Lettres aux Rédacteurs

Les rédacteurs des NOTES acceptent les lettres en français ou en anglais portant sur n'importe quel 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.

2019 CMS MEMBERSHIP RENEWALS RENOUVELLEMENTS 2019 À LA SMC



The 2019 membership renewals have been sent! Please renew your membership online by March 31, 2019 at portal.cms.math.ca by logging into your member account. Should you have any questions, please email us at memberships@cms.math.ca

Le renouvellement pour l'an 2019 a été envoyé! S'il vous plaît renouveler votre adhésion en ligne avant le 31 mars, 2019 à portail.smc.math.ca et en vous connectant à votre compte de membre. Si vous avez des questions, s'il vous plaît écrivez-nous à adhessions@smc.math.ca

NOTES DE LA SMC

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Les Notes de la SMC, les rédacteurs et la SMC ne peuvent pas être tenus responsables des opinions exprimées par les auteurs.

CMS NOTES

The CMS Notes is published by the Canadian Mathematical Society (CMS) six times a year (February, March/April, June, September, October/November and December).

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La Société mathématique du Canada appuie l'avancement, la découverte, l'apprentissage et l'application des mathématiques. L'exécutif de la SMC encourage les questions, commentaires et suggestions des membres de la SMC et de la communauté.

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The CMS promotes the advancement, discovery, learning and application of mathematics. The CMS Executive welcomes queries, comments and suggestions from CMS members and the community.

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Continued from cover

society through committees and scientific meetings. He oversaw many changes, helping to build the society's executive office in Ottawa and develop web-based services. Over the years, Graham contributed to almost all the society's operations, including serving as managing editor of many of the CMS's publications and working as organizer of major mathematics competitions, including the 1995 International Mathematical Olympiad in Toronto. The CMS simply would not have its impact on the professional mathematical community, nor its wide range of programs in research, publication, and mathematics education, without the extraordinary contributions of Graham Wright.

Graham entered his first retirement in 2009, looking forward to a relaxing life of watching the Ottawa Senators and trips to warm places. Little did he know what the future had in store for him. In September, 2015 we had a sudden opening in the position of Executive Director and the need for a steady hand at the helm. At the request of all involved, and true to form, Graham selflessly agreed to help out until such a time as we could find a new Executive Director. Graham has now entered his second retirement from the CMS. However, I very much hope that he can visit from time to time, assuming he can drag himself away from whatever beach or golf course he is relaxing on!

Another area of change this year has been with respect to developing a new CMS Fellows Program. The Fellows Program was instituted to recognize mathematicians who have made very significant contributions to the profession and to the Canadian Mathematical Society. The Fellowship recognizes CMS members who have made excellent contributions to mathematical research, teaching, or exposition and by having distinguished themselves in serving Canada's mathematical community. It was a great personal pleasure to help recognize 49 Inaugural CMS Fellows at the Winter Meeting Banquet in Vancouver this December.

The Winter Meeting Banquet also provided an opportunity to recognize outstanding research, teaching, and service in mathematics across Canada by presenting awards. The CRM-Fields-PIMS Prize was presented to Nassif Ghoussoub (UBC), the

Doctoral Prize to Thomas Hutchcroft (Cambridge), the G. de B. Robinson Award for publication of excellent papers to Patrick Ingram (York), and Anastasia Stavrova (St. Petersburg State), the Adrien Pouliot Award for mathematics education to the Centre for Education in Mathematics and Computation (Waterloo), the Coxeter James Prize for young mathematical researchers to Maksym Radziwill (McGill), the Graham Wright Award for Distinguished Service to Keith Taylor (Dalhousie), and the David Borwein Distinguished Career Award to To-Ming Lau (Alberta). These are in addition to prizes and awards presented in 2018 at the summer meeting in Fredericton: the Krieger-Nelson Prize for outstanding research by a female mathematician to Megumi Harada (McMaster), the Jeffery-Williams Prize for outstanding contributions to mathematical research to Gordon Slade (UBC), and the Excellence in Teaching Award to Gary MacGillivray (Victoria).

As is evident from the list of prizes above, Canada has a strong and vibrant mathematics community. Part of the strength of our Canadian mathematics community comes from its diversity. Indeed, one of the roles of the CMS is to foster diversity at all levels and to help provide an environment where all can thrive and feel comfortable. To this end, the CMS has developed new policy statements for diversity, for child care, and a code of conduct. These policies are all either approved or at the final stage of approval, prior to implementation. In some cases, implementation will mean real changes for the better, for example, by providing more comprehensive child care resources at meetings.

At the start of this article I mentioned that a society is defined by the ideas, initiatives, and resources it can develop and put together to serve its membership and others. As President of the CMS, I would like to connect to you, a member of the Canadian mathematical community, to ask for help on all three of these elements. You can play a role personally by sharing your ideas, by volunteering for CMS positions, and also by sharing resources through donations and planned giving to the CMS. I would always like to hear your ideas and what you have to say. Please email me at president@cms.math.ca.

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Suite de la couverture

et dans l'organisation de congrès scientifiques. Il a présidé à de nombreux changements et contribué à bâtir le bureau administratif de la Société à Ottawa et ses services web. Au fil des ans, il a participé à pratiquement toutes les activités de la Société, notamment à titre de rédacteur gérant de nombreuses publications de la SMC et d'organisateur de grands concours mathématiques, dont l'Olympiade internationale de mathématiques 1995, qui s'est tenue à Toronto. La SMC n'aurait jamais eu l'impact qu'elle a aujourd'hui sur la communauté mathématique professionnelle ni une telle diversité de programmes de recherche, de publication et d'éducation mathématique sans la contribution exceptionnelle de Graham Wright.

Graham a pris une première retraite en 2009. Il aspirait alors à une vie paisible alternant entre les matchs des Séateurs d'Ottawa et des escapades dans le Sud. Il ne se doutait certainement pas de ce qui l'attendait. En septembre 2015, le poste de directeur administratif s'est libéré de façon inattendue, et la Société avait besoin d'une poigne solide à la barre. À la demande de toutes les parties concernées, fidèle à ses habitudes et dans un élan d'altruisme, Graham a accepté d'aider la Société jusqu'à ce qu'elle trouve quelqu'un pour assurer la direction administrative. Il en est maintenant à sa deuxième retraite de la SMC. J'espère toutefois qu'il pourra nous rendre visite à l'occasion, en supposant qu'il arrive à s'extirper de la plage ou du terrain de golf où il coulera des jours paisibles...

Une autre nouveauté de cette année est la création du Programme des *fellows* de la SMC. Le Programme des *fellows* vise à récompenser les mathématiciens qui ont contribué de façon exceptionnelle à la profession et à la Société mathématique du Canada. Le titre de *fellow* récompense les membres de la SMC qui ont fait une contribution remarquable aux mathématiques en recherche, en enseignement ou en représentations, tout en se distinguant au service de la communauté mathématique canadienne. Ce fut un immense plaisir de récompenser les 49 premiers *fellows* de la SMC au banquet de la Réunion d'hiver de Vancouver en décembre.

Lors de ce banquet, nous avons également souligné des réalisations exceptionnelles en recherche, en enseignement et en service à la communauté mathématique du Canada. Nous avons remis le prix CRM-Fields-PIMS à Nassif Ghoussoub (UBC), le Prix de doctorat

à Thomas Hutchcroft (Cambridge), le prix G. de B. Robinson pour la publication d'articles exceptionnels à Patrick Ingram (York) et Anastasia Stavrova (St. Petersburg State), le prix Adrien-Pouliot pour l'enseignement des mathématiques au Centre for Education in Mathematics and Computing (Waterloo), le prix Coxeter-James pour les jeunes chercheurs mathématiciens à Maksym Radziwill (McGill), le prix Graham-Wright pour service méritoire à Keith Taylor (Dalhousie) et le prix David-Borwein de mathématicien émérite pour l'ensemble d'une carrière à To-Ming Lau (Alberta). À ces prix s'ajoutent ceux qui ont été remis à la Réunion d'hiver à Fredericton : le prix Krieger-Nelson pour la contribution exceptionnelle de mathématiciennes en recherche mathématique à Megumi Harada (McMaster), le prix Jeffery-Williams pour une contribution remarquable à la recherche en mathématiques à Gordon Slade (UBC) et le Prix d'excellence en enseignement à Gary MacGillivray (Victoria).

Comme en témoigne cette liste de récompenses, le Canada compte sur une communauté mathématique forte et dynamique. Ce dynamisme tient notamment à la diversité de notre communauté. En effet, l'un des rôles de la SMC est justement de favoriser la diversité à tous les niveaux et de bâtir une communauté où chacun pourra s'épanouir et se sentir bien. C'est dans cet esprit que la SMC a élaboré de nouvelles politiques en matière de diversité et de garde d'enfants, ainsi qu'un code de conduite. Ces politiques sont soit approuvées, soit à l'étape finale de l'approbation, juste avant leur mise en œuvre. Dans certains cas, la mise en œuvre se traduira par de réelles améliorations, par exemple l'offre de services plus complets de garde d'enfants aux Réunions semestrielles.

J'ai commencé cet article en soulignant qu'une société se définissait par les idées, les initiatives et les ressources qu'elle développe et qu'elle rassemble au profit de ses membres et de la communauté. En tant que président de la SMC, j'aimerais maintenant me tourner vers vous, les membres de la communauté mathématique canadienne, et solliciter votre aide à ces trois chapitres. Vous pouvez jouer un rôle personnel en exposant vos idées, en posant votre candidature à un poste au sein de la SMC ou en contribuant en ressources sous la forme d'un don ou d'un legs planifié à la SMC. N'hésitez surtout pas à me faire part de vos idées et de vos commentaires en m'écrivant à l'adresse president@smc.math.ca.

CORRECTION: In issue 50:6 of *CMS Notes* the CMS published a photo in error alongside the cover article contributed by Juris Steprans. The photo that should have been published can be seen on the right.

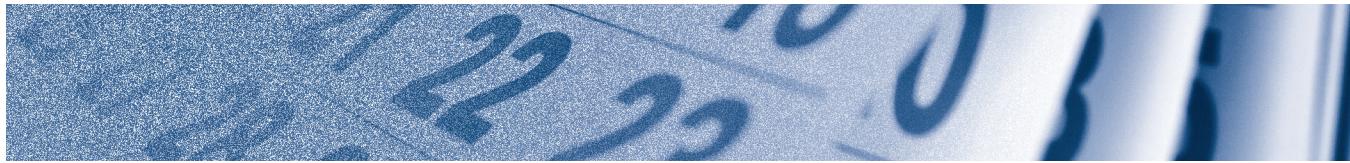


The Calendar brings current and upcoming domestic and select international mathematical sciences and education events to the attention of the CMS readership. Comments, suggestions, and submissions are welcome.

Patricia Dack, Canadian Mathematical Society,
(pdack@cms.math.ca)

Le calendrier annonce aux lecteurs de la SMC les activités en cours et à venir, sur la scène pancanadienne et internationale, dans les domaines des mathématiques et de l'enseignement des mathématiques. Vos commentaires, suggestions et propositions sont le bienvenue.

Patricia Dack, Société mathématique du Canada
(pdack@smc.math.ca)



FEBRUARY 2019 FÉVRIER

- | | |
|-----------------|--|
| 6 | Math Biology Seminar: Joy Richman, University of British Columbia, Vancouver, BC. |
| 8-9 | PIMS Mini-workshop on calculus of variations and partial differential equations around the work of Alessio Figalli, University of British Columbia, Vancouver, BC. |
| 10-15 | BIRS Workshop: Computational Light Transport, BIRS, Banff, AB. |
| 17-22 | BIRS Workshop: Statistical Analysis of Large Administrative Health Databases: Emerging Challenges and Strategies, BIRS, Banff, AB. |
| 24-Mar 1 | BIRS Workshop: Frontiers in Single-cell Technology, Applications and Data Analysis, BIRS, Banff, AB. |
| 24-Mar 1 | BIRS Workshop: Isogeometric Splines: Theory and Applications, BIRS, Banff, AB. |
| 27-Mar 1 | Workshop on Quantitative Analysis and the Digital Turn in Historical Studies, The Fields Institute, Toronto, ON. |

MARCH 2019 MARS

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| 1-31 | New Developments in Free Probability and Applications, CRM, Université de Montréal, Montreal, QC. |
| 3-8 | BIRS Workshop: Phase-Field Models of Fracture, BIRS, Banff, AB. |
| 4-5 | PIMS Mini-course on High-Dimensional Data in Uncertainty Quantification of PDEs, Simon Fraser University, Burnaby, BC. |
| 4-8 | CRM Workshop: Free Probability: the theory, its extensions, CRM, Université de Montréal, Montreal, QC. |
| 10-15 | BIRS Workshop: Asymptotic Algebraic Combinatorics, BIRS, Banff, AB. |
| 14 | Grande conférence de Mark Lewis, CRM, Montréal, QC. |
| 17-22 | BIRS Workshop: Mathematical Criminology and Security, BIRS, Banff, AB. |
| 22-24 | Montreal-Toronto Workshop in Number Theory: Period Maps, CRM, Université de Montréal, QC. |
| 24-29 | BIRS Workshop: The Topology of Nucleic Acids: Research at the Interface of Low-Dimensional Topology, Polymer Physics and Molecular Biology, BIRS, Banff, AB. |
| 25-29 | CRM Workshop: Free Probability: the applied perspective, CRM, Université de Montréal, Montreal, QC. |

APRIL 2019 AVRIL

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|--------------|---|
| 1-2 | Tutorial: A Computer-Assisted Constructive Approach to Nonlinear Dynamical Systems, CRM, Montreal, QC. |
| 3-6 | Workshop: Rigorous Computational Dynamics in Infinite Dimensions, CRM, Montreal, QC. |
| 5-7 | Flows on the Saskatchewan: a workshop on integrability and inverse problems, University of Saskatchewan, Saskatoon, SK. |
| 13-14 | Tutorial: A Topological-Combinatorial Framework for Dynamics, CRM, Montreal, QC. |
| 15-18 | Workshop: Data Driven Dynamics: Algebraic Topology, Combinatorics and Analysis, CRM, Montreal, QC. |
| 24-26 | International Arab Conference on Mathematics and Computation (IACMC 2019) Zarqa University |
| 26 | 2019 Math Horizons Day, University of Ottawa/Université d'Ottawa, Ottawa, ON. |
| 27-31 | BIRS Workshop: Optimal Transport Methods in Density Functional Theory, BIRS, Banff, AB. |
| 29 | Integration Challenge at StFX, St. Francis Xavier University, Antigonish, NS. |

MAY 2019 MAI

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|----------------|---|
| A29-M17 | Faces of Integrability, CRM, Montreal, QC. |
| 6-10 | Workshop on Geometrization of the Local Langlands Program, McGill University, Montreal, QC. |
| 13-15 | R à Québec 2019, Université Laval, Québec, QC. |
| 22-24 | Atlantic Causal Inference Conference 2019, McGill University, Montreal, QC. |
| 27-31 | BIRS Workshop: Optimal Transport Methods in Density Functional Theory, BIRS, Banff, AB. |
| 28-31 | CanaDAM 2019 : 7th Canadian Discrete and Algorithmic Mathematics Conference, Simon Fraser University – SFU Harbour Centre, Vancouver, BC. |
| 29 | Integration Challenge at StFX, St. Francis Xavier University, Antigonish, NS. |

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| 3-7 | 14 th International Conference on Finite Fields and their Applications (Fq14), Simon Fraser University, Vancouver, BC |
| 7-10 | 2019 CMS Summer Meeting / Réunion d'été de la SMC 2019, University of Regina, Saskatchewan / Université de Regina, Regina, SK. |
| 10-14 | A Celebration of Geometry, Analysis and Physics Conference honouring Niky Kamran on his 60th birthday, CRM, Montreal, QC. |

Book Reviews brings interesting mathematical sciences and education publications drawn from across the entire spectrum of mathematics to the attention of the CMS readership. Comments, suggestions, and submissions are welcome.

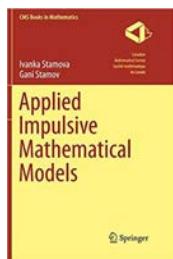
Karl Dilcher, Dalhousie University (notes-reviews@cms.math.ca)

Applied Impulsive Mathematical Models

by Ivanka Stamova and Gani Stamov
CMS Books in Mathematics, Springer, 2016

ISBN: 978-3-319-28060-8

Reviewed by *Shigui Ruan*, University of Miami



Many biological and physical processes have a sudden change in their states at certain moments in time, such as heart beats, vaccinations, therapies, electric shocks, etc. These processes are subject to short-term perturbations whose duration is very short in comparison with the duration of the process, that is, exhibiting impulsive effects. Differential equations that are used to model these processes with impulsive effects are called Impulsive Differential Equations. Fundamental theory, stability theory, and bifurcation theory of continuous equations (ordinary differential equations and delay differential equations) have been generalized to corresponding impulsive versions of equations, and several monographs have been published on this subject, including two by one of the authors.

The aim of the book under review is to collect the most recent results on impulsive mathematical models in science and engineering introduced by the authors. It consists of six chapters. Chapter 1 is a short introduction on the motivation of studying the subject and some examples of impulsive differential equation models in population dynamics, neural networks and economy. Chapter 2 presents basic theories and techniques of impulsive differential equations, including initial value problems, existence and uniqueness of solutions, periodic and almost periodic solutions, comparison theorem, stability theory and Liapunov second method, for both impulsive ordinary and delay equations.

Chapter 3 introduces some impulsive models in biology and the properties of these models. These include the existence of almost periodic solutions and exponential stability of a generalized impulsive delay Lasota-Ważewska red-blood model; the existence, uniqueness and exponential stability of positive almost periodic solutions of a generalized hematopoiesis model; conditional stability of a generalized n-dimensional impulsive system; strong stability and almost periodic solutions of a simplified 2-dimensional impulsive drug administration system; existence and exponential stability of almost periodic solutions of a delay logarithmic population model with impulsive effects; etc. Chapter 4 covers the mathematical analysis of impulsive models in population dynamics; namely, single-species models, two-species

Les comptes-rendus de livres présentent aux lecteurs de la SMC des ouvrages intéressants sur les mathématiques et l'enseignement des mathématiques dans un large éventail de domaines et sous-domaines. Vos commentaires, suggestions et propositions sont les bienvenus.

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models, multiple-species Lotka-Volterra-type models (ODE, with dispersion, with finite delay, with infinite delay, periodic, cooperative).

Chapter 5 treats impulsive artificial neural network models, including impulsive Hopfield neural network models, impulsive neural network models with finite delay, impulsive bidirectional associative memory neural network models, impulsive neural network models with infinite delay. Chapter 6 deals with a couple of impulsive models in economics; that is, the Solow-type integro-differential model with delays describes the dynamics of a capital-labor ratio and an impulsive price fluctuation model describing price changes in single commodity markets subject to short-time perturbations.

The book would be a valuable reference for researchers in applied differential equations and applied analysis. Impulsive differential equations indeed have been used extensively to model real biological and medical problems, such as pulse mass vaccination of some infectious diseases [1, 4] and pulsed therapies of some tumors [3, 5]. Besides stability and existence of periodic and almost periodic solutions in such models, bifurcations and chaos are also interesting and important nonlinear dynamical properties in impulsive biological models [2, 6], and there is a very large body of literature on these topics. Furthermore, numerical simulations are crucial in studying biological models and explain dynamical behavior. The book would have much more readers from biology and medicine had it included these topics and aspects.

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Education Notes brings mathematical and educational ideas forth to the CMS readership in a manner that promotes discussion of relevant topics including research, activities, and noteworthy news items. Comments, suggestions, and submissions are welcome.

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My problems are your problems: a problem-based approach to calculus

Kseniya Garaschuk,
University of the Fraser Valley

"In school we need to stay on the sidewalk, and it's fenced in, but the interesting math is on the other side of the fence, and we don't get to go there" – Johnathan Lepage-Billard, a high school student at a 2013 outreach event in Halifax

Learning school mathematics is often compared to learning sports, but I think the comparison between teaching math and teaching music is even better: both get taught in a mastery-based procedural way and even use the same types of materials, mostly the works of 18th century European men. So why are students' perceptions of the process and the disciplines overall so different? Sure, we do not subject ALL students to studying music for 10+ years in school like we do with math, but I think there is more to it.

We hear music everywhere: in the grocery store, at the hairdresser, in the elevator (it's the best kind), in the car. We are constantly surrounded by different kinds of music and this familiarity teaches us to distinguish between styles, recognize them and form our own unique musical tastes. So in the end, we only sing/hum/holler along to the songs we enjoy and we are usually free to choose those by simply changing the setting on a radio station or some device.

In school mathematics, there is only one channel. Students do not get to pick a genre or a style, nor do they get to decide on the tempo or even the volume. We often tell our students that math is everywhere, but they can rarely recognize it because they just don't know what to look for: there are no polynomials hanging out in mid-air and no ladders sliding down random walls (although that problem might become more pertinent in the near future). Secure credit card transactions, a map app finding the fastest route home or the nearest Pokéstop, accuracy of the weather forecast, frivolousness of buying a lottery ticket – these are just some of the things that students experience every day that they do not think of as being mathematical. We can hardly blame students for thinking that math is done because math they get exposed to IS done. So how can we inject real modern mathematics into our set and seemingly rigid curriculum?

In 2017, I was put in charge of the life sciences calculus stream at the University of the Fraser Valley and I took this opportunity to

Les Notes pédagogiques présentent des sujets mathématiques et des articles sur l'éducation aux lecteurs de la SMC dans un format qui favorise les discussions sur différents thèmes, dont la recherche, les activités et les nouvelles d'intérêt. Vos commentaires, suggestions et propositions sont les bienvenus.

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redesign the course and challenged myself to take a problem-based approach: teaching through posing big problems and developing tools to analyze and solve them, not the other way around. Finding appropriate problems was not easy: they have to be real, rich in content, interesting in context, yet accessible. Here is one example of a semester-long problem from my first-term calculus for life sciences and its approximate progression through the term.

Yellowstone wolves. Government predator control programs in the early 1900s eliminated the population of gray wolves from Yellowstone National Park with the last wolves being killed in 1926. The wolf absence caused an imbalance in the ecosystem, the elk populations began to rise and very quickly the conditions of the Park drastically declined. Re-introduction initiatives finally paid off and in 1995 wolves were brought back into the park. See video. <https://www.youtube.com/watch?v=ysa50BhXz-Q>

- **Week 1.** Consider questions that can be asked. Discuss simplifying assumptions and model limitations. Present non-examples.
- **Week 2.** Make qualitative graph sketches. Study three types of predator functional response to find which better suits wolf-elk behaviour.
- **Week 3.** Use known data and perform asymptotic analysis (limits at 0 and infinity) to model wolf predation rate (cubic Hill function) and elk reproduction rate (linear function).
- **Week 4.** Discuss changes in predation rate with respect to elk density. Study differentiation rules and interpret the results.
- **Week 5.** How does the amount of vegetation available for elks affect wolf population? Introduce the chain rule and interpret the results.
- **Week 6.** Use numerical methods of linear approximation and Newton's method to find ecological equilibrium. Involve Desmos and spreadsheets for calculations, visualization and interpretation.
- **Weeks 7-8.** For what prey density is prey most in danger? For what prey density is predator most in danger? Use calculus tools to find global and local extrema of the corresponding functions.
- **Weeks 8-9.** Sketch a precise graph of predation function. Discuss the importance and meaning of inflection points.

While some problems and examples can span the entire term, others make briefer yet important appearances in several topics. It is also important to remember that relevant and relatable examples do not always mean realistic, but it helps if they have charisma. Pop culture, cartoon and fairy tale scenarios are appreciated for their humour while being educational. My favourite calculus example

is the Goldilocks and the Three Bears problem in which students investigate Newton's Law of Cooling and whether it can explain the classical fairytale scenario.

So what did students think of our semester-long affair with Yellowstone wolves? Needless to say, I was delighted when I pulled up the video about the wolves and the room got filled with "oh yeah, that's cool", "haven't you heard about the wolves?", etc. – many already knew the story (in fact, someone said they just watched a documentary on it the night before!) And then I heard "but this is not math." Students are not used to thinking mathematically outside of the mathematics classroom, extracting quantitative information from a situation, making simplifying assumptions and finally building a mathematical model. For them, math is what begins after all of that. So for me, "this is not math" was a hidden compliment because we were about to extract the math from what was seemingly not math and use it to our advantage. Students are also not used to tackling mathematical problems that take more than 5 or 10 minutes to solve with no directions as to which tool to use. But my students actually found comfort in seeing the same problem appear again and again but from a different angle. I didn't have to reintroduce the set up and we got to learn just a little bit more about the situation week to week. One student said it was like playing Clue when you get to find out one piece of information at a time before you can finally put it all together to solve the murder mystery (I couldn't make this stuff up if I wanted to).

I saw higher engagement, I heard better questions with many of the "what if" format, and I witnessed noticeable improvement in interpreting results and writing up answers. But I am only human and a critic would argue that I probably saw what I wanted to see. So here are some numbers. At the end-of-term anonymous survey, students were asked a variety of questions about different course components. My last question was open-ended: "Math is...". I had 62 students in the class, 58 of whom completed this in-class survey (yes, my attendance is always that high). Out of those 58 students, 17 said "fun". 17 out of 58 said math was fun. Let that sink in. This is

a mandatory first-term differential calculus course with life sciences flavour and nearly a third of the students thought it was "fun". Here are some quotes from "Math is...":

- "interesting because it involves many different types of applications in 1 question".
- "fun. It is very fun to do math, when you can solve a long problem it is very satisfying. It is also very fun when you can relate math to real life and understand it."
- "fun to apply questions to real world and learn how to explain your answers."

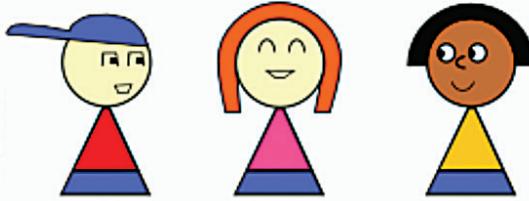
As mathematicians, we often teach service courses and hence need to work within a set curriculum. To add to the restrictions, learning outcomes in math courses are often content-based, which is in stark contrast to the situation our colleagues in, say, the English department face: you can teach rhetorical analysis using Tolstoy, Shakespeare or J. K. Rowling, but you can only teach differential calculus using derivatives. However, this does not mean there is complete lack of flexibility and no room for imagination. In fact, I consider these constraints a challenge, not a barrier, and I urge you to do the same.

We need to consciously work on developing contemporary approaches to our courses that will resonate with our students. We need to work towards closing the gap between school math and real math. We need to find ways to allow students to see math in things and to see why we do math. Without spirited and engaging education that includes the subject matter less than 200 years old and involving experts in the area, we are losing our best graduates to computer science, engineering, biology – nearly every other science that is either considered "cool" or has perceived better career potential. If palaeontologists can excite people and motivate them to learn about creatures that have been extinct for more than 65 million years, we can surely amaze our students with a current, dynamic and very much alive subject, namely, mathematics.

SUMMER VACATION

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STUDENTS

FINALLY, NOW WE CAN DO SOME *REAL* MATH!



PROFS

CSHPM Notes brings scholarly work on the history and philosophy of mathematics to the broader mathematics community. Authors are members of the Canadian Society for History and Philosophy of Mathematics (CSHPM). Comments and suggestions are welcome; they may be directed to either of the column's co-editors:

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The Program Ethnomathematics: Basic Ideas

Ubiratan D'Ambrosio, State University of Campinas, São Paulo [retired]

The Program Ethnomathematics is a research program that addresses the question of how the human species developed means for surviving and for transcending reality. It relies on analyses of the history of ideas and of the evolution of humankind's behavior and knowledge in every natural and sociocultural environment. Although the Program Ethnomathematics initially was used to better understand the history and philosophy of mathematics, it also has obvious applications for teaching mathematics [1]. It focuses on the complex generation and organization of knowledge and behavior by each individual (from birth to death), the socialization of that knowledge and behavior, and its appropriation by social groups. Essentially, the Program Ethnomathematics is a theory of knowledge following the pattern: generation[cognition] → socialization[epistemology] → expropriation[politics]. Ethnomathematics is not a final theory, which is why we call it a Research Program.

The Program Ethnomathematics is more ambitious than the study of mathematical ideas and techniques recognized in different ethnic groups and in artisanship and professional practices and even in different civilizations. Although using ethnography, ethnology, anthropology and cultural studies in general, it goes beyond these disciplines.

The main focus of the Program Ethnomathematics is to understand how humans, both individuals and groups, have developed various strategies of action. These strategies normally are ways, styles, arts and techniques of doing and knowing, which rely on learning, explaining facts and phenomena, and dealing with new situations and problems, in specific natural and socio-cultural environments. This is a cumulative process, developed by an individual and shared with other members of a group with common ancestry, myths, values, language and many other factors of affinity. Communication is fundamental in this process. The affinities result in common knowledge, in compatible behavior of individuals, in a common set of values, and also in a common language. These are the cultural traits of the group. The dynamics of encounters between individuals with different cultural traits enriches the entire process. This is intrinsic to the world-wide evolution of the species and to migratory fluxes. The migratory fluxes occurred with different objectives, such as searches for food or shelter or mating partners, land disputes and conquest, mythological/sacred reasons, and commerce.

Les articles de la SCHPM présente des travaux de recherche en histoire et en philosophie des mathématiques à la communauté mathématique élargie. Les auteurs sont membres de la Société canadienne d'histoire et de philosophie des mathématiques (SCHPM). Vos commentaires et suggestions sont le bienvenue; ils peuvent être adressées à l'une des co-rédacteurs:

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I understand Mathematics as a broad category, an abstract construct that originated in the cultures of the Mediterranean Basin and the Mesopotamian (Ancient Iraq) and Nile Valley civilizations. We might say that Academic (School) Mathematics is the Ethnomathematics of that region. This category of knowledge is sometimes referred to as the Euclidean style and as supported by *tertium-non-datur*, but this perspective is insufficient and even inadequate for dealing with facts and phenomena of other different natural and socio-cultural environments. As we learn from the eminent historian of mathematics Wu-Wen Tsun, ancient mathematics in China had a method of thinking and style of presentation different from Greek mathematics [2]. Similarly, we recognize different abstract constructs when we study the history of mathematics in ancient India, in the Andean civilizations, in sub-Saharan Africa, in Polynesia, indeed in every civilization in the world. There may be *some* similarities among the abstract constructs in different civilizations, but these are occasional. For each region, we have to understand the intellectuals, the artisans, the professionals, the people, the invisible society, their myths and systems of value, their knowledge systems—and the constant changes in those components, changes mainly due to encounters between civilizations.

Each part of the term "Ethnomathematics" is significant. I use the prefix *ethno* in a much broader sense than "ethnic", and *mathema* and *tics* with different meanings than in the academic discipline Mathematics. To foster understanding of the strategies of action in various natural and sociocultural environments as described above, I practiced an etymological abuse with the "free" appropriation of Greek roots: *techné* [*tics*] meaning ways, styles, arts and techniques; *mathema* for doing and knowing, for learning and explaining, for dealing with situations and solving problems; and *ethno* as referring to distinct and specific natural and socio-cultural environments. Thus, using these Greek roots, I synthesized as *tics + mathema + ethno* the processes through which groups of humans generated ways, styles, arts and techniques of doing and knowing, of learning and explaining, of dealing with situations and of solving problems unique to their environments.

Although researchers in ethnobotany, ethnomusicology, ethnolinguistics, ethnomethodology and other *ethno+* disciplines study specific aspects of different ethnic and social contexts, theirs are the views of outside observers trying to find commonalities between their own cultures and the one under study. My appropriation of the prefix *ethno* is very different. The conceptual way I introduced *ethno+mathema+tics* recognizes specific cognitive strategies of a culture to deal with reality. For example, it does not make sense

to address different ethnic groups asking questions such as “what is the meaning of a triangle?” or “how would you add 2 and 3?” or “what is the color of this flower?” The concepts “triangle”, “2 plus 3”, “color” may be absolutely senseless in a particular group’s culture. Very illustrative of this remark is the research on the *pirahã* culture in the Amazon Basin conducted by Daniell L. Everett. This research is related to the intriguing question of mutual influences of culture and cognition [3]. My appropriation of the concept of *mathema* as a philosophical category is especially fundamental. I claim that there are different ways of doing the equivalent of “mathematics” in different cultures. We might further explore this claim discussing the question of monism versus pluralism in logics.

This etymological analysis makes clear that to do research in the Program Ethnomathematics we must dialogue with an ethnic group in the broad sense, as stated earlier in this paper. A research methodology of the Program Ethnomathematics consists essentially of these steps:

- How do *ad hoc* practices and solution of problems develop into methods?
- How do methods develop into theories?
- How do theories develop into scientific invention?

I will not go into examples of the practice of this research methodology—they can be found in numerous publications in the area [4].

The concepts of the Program Ethnomathematics additionally challenge our standard approaches to teaching mathematics. Mathematics as conceived in the current school systems is both insufficient and discriminatory to the majority of the population. The pedagogical proposal of the Program Ethnomathematics instead provides a much

broader dimension to mathematical thinking, stressing its value as an instrument for explaining, understanding and coping with reality in its broad sense and for a critical view of the world. The main purpose is to build a civilization that rejects inequity, arrogance, and bigotry. Education must give special attention to the redemption of peoples that have been subordinated for a long time, and must give priority to the empowerment of the excluded sectors of societies.

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Ubiratan D’Ambrosio (ubi@usp.br) is an Emeritus Professor of Mathematics, State University of Campinas/UNICAMP, São Paulo, Brazil (retired in 1994). His full Curriculum Vitae is at [http://lattes.cnpqbr/1531403209010948](http://lattes.cnpq.br/1531403209010948).

2019 Graham Wright Award for Distinguished Service

CALL FOR NOMINATIONS

In 1995, the Society established this award to recognize individuals who have made sustained and significant contributions to the Canadian mathematical community and, in particular, to the Canadian Mathematical Society. The award was renamed in 2008, in recognition of Graham Wright’s 30 years of service to the Society as the Executive Director and Secretary.

CMS aims to promote and celebrate diversity in the broadest sense. We strongly encourage department chairs and nominating committees to put forward nominations for outstanding colleagues regardless of race, gender, ethnicity or sexual orientation.

Nominations should include a reasonably detailed rationale and be submitted by **March 31, 2019**.

All documentation should be submitted electronically, preferably in PDF format, by the appropriate deadline, to gward@cms.math.ca

Prix Graham-Wright pour service méritoire 2019

APPEL DE CANDIDATURES

En 1995, la Société mathématique du Canada a créé un prix pour récompenser les personnes qui contribuent de façon importante et soutenue à la communauté mathématique canadienne et, notamment, à la SMC. Ce prix était renommé à compter de 2008 en hommage de Graham Wright pour ses 30 ans de service comme directeur administratif et secrétaire de la SMC.

La SMC a pour but de promouvoir et de célébrer la diversité au sens le plus large. Nous encourageons fortement les directeurs de département et les comités de mise en candidature à proposer des collègues exceptionnels sans distinction de race, de genre, d’appartenance ethnique ou d’orientation sexuelle.

Pour les mises en candidature prière de présenter des dossiers avec une argumentation convaincante et de les faire parvenir, le **31 mars 2019** au plus tard.

Veuillez faire parvenir tous les documents par voie électronique, de préférence en format PDF, avant la date limite à prixgw@smc.math.ca

2019 Adrien Pouliot Award

CALL FOR NOMINATIONS

Nominations of individuals or teams of individuals who have made significant and sustained contributions to mathematics education in Canada are solicited. Such contributions are to be interpreted in the broadest possible sense and might include: community outreach programs, the development of a new program in either an academic or industrial setting, publicizing mathematics so as to make mathematics accessible to the general public, developing mathematics displays, establishing and supporting mathematics conferences and competitions for students, etc.

CMS aims to promote and celebrate diversity in the broadest sense. We strongly encourage department chairs and nominating committees to put forward nominations for outstanding colleagues regardless of race, gender, ethnicity or sexual orientation.

Nominations must be received by the CMS Office **no later than April 30, 2019**.

Please submit your nomination electronically, preferably in PDF format, to apaward@cms.math.ca.

Nomination requirements

- Include contact information for both nominee and nominator.
- Describe the nominated individual's or team's sustained contributions to mathematics education. This description should provide some indication of the time period over which these activities have been undertaken and some evidence of the success of these contributions. This information must not exceed four pages.
- Two letters of support from individuals other than the nominator should be included with the nomination.
- Curricula vitae should not be submitted since the information from them relevant to contributions to mathematics education should be included in the nomination form and the other documents mentioned above.
- If nomination was made in the previous year, please indicate this.
- Members of the CMS Education Committee will not be considered for the award during their tenure on the committee.

Renewals

Individuals who made a nomination last year can renew this nomination by simply indicating their wish to do so by the deadline date. In this case, only updating materials need be provided as the original has been retained.

Prix Adrien Pouliot 2019

APPEL DE CANDIDATURES

Nous sollicitons la candidature de personne ou de groupe de personnes ayant contribué d'une façon importante et soutenue à des activités mathématiques éducatives au Canada. Le terme « contributions » s'emploie ici au sens large; les candidats pourront être associés à une activité de sensibilisation, un nouveau programme adapté au milieu scolaire ou à l'industrie, des activités promotionnelles de vulgarisation des mathématiques, des initiatives spéciales, des conférences ou des concours à l'intention des étudiants, etc.

La SMC a pour but de promouvoir et de célébrer la diversité au sens le plus large. Nous encourageons fortement les directeurs de département et les comités de mise en candidature à proposer des collègues exceptionnels sans distinction de race, de genre, d'appartenance ethnique ou d'orientation sexuelle.

Les mises en candidature doivent parvenir au bureau de la SMC **avant le 30 avril 2019**.

Veuillez faire parvenir votre mise en candidature par voie électronique, de préférence en format PDF, à prixap@smc.math.ca

Conditions de candidature

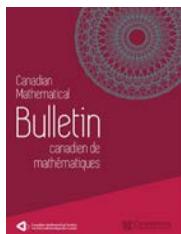
- Inclure les coordonnées du/des candidat(s) ainsi que du/des présentateur(s).
- Décrire en quoi la personne ou le groupe mis en candidature a contribué de façon soutenue à des activités mathématiques. Donner un aperçu de la période couverte par les activités visées et du succès obtenu. La description ne doit pas être supérieure à quatre pages.
- Le dossier de candidature comportera deux lettres d'appui signées par des personnes autres que le présentateur.
- Il est inutile d'inclure des curriculums vitae, car les renseignements qui s'y trouvent et qui se rapportent aux activités éducatives visées devraient figurer sur le formulaire de mise en candidature et dans les autres documents énumérés ci-dessus.
- Si la candidature a été soumise l'année précédente, veuillez l'indiquer.
- Les membres du Comité d'éducation de la SMC ne pourront être mis en candidature pour l'obtention d'un prix pendant la durée de leur mandat au Comité.

Renouveler une mise en candidature

Il est possible de renouveler une mise en candidature présentée l'année précédente, pourvu que l'on en manifeste le désir avant la date limite. Dans ce cas, le présentateur n'a qu'à soumettre des documents de mise à jour puisque le dossier original a été conservé.

CANADIAN MATHEMATICAL BULLETIN (CMB)

EDITOR-IN-CHIEF (EIC)



The CMS invites expressions of interest for the Editor-In-Chief (EIC) of CMB; two EICs are being solicited, with a term scheduled to commence January 1, 2020. Funding support from the CMS is available for both these EIC positions.

Since 1958, the Canadian Mathematical Bulletin (CMB) has been committed to publishing original mathematical research of high standard following rigorous academic peer review. New research papers are published continuously online and collated into print issues four times each year.

Expressions of interest should include a covering letter indicating the type of editorships you are interested in or becoming involved with, your curriculum vitae, and an expression of views regarding the publication. For EIC consideration, please also include an indication of support from your respective university.

Please submit your expression of interest electronically to: **CMB-EIC-2019@cms.math.ca** before April 15, 2019.

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Alexander Brudnyi (Calgary)	12/2020	Associate Editor
Krzysztof Burdzy (University of Washington)	12/2021	Associate Editor
Guillaume Chapuy (CNRS, Paris)	12/2021	Associate Editor
Ilijas Farah (York)	12/2020	Associate Editor
Ailana Fraser (UBC Vancouver)	12/2020	Associate Editor
Alexander Furman (Illinois Chicago)	12/2021	Associate Editor
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Philippe Gille (CNRS & Université Claude Bernard)	12/2021	Associate Editor
Vojkan Jaksic (McGill)	12/2021	Associate Editor
Lisa Jeffrey (Toronto)	12/2021	Associate Editor
Erwin Lutwak (Courant Institute)	12/2023	Associate Editor
Javad Mashreghi (Laval)	12/2020	Associate Editor
Marco Merkli (Memorial)	12/2020	Associate Editor
Nilima Nigam (Simon Fraser)	12/2020	Associate Editor
Malabika Pramanik (UBC Vancouver)	12/2023	Associate Editor
Alistair Savage (Ottawa)	12/2021	Associate Editor
Daniel Wise (McGill)	12/2018	Associate Editor
Jianhong Wu (York)	12/2023	Associate Editor

BULLETIN CANADIEN DE MATHÉMATIQUES (BCM)

RÉDACTEUR EN CHEF

La SMC invite les personnes intéressées par un poste de rédacteur en chef au BCM à lui faire part de leur intérêt. Deux postes de rédacteurs en chef sont à pourvoir, pour un mandat qui commencera en le 1 janvier 2020. La SMC offre du soutien financier pour ces deux postes.

Depuis 1958, le Bulletin canadien de mathématiques s'engage à publier des recherches en mathématiques, originales et de haut niveau, suivant de rigoureux examens par des pairs. Les articles de recherches sont disponibles en tout temps en ligne et sont rassemblés en quatre éditions imprimées par année.

Les propositions de candidature comprendront les éléments suivants : une lettre de présentation précisant le type de poste qui vous intéresse, votre curriculum vitae et un texte dans lequel vous exprimez votre opinion et vos idées par rapport à la publication. Pour les postes de rédacteur en chef, veuillez ajouter une preuve du soutien de votre université.

Veuillez faire parvenir votre candidature par courriel à : **BCM-REC-2019@smc.math.ca** au plus tard le 15 avril 2019.

Conseil de redaction pour le JCM et le BCM à présent :

Louigi Addario-Berry (McGill)	12/2021	Rédacteur en chef JCM
Eyal Goren (McGill)	12/2021	Rédacteur en chef JCM
Jie Xiao (Memorial)	12/2019	Rédacteur en chef BCM
Xiaoqiang Zhao (Memorial)	12/2019	Rédacteur en chef BCM
Fabrizio Andreatta (Università Studi di Milano)	12/2021	Rédacteur associé
Jason Bell (Waterloo)	12/2020	Rédacteur associé
Hans Boden (McMaster)	12/2020	Rédacteur associé
Kathrin Bringmann (Cologne)	12/2023	Rédactrice associée
Alexander Brudnyi (Calgary)	12/2020	Rédacteur associé
Krzysztof Burdzy (University of Washington)	12/2021	Rédacteur associé
Guillaume Chapuy (CNRS, Paris)	12/2021	Rédacteur associé
Ilijas Farah (York)	12/2020	Rédacteur associé
Ailana Fraser (UBC Vancouver)	12/2020	Rédactrice associée
Alexander Furman (Illinois Chicago)	12/2021	Rédacteur associé
Wee Teck Gan (National University of Singapore)	12/2021	Rédacteur associé
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Alistair Savage (Ottawa)	12/2021	Rédacteur associé
Daniel Wise (McGill)	12/2018	Rédacteur associé
Jianhong Wu (York)	12/2023	Rédacteur associé

CMS 2018 Winter Meeting Recap

Patricia Dack, *Fundraising and Communications Officer, CMS*

More than 500 mathematicians were welcomed to the Sheraton Vancouver Wall Centre for the 2018 CMS Winter meeting, December 7 to 10th. Participants attended five Plenary Lectures, a public lecture, four prize lectures and more than 30 scientific sessions.

The meeting opened with Professor Anthony Bonato's Public Lecture followed by a welcome reception that gave the CMS community a chance to visit and share research and catch up on what had transpired since the previous CMS meeting. Scientific sessions, plenary lectures and prize lectures filled the days leading up to the Awards banquet.

On Sunday December 9th during the Awards Banquet, the Inaugural Class of CMS Fellows was given their certificates as well as a commemorative pin. The 49 Fellows were acknowledged in a media release on December 7th. The CMS prizes and awards were also distributed during the banquet. The 2018 CMS Award winners are: The Centre for Education in Mathematics and Computing (CEMC), recipient of the Adrien Pouliot Award; Professor Maksym Radziwill (McGill) recipient of the Coxeter-James Prize; Thomas Hutchcroft (Cambridge) recipient of the Doctoral Prize; Patrick Ingram (York) and Anastasia Stavrova (St. Petersburg State) recipients of the G de B Robinson Award; and Keith Taylor (Dalhousie) and Anthony To-Ming Lau (Alberta) recipients of the Graham Wright Award for Distinguished Service and the David Borwein Distinguished Career Award respectively.

Dr. Nassif Ghoussoub (UBC) was named the recipient of the 2019 CRM-Fields-PIMS Prize.

The Student Committee Awards were also presented at the banquet: AARMS Prize: Raymond Walsh (Simon Fraser); CMS President's Prize: Weston Christopher Roda (Alberta); and CMS Student Committee Prize: Robyn Hearn (Simon Fraser).

The CMS would like to acknowledge the financial and administrative support of University of British Columbia, particularly Malabika Pramanik and Franco Saliola, the Scientific Directors, and a huge thank you to the Scientific Organizing Committee.

Finally we would like to acknowledge the session organizers for their part in making the 2018 CMS Winter Meeting a success.



Past President Michael Bennett (UBC) presents Maksym Radziwill (McGill) with 2018 Coxeter-James Prize



Dr. Graham Wright is presented with award of achievement by President Mark Lewis (Alberta)



Dr. Nassif Ghoussoub (UBC) was named the recipient of the 2019 CRM-Fields-PIMS Prize



Raymond Walsh (Simon Fraser) is presented with the AARMS Award by Professor Dorette Pronk (Dalhousie)



Robyn Hearn (Simon Fraser) receives the CMS Student Committee Award from President Mark Lewis (Alberta)



Patrick Ingram (York) receives the G. de B. Robinson award from CMS President Mark Lewis (Alberta)



Mark Lewis remercie les directeurs scientifiques Malabika Pramanik (UBC) et Franco Saliola (UQAM)



Weston Christopher Roda (Alberta) reçoit le Prix du président de la SMC, remis par le président de la SMC, Mark Lewis (Alberta)



Keith Taylor (Dalhousie) reçoit le prix Graham-Wright pour service méritoire de Mark Lewis (Alberta), président de la SMC



Ian VanderBurgh accepte le prix Adrien-Pouliot au nom du Centre for Education in Mathematics and Computing remis par Mark Lewis (Alberta), président de la SMC



Mark Lewis remet le Prix de doctorat à Thomas Hutchcroft (Cambridge)



Thomas Hutchcroft (Cambridge) (à droite) reçoit la Médaille académique du Gouverneur général



Résumé de la Réunion d'hiver de la SMC 2018

Patricia Dack, agente de la collecte de fonds et des communications, SMC

Plus de 500 mathématiciens se sont réunis au Sheraton Vancouver Wall Centre pour la Réunion d'hiver de la SMC 2018, du 7 au 10 décembre. Les participants ont eu droit à cinq conférences plénierées, une conférence publique, quatre conférences de lauréats de prix et plus de 30 sessions scientifiques.

La conférence publique du professeur Anthony Bonato a ouvert le bal, suivie d'une réception d'accueil où les membres de la communauté mathématique ont eu l'occasion de se retrouver, de se parler de leurs recherches et de tout ce qui s'est passé depuis la dernière Réunion. Les sessions scientifiques, les conférences plénierées et les conférences de lauréats ont bien meublé les jours qui ont précédé le banquet de remise des prix.

Le dimanche 9 décembre, dans le cadre du banquet, la SMC a présenté sa cohorte initiale de *fellows* en leur remettant un certificat et une épingle commémorative. La nomination de ces 49 *fellows* a fait l'objet d'un communiqué de presse diffusé le 7 décembre. La SMC a également décerné les prix suivants lors du banquet : le prix Adrien-Pouliot au Centre for Education in Mathematics and Computing; le prix Coxeter-James au professeur MakSYM Radziwill (McGill); le Prix de doctorat à Thomas Hutchcroft (Cambridge); le prix G.-de-B.-Robinson à Patrick Ingram (York) et Anastasia Stavrova (St. Petersburg State); le prix Graham-Wright pour service méritoire à Keith Taylor (Dalhousie) et le prix David-Borwein de mathématicien émérite pour l'ensemble d'une carrière à Anthony To-Ming Lau (Alberta).

Nassif Ghoussoub (UBC) a pour sa part reçu le prix CRM-Fields-PIMS 2019.

Des prix ont aussi été remis à des étudiants :

Le Prix de l'AARMS à Raymond Walsh (Simon Fraser); le Prix du président de la SMC à Weston Christopher Roda (Alberta) et le Prix du Comité des étudiants de la SMC à Robyn Hearn (Simon Fraser).

La SMC aimerait remercier de leur soutien administratif et financier l'Université de la Colombie-Britannique et les directeurs scientifiques Malabika Pramanik et Franco Saliola, de même que le Comité du programme scientifique.

Merci enfin aux organisateurs de sessions, qui ont contribué à faire de la Réunion d'hiver 2018 de la SMC un franc succès.

Anthony To-Ming Lau (Alberta) reçoit le prix David-Borwein pour l'ensemble d'une carrière 2018 du président de la SMC, Mark Lewis (Alberta)

David Borwein Distinguished Career Award / Prix David Borwein de mathématicien émérite pour l'ensemble d'une carrière

Anthony To-Ming Lau (Alberta)



Lau has published more than 150 research articles and monographs, and served as Department Chair (Mathematical and Statistical Sciences) at the University of Alberta, as well as CMS President (2008 – 2010). Distinguished Award Selection Committee Chair, Dr. Michael Bennett noted that Dr. Lau epitomized the spirit of the award, stating “perhaps Dr. Lau’s greatest contribution to

Canadian mathematics lies in his mentorship and supervision of more than two dozen Ph.D. students, many of whom have themselves gone on to distinguished careers as scholars, educators and leaders, attaining prominence in Canada, the US and beyond”.

Il a publié plus de 150 articles scientifiques et monographies, il a dirigé le Département de sciences mathématiques et statistiques de l’Université de l’Alberta et il a été président de la SMC de 2008 à 2010. Le président du Comité de sélection du Prix pour service méritoire, Michael Bennett, souligne que le professeur Lau incarne l’esprit du prix et que « sa plus grande contribution aux mathématiques canadiennes est sans doute son travail de mentor et la direction de plus de 25 doctorants, dont beaucoup ont été eux-mêmes devenus chercheurs, éducateurs et dirigeants et ont fait leur marque au Canada, aux États-Unis et ailleurs ».

Graham Wright Award for Distinguished Service/ Prix Graham Wright pour service méritoire

Keith Taylor (Dalhousie)



Praised by his colleagues as being an ‘excellent role model for a well-rounded mathematician’, Dr. Taylor’s career, spanning more than four decades, has truly exemplified what this award represents, not just because of his excellent record of research and mentorship, but also through his academic work as Associate Dean, Dean and Associate

Vice President at two Universities and through years of fundamental service to the CMS, including a term as President (2012-2014). Indeed, just to list his CMS committee work and appointments takes a full page on his vitae!

Loué par ses collègues comme un modèle de mathématicien polyvalent, Keith Taylor exerce sa profession depuis quarante années et incarne à merveille ce que le prix récompense, par l’exemplarité de ses travaux comme chercheur et mentor, ses activités comme doyen associé, doyen et vice-recteur associé de deux universités ainsi que ses années de services essentiels à la SMC, dont il a été président le temps d’un mandat (2012-2014). De fait, la liste des comités auxquels il a siégé et des postes qu’il a occupés au sein de la SMC fait une pleine page de son curriculum vitae.



Complimentary Online access to CJM and CMB now available to CMS members!

The Canadian Mathematical Society (CMS) has established a publishing partnership with Cambridge University Press for the production of the Canadian Journal of Mathematics (CJM) and the Canadian Mathematical Bulletin (CMB). Effective immediately, all CMS members receive complimentary online access to the CJM and the CMB through his/her CMS member portal.

CMS members can also receive print subscriptions at a discounted price by contacting subscriptions_newyork@cambridge.org (Americas) and journals@cambridge.org (United Kingdom and Rest of World).

For further information, please contact memberships@cms.math.ca.

Accès en ligne gratuit au JCM et au BCM maintenant disponible pour les membres de la SMC !

La Société mathématique du Canada (SMC) a conclu un partenariat avec Cambridge University Press pour la publication du *Journal canadien de mathématiques* (JCM) et du *Bulletin canadien de mathématiques* (BCM). À compter de maintenant, tous les membres de la SMC bénéficient d’un accès en ligne gratuit au JCM et au BCM par le portail des membres de la SMC.

Les membres peuvent également s’abonner aux versions papier à prix réduit en écrivant à subscriptions_newyork@cambridge.org (Amériques) ou à journals@cambridge.org (Royaume-Uni et reste du monde).

Pour plus amples renseignements, veuillez communiquer au adhesions@smc.math.ca.

Adrien Pouliot Award/ Prix Adrien Pouliot

Centre for Education in Mathematics
and Computing (CEMC)



Based at the University of Waterloo, the CEMC is one of Canada's largest outreach organizations in mathematics and computer science. The focus of the center is to increase interest, enjoyment, confidence, and ability in mathematics and computer science among learners and educators in Canada and internationally. Each year, the CEMC reaches hundreds of thousands through its contests and website, and tens of thousands through its face-to-face workshops. Today, the CEMC's team consists of approximately 40 people, including faculty and staff, as well as mid-career and retired teachers working on specific CEMC projects.

Basé à l'Université de Waterloo, le CEMC est l'un des plus importants organismes de sensibilisation en mathématiques et en informatique au Canada. Il a pour objectif d'accroître l'intérêt, le plaisir, la confiance et la capacité en ce qui a trait aux mathématiques et à l'informatique chez les apprenants et les enseignants au Canada et à l'étranger. Chaque année, le CEMC rejoint des centaines de milliers de personnes par ses concours et de son site Web, et des dizaines de milliers de personnes grâce à ses ateliers en personne. Aujourd'hui, l'équipe du CEMC comprend environ 40 personnes, y compris le corps professoral et le personnel, ainsi que des enseignants qui sont en milieu de carrière ou retraités et qui travaillent sur des projets précis de l'organisme.

Excellence in Teaching Award / Prix d'excellence en enseignement

Gary MacGillivray (Victoria)



MacGillivray's style of teaching, his dedication and commitment to his students' success have certainly left a long lasting impact on the path many of them take. As a result of following his inspiring courses, some of his students followed his footsteps and became teachers themselves; and some have been inspired to change their University major to Mathematics or mathematical education. He also seems to be among the few Canadian mathematicians who realized early in their career the value of exposing undergraduate students to the value of research in Mathematics.

Son style d'enseignement, son dévouement et son engagement envers la réussite de ses étudiants ont certainement laissé des traces durables sur le parcours de beaucoup d'entre eux. Parce qu'ils ont suivi ses cours si inspirants, certains de ses étudiants ont suivi ses traces et sont devenus enseignants eux-mêmes, et d'autres ont été modifiés leur parcours universitaire pour obtenir une majeure en mathématiques ou un baccalauréat en enseignement des mathématiques. Il semble également faire partie des quelques mathématiciens canadiens qui ont réalisé au début de leur carrière l'importance d'exposer les étudiants de premier cycle à la valeur de la recherche en mathématiques.

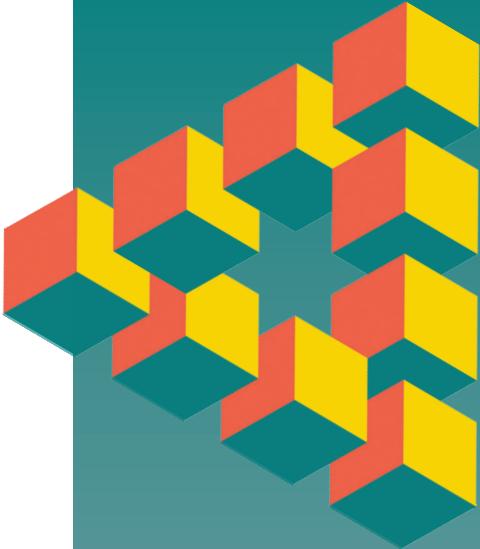
Did You Know that CMS Membership

has several benefits including discounts?

- » Searchable Online Membership Directory
- » Complimentary online access to the Canadian Journal of Mathematics and the Canadian Mathematical Bulletin, effective January 2019
- » Math departments can sponsor students
- » Dues are an eligible expense from NSERC Discovery Grants
- » Discounted registrations fees at meetings
- » 50% off reciprocal memberships
- » Up to 50% off publications
- » Includes CMS Notes newsletter

Saviez-vous que l'adhésion à la SMC offre plusieurs avantages, notamment des réductions ?

- » Répertoires des membres consultables en ligne
- » Accès gratuit en ligne au Journal canadien de mathématiques et au Bulletin canadien de mathématiques, à compter de janvier 2019
- » Les départements peuvent parrainer l'adhésion de leurs étudiants
- » Jusqu'à 50% réduction sur les publications
- » Les frais sont une dépense admissible pour les Subventions à la découverte du CRSNG
- » Réductions sur les frais d'inscriptions aux Réunions de la SMC
- » 50% pour joindre à d'autres sociétés ayant un accord de réciprocité avec la SMC
- » Inclus notre bulletin – Notes de la SMC



G. de B. Robinson Award / Prix G. de B. Robinson

Patrick Ingram (York) & Anastasia Stavrova (St. Petersburg State)



The high relevance of Professor Ingram's paper comes from being the first published work describing the arithmetic of post-critically finite self-maps for higher dimensional spaces. This paper opens new avenues for research, due to the importance of the dynamical behaviour of the critical locus for endomorphisms of PN. Professor Ingram is being recognized for his paper "Rigidity and height bounds for certain post-critically finite endomorphisms of PN" (Canad. J. Math. 68 (2016), no. 3, 625-654).

Dr. Anastasia Stavrova's paper is a fundamental contribution to group theory and Lie theory, which provides a deep understanding of the automorphism groups of multiloop Lie algebras in higher nullity. Stavrova invented a striking technique of doubling of variables, which should

have further applications in the theory of loop group schemes, which in particular applies to extended affine Lie algebras. Dr. Anastasia Stavrova is being recognized for her paper "Non-stable K1-functors for Multiloop Groups" (Canad. J. Math. 68 (2016), no. 1, 150-178).

La grande *pertinence* de cet article tient au fait qu'il s'agit du premier article décrivant l'arithmétique des auto-fonctions post-critiques finies pour les espaces de plus grande dimension. Cet article ouvre de nouvelles avenues de recherche en raison de l'importance du comportement dynamique du lieu critique pour les endomorphismes de PN. Le professeur Patrick Ingram est récompensé pour son article « Rigidity and height bounds for certain post-critically finite endomorphisms of PN » (JCM, 68 (2016), no 3, 625-654).

Contribution fondamentale à la théorie des groupes et à la théorie de Lie, son article approfondit la compréhension des groupes d'automorphismes des algèbres de Lie à boucles multiples et de nullité supérieure. Mme Stavrova a inventé une technique étonnante de dédoublement de variables, qui devrait avoir d'autres applications dans la théorie des schémas de groupes de boucles, qui s'applique en particulier aux algèbres de Lie affines étendues. Anastasia Stavrova est récompensée pour son article « Non-stable K1-functors for Multiloop Groups » (JCM, 68 (2016), no 1, 150-178).

Coxeter-James Prize / Prix Coxeter-James

Maksym Radziwill (McGill)



Professor Radziwill has earned a number of honours and awards, namely the SASTRA Ramanujan Prize in 2016 with Matomaki, his work with Matomaki was the object of a Séminaire Bourbaki in 2016, in 2017 he was awarded the Sloan Fellowship. Radziwill was invited as a speaker at the International Mathematical Congress at Rio de Janeiro in 2018. He is currently a Canada Research Chair II at McGill University until 2021.

Maksym Radziwill a reçu plusieurs honneurs et récompenses, dont le prix Ramanujan SASTRA en 2016 avec Matomaki et la bourse Sloan en 2017. Ses travaux avec Matomaki ont de plus fait l'objet d'un Séminaire Bourbaki en 2016. Il a également été conférencier au Congrès international de mathématiques à Rio de Janeiro en 2018 et il est actuellement titulaire d'une chaire de recherche du Canada de niveau II à l'Université McGill jusqu'en 2021.

Doctoral Prize / Prix de doctorat

Thomas Hutchcroft (Cambridge)

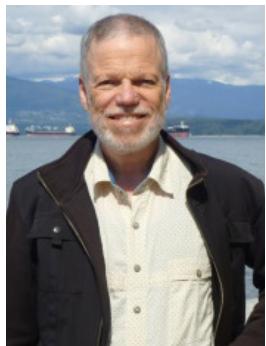


Thomas Hutchcroft is regarded as one of the top recent Ph.D.s in probability theory in the world. His thesis is an impressive collection of results, most of which are published in leading journals, such as *Inventiones Mathematicae*, *Geometrical and Functional Analysis* and *Annals of Probability*. In particular, together with Asaf Nachmias, Hutchcroft has made remarkable progress in the study of uniform spanning trees on unimodular and planar graphs, answering several open questions raised in a celebrated paper by Benjamini, Lyons, Peres and Schramm.

Thomas Hutchcroft est considéré comme l'un des meilleurs nouveaux docteurs en théorie des probabilités au monde. Sa thèse est une collection impressionnante de résultats, dont la plupart sont publiés dans des revues de premier plan, dont *Inventiones Mathematicae*, *Geometrical and Functional Analysis* et *Annals of Probability*. En particulier, en collaboration avec Asaf Nachmias, il a fait des progrès remarquables dans l'étude des arbres couvrants uniformes sur des graphes unimodulaires et planaires, répondant à plusieurs questions ouvertes soulevées dans un article célèbre de Benjamini, Lyons, Peres et Schramm.

Jeffery-Williams Prize / Prix Jeffery-Williams

Gordon Slade (UBC)



Professor Slade has done outstanding work in rigorous statistical mechanics, motivated by the physics of critical phenomena. With his collaborators, Slade has developed two major mathematical tools for statistical mechanics.

Le professeur Slade a fait un travail remarquable en

mécanique statistique rigoureuse, motivé par la physique des phénomènes critiques. Avec ses collaborateurs, Slade a développé deux outils mathématiques majeurs pour les mécaniques statistiques.

Krieger-Nelson Prize / Prix Krieger-Nelson

Megumi Harada (McMaster)



Harada's papers have been published in many of the top journals in the field, such as *Inventiones Mathematica*, *Advances in Mathematics*, *Geometry and Topology*, *Journal of Symplectic Geometry*, and *Transactions of the American Mathematical Society*. Professor Harada's *Inventiones* paper "Integrable

systems, toric degenerations and Okounkov bodies" with Kaveh has attracted much attention, as it provides a new connection between algebraic geometry and the symplectic geometry of integrable systems.

Les articles de Megumi Harada ont été publiés dans nombre des revues les plus prestigieuses du domaine, dont *Inventiones Mathematica*, *Advances in Mathematics*, *Geometry and Topology*, *Journal of Symplectic Geometry* et *Transactions of the American Mathematical Society*. L'article de la professeure Harada intitulé « Integrable systems, toric degenerations and Okounkov bodies » (systèmes intégrables, dégénérations toriques et corps d'Okounkov), rédigé avec Kiumars Kaveh et publié dans la revue *Inventiones*, a suscité un grand intérêt.

Computing Science and Mathematics: Tenure-Track Faculty Position

The Department of Mathematical Sciences in Trinity Western University's Faculty of Natural and Applied Sciences invites applications for a full-time tenure-track faculty position starting August 16, 2019. We are seeking someone with teaching/research interests in one or more of the following: computing science, applied or computational mathematics, statistics, and/or data science. Combined interests in computing science with either statistics (big data), or discrete mathematics would be particularly useful. The applicant must have a Ph.D. and will be expected to continue and sustain an active research program (ideally involving undergraduate research assistants) and to show promise for development to senior rank in teaching and research. There are also interdisciplinary research opportunities in such areas as modeling, health sciences, and game development.

Interested candidates are requested to complete the on-line application through the links starting at <https://www.twu.ca/human-resources/join-us>. Applications will be examined starting February 1, 2019, but will be accepted until a suitable candidate is found. In addition to your curriculum vitae, your online application should also include documentation outlining research and teaching interests and experience, teaching philosophy, course evaluations, and transcripts. Inquiries regarding this position may be sent to Professor Rick Sutcliffe, Acting Chair of the Mathematical Sciences Department, and Interim Dean of FNAS at rutc@twu.ca.

More information about Computing Science and Trinity Western's Department of Mathematical Sciences can be found at <http://www.twu.ca/academics/faculty-natural-applied-sciences/computing-science>.

Trinity Western University encourages applications from all eligible candidates who are able to commit to TWU's mission, values, **Statement of Faith** and **Community Covenant**. We do not discriminate, contrary to law, on the basis of any applicable prohibited ground of discrimination. We particularly invite applications from women, persons with disabilities, visible minorities, and indigenous people. All qualified candidates are encouraged to apply; however, Canadians and permanent residents will be given priority.

Trinity Western University is located on the traditional and ancestral territory of the Sto:lo people.



2019 Canadian Mathematical Society **Summer Meeting**

June 7 - 10, 2019

Deadline: February 15, 2019

University of Regina, Regina, Saskatchewan

CALL FOR SESSIONS

As of this summer, the CMS is organizing three-hour mini-courses to add more value to their meetings and make them attractive for students and researchers to attend.

The mini-courses will be held on Friday afternoon, June 7th, before the public lecture, and should be in 'hot topics' suitable for graduate students, postdocs and other interested parties. Ideally, subjects should be connected to one or more of the scientific sessions scheduled at the meeting.

As an appreciation to the lecturers, the CMS will offer:
1) free registration fee to the meeting or a free one year membership to the CMS, 2) a free banquet ticket, and
3) a gift.

Please contact tkousha@cms.math.ca if you have any questions or you are willing to offer a mini-course at the 2019 CMS Summer Meeting in Regina.

Proposals should be submitted by **March 1, 2019**.

Scientific Directors:

Allen Herman (University of Regina)
allen.herman@uregina.ca

Alexander Litvak (University of Alberta)
alitvak@ualberta.ca

Karen Meagher (University of Regina)
karen.meagher@uregina.ca

Réunion d'été de la SMC 2019

7 - 10 juin 2019

Date limite : 15 février 2019

Université de Regina, Regina, Saskatchewan

APPEL DE PROPOSITIONS DE SESSIONS

À partir de cet été, la SMC organisera des mini-cours de trois heures pour accroître l'attrait de ses Réunions et inciter plus d'étudiants et de chercheurs à y assister.

Les mini-cours auront lieu le vendredi 7 juin en après-midi, avant la conférence publique, et devraient porter sur des sujets d'actualité adaptés aux étudiants des cycles supérieurs, aux postdoctorants et aux autres personnes intéressées. Idéalement, les sujets devraient être liés à une ou à plusieurs des sessions scientifiques au programme de la Réunion.

En guise d'appreciation, la SMC offrira aux personnes qui donneront ces mini-cours : 1) l'inscription gratuite à la Réunion ou une année d'adhésion gratuite à la SMC; 2) un billet pour le banquet et 3) un cadeau.

Veuillez communiquer avec tkousha@cms.math.ca si vous avez des questions ou pour proposer de donner un mini-cours à la Réunion d'été 2019 de la SMC, qui se tiendra à Regina.

Ces demandes doivent nous parvenir au plus tard le
1 mars 2019.

Directeurs scientifiques :

Allen Herman (Université de Regina)
allen.herman@uregina.ca

Alexander Litvak (University of Alberta)
alitvak@ualberta.ca

Karen Meagher (Université de Regina)
karen.meagher@uregina.ca



2019 CMS Winter Meeting

December 6-9, 2019

Deadline: March 29, 2019

The Chelsea Hotel, Toronto, Ontario

CALL FOR SESSIONS

As of this summer, the CMS is organizing three-hour mini-courses to add more value to their meetings and make them attractive for students and researchers to attend.

The mini-courses will be held on Friday afternoon, December 6th, before the public lecture, and should be in ‘hot topics’ suitable for graduate students, postdocs and other interested parties. Ideally, subjects should be connected to one or more of the scientific sessions scheduled at the meeting.

As an appreciation to the lecturers, the CMS will offer: 1) free registration fee to the meeting or a free one year membership to the CMS, 2) a free banquet ticket, and 3) a gift.

Please contact tkousha@cms.math.ca if you have any questions or you are willing to offer a mini-course at the 2019 CMS Winter Meeting in Toronto.

Proposals should be submitted by **March 31, 2019**.

Scientific Directors:

Patrick Ingram (York University) pingram@yorku.ca

Jane Heffernan (York University) jmheffer@yorku.ca



Réunion d'hiver de la SMC 2019

6-9 décembre 2019

Date limite : 29 mars 2019

The Chelsea Hotel, Toronto, Ontario

APPEL DE PROPOSITIONS DE SESSIONS

LÀ partir de cet été, la SMC organisera des mini-cours de trois heures pour accroître l'attrait de ses Réunions et inciter plus d'étudiants et de chercheurs à y assister.

Les mini-cours auront lieu le vendredi 6 décembre en après-midi, avant la conférence publique, et devraient porter sur des sujets d'actualité adaptés aux étudiants des cycles supérieurs, aux postdoctorants et aux autres personnes intéressées. Idéalement, les sujets devraient être liés à une ou à plusieurs des sessions scientifiques au programme de la Réunion.

En guise d'appréciation, la SMC offrira aux personnes qui donneront ces mini-cours : 1) l'inscription gratuite à la Réunion ou une année d'adhésion gratuite à la SMC; 2) un billet pour le banquet et 3) un cadeau.

Veuillez communiquer avec tkousha@cms.math.ca si vous avez des questions ou pour proposer de donner un mini-cours à la Réunion d'hiver 2019 de la SMC, qui se tiendra à Toronto

Ces demandes doivent nous parvenir au plus tard le **31 mars 2019**.

Directeurs scientifiques :

Patrick Ingram (York University) pingram@yorku.ca

Jane Heffernan (York University) jmheffer@yorku.ca



The CMS congratulates the Inaugural Class of Fellows

The Inaugural Class of Fellows consists of 49 members from the Canadian mathematical community.

The Inaugural Class of Fellows was recognized at the CMS Winter Meeting Banquet, December 9, 2018.

Edward Barbeau
Martin Barlow
Michael Bennett
Edward Bierstone
George Bluman
David Borwein
David Boyd
Lia Bronsard
H.E.A (Eddy) Campbell
Kenneth R. Davidson
Donald Dawson
Gerda deVries
Michel Delfour
Michael Doob
Malgorzata Dubiel
Peter Fillmore
Ailana Fraser

Nassif Ghoussoub
Shawn Godin
Edgar Goodaire
Bernard Hodgson
Jacques Hurtubise
John Frederick Jardine
Joseph Khouri
Peter Lancaster
Anthony To-Ming Lau
Mark A. Lewis
Miroslav Lovric
Ram P. Murty
V. Kumar Murty
Richard Nowakowski
Renzo A. Piccinini
David G. Poole
Malabika Pramanik

La Société mathématique du Canada vous félicite la cohorte inaugurale de fellows

La cohorte inaugurale de fellows est constituée de 49 membres de la communauté mathématique canadienne; ils ont reçu leur nouveau titre lors du banquet de la Réunion d'hiver de la SMC le 9 décembre 2018.

Sherman D.
Riemenschneider
David L. Rodgers
Christiane Rousseau
Yvan Saint-Aubin
Thomas Salisbury
Bill Sands
Gregory G. Smith
Catherine Sulem
Srinivasa Swaminathan
Peter D. Taylor
Keith F. Taylor
James G. Timourian
J. Harley Weston
Robert E. Woodrow
Graham P. Wright

CMS ELECTION NOTICE

This year the CMS will be electing fifteen (15) officers and directors. Candidates have to agree to the nomination and provide the committee with biographical information.

You are invited to nominate members to be candidates and their nominations will be accepted by the Nominating Committee **prior to March 1, 2019** provided that each person nominated: (i) is supported in writing by at least five (5) other members of the CMS; and (ii) has given written acceptance to stand for office and to supply biographical information.

Nominations together with supporting materials should be e-mailed to nominations-2019@cms.math.ca or sent to:

Nominating Committee Chair
Canadian Mathematical Society
209 - 1725 St. Laurent Blvd.
Ottawa, ON K1G 3V4 Canada

Nominations are being solicited for the following slate of candidates for the Executive Committee (*length of elected term in parentheses*):

- President-Elect (1 year)/ President (2 years)/ Past-President (1 year);
- Vice-President – Atlantic (N.B., P.E.I., N.S., N.L.) (2 years);
- Vice-President – Quebec (4 years);
- Vice- President – Ontario (4 years);
- Vice-President – West (Alta., Sask., Man., N.W.T., Nunavut) (4 years);
- Vice-President – Pacific (B.C., Yukon) (2 years);

Nominations are also being solicited for Board of Directors members (*length of elected term in parentheses*):

- Atlantic – 1 member (4 years);
- Quebec – 2 members (4 years);
- Ontario – 2 members (4 years);
- West – 2 members (4 years);
- Pacific – 1 member (4 years); and
- Student – 1 member (2 years).

For 2019, the CMS will hold the election electronically in April and the results formally approved in June at the Annual General Meeting (AGM) in Regina, Saskatchewan. Updated information will be periodically e-mailed to members and posted on the CMS website at: <https://cms.math.ca/Elections/2019/>

David Pike
Chair, CMS Nominating Committee

AVIS D'ÉLECTION DE LA SMC

Cette année, la SMC élira quinze (15) dirigeants et administrateurs. Les candidats doivent s'entendre sur la nomination et de fournir au Comité des informations biographiques.

Vous êtes invités à nommer d'autres candidats et leurs nominations seront acceptées par le Comité des mises en candidature **avant le 1 mars 2019**, à condition que chaque personne nommée : (i) ait reçu l'appui par écrit d'au moins cinq (5) autres membres de la SMC; et (ii) ait accepté par écrit d'être candidat(e) et de fournir leurs renseignements biographiques.

D'autres nominations accompagnées des documents doivent être envoyées par courrier électronique à nominations-2019@smc.math.ca ou envoyées à :

Président du Comité des mises en candidature
Société mathématique du Canada
209 - 1725 boul. St. Laurent
Ottawa (Ontario) K1G 3V4 Canada

On demande des candidatures aux postes suivants au sein du Comité exécutif (*longueur du terme élu en parenthèse*) :

- Président élu (1 an)/ Président (2 ans)/Président sortant (1 an) ;
- Vice-président – Atlantique (N.-B., Î.-P.-É, N.-É., T.-N.-L.) (2 ans) ;
- Vice-président – Québec (4 ans) ;
- Vice-président – Ontario (4 ans) ;
- Vice-président – Ouest (Alb., Sask., Man., T.-N.-O., Nunavut) (4 ans) ; et
- Vice-président – Pacifique (C.-B., Yukon) (2 ans).

On demande également des candidatures aux postes suivants au sein du Conseil d'administration (*longueur du terme élu en parenthèse*) :

- Atlantique – 1 membre (4 ans) ;
- Québec – 2 membres (4 ans) ;
- Ontario – 2 membres (4 ans) ;
- Ouest – 2 membres (4 ans) ;
- Pacifique – 1 membre (4 ans) ; et
- Étudiant – 1 membre (2 ans).

Pour 2019, la SMC tiendra l'élection électroniquement en avril et les résultats seront formellement approuvés lors de l'assemblée générale annuelle (AGA) de la SMC en juin à Regina, Saskatchewan. Mises à jour des renseignements seront communiquées régulièrement par courrier électronique aux membres et affichées sur le site Web de la SMC à <http://smc.math.ca/Elections/2019/>.

David Pike
Président du Comité des mises en candidature

The Canadian Mathematical Society and Intact Foundation make Crux Mathematicorum available for free online



With the support of the Intact Foundation, the Canadian Mathematical Society (CMS) will be making Crux Mathematicorum (Crux), an internationally respected problem solving journal, available as a free online publication beginning this month. This initiative means every high school teacher and student in Canada and globally will be able to access Crux as a free resource.

Crux is produced 10 times per year and of particular interest to high school students and teachers who participate in various national and international competitions as well as to individuals who enjoy the challenge of solving sophisticated mathematics problems. Greater access to Crux will increase students' interest in mathematics, particularly for students in remote areas, as well as encourage more students to pursue mathematically dependant careers.

La Société mathématique du Canada et la Fondation Intact permettent la publication en ligne gratuite de Crux Mathematicorum

Grâce au soutien de la Fondation Intact, la Société mathématique du Canada (SMC) produira sa revue de résolution de problèmes de renommée internationale, (Crux), en accès en ligne gratuit à partir de ce mois-ci. Cette initiative permettra à tous les enseignants et élèves du secondaire du Canada et d'ailleurs d'accéder gratuitement au Crux.

Publié 10 fois l'an, le *Crux* est d'un intérêt particulier pour les élèves et les enseignants du secondaire qui participent à des concours nationaux et internationaux, ou pour toute personne qui aime résoudre des problèmes mathématiques complexes. En élargissant ainsi l'accès au *Crux*, on rehaussera l'intérêt des élèves pour les mathématiques, en particulier dans les régions éloignées, ce qui incitera davantage d'élèves à poursuivre des carrières axées sur les mathématiques.

If undelivered, please return to:
Si NON-LIVRÉ, veuillez retourner à :

CMS Notes / Notes de la SMC
209 - 1725 St. Laurent Blvd Ottawa, ON K1G 3V4 Canada