



Mathematical Congress of the Americas 2017 18

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CMS NOTES de la SMC

March-April /
mars-avril
2017

Vice-President's Notes / Notes du vice-président

David Pike (Memorial)

Vice-President – Atlantic / Vice-président – Atlantique



In Praise of Post-Docs

Éloge des postdoctorants

For recently and soon-to-be graduated PhD students, the opportunity of a Post-Doctoral position can be invaluable. It facilitates extended research experience in close collaboration with a new set of colleagues, both deepens and broadens one's knowledge, and often provides the chance to acquire some teaching experience. Some Post-Docs even come to be involved in the supervision of undergraduate research students. There are also often opportunities for Post-Docs to make themselves better known within the research community, not only through publishing their research but also by presenting at conferences and availing of other networking activities. And while being Post-Docs, people's curricula vitae develop accordingly, as research accomplishments and other experiences accumulate. When it comes to seeking academic employment as an Assistant Professor, it is almost a necessity that people have had Post-Doctoral experience if they are to successfully compete for tenure-track positions, especially at schools that have an emphasis on research.

I myself never had a Post-Doctoral position, but I have been fortunate to be able to supervise a number of talented Post-Docs. It has been especially rewarding to be able to learn from each other and to draw upon each other's expertise. I consider Post-Docs as junior colleagues who are in an advanced stage of apprenticeship, during which I try to offer advice and insight into various aspects of academia and career

pour les étudiants qui ont récemment obtenu leur doctorat et pour ceux qui l'obtiendront bientôt, la possibilité de faire un postdoctorat est inestimable. Ce type de poste facilite le prolongement de l'expérience de recherche en étroite collaboration avec de nouveaux collègues, ce qui permet d'approfondir et d'élargir ses connaissances, et offre souvent la possibilité d'acquérir une expérience d'enseignement. Certains postdoctorants en viennent même à superviser des étudiants chercheurs de premier cycle. Ils ont aussi l'occasion de mieux se faire connaître dans le milieu de la recherche, non seulement grâce à la publication de leurs travaux, mais aussi en présentant leur travail à des congrès et en profitant d'autres activités de réseautage. Et pendant qu'ils font leur postdoctorat, leur curriculum vitae s'étoffe en conséquence à mesure qu'ils font de la recherche et accumulent d'autres expériences. En ce qui concerne la recherche d'un emploi de professeur adjoint à l'université, l'expérience postdoctorale est presque une nécessité pour réussir à rivaliser avec les autres candidats et obtenir un poste menant à la permanence, en particulier dans les établissements qui mettent l'accent sur la recherche.

Pour ma part, je n'ai jamais fait de postdoctorat, mais j'ai eu la chance de superviser un certain nombre de postdoctorants talentueux. Ce fut une expérience particulièrement gratifiante d'apprendre les uns des autres et de tirer parti de l'expertise de chacun. Je considère les postdoctorants comme de jeunes collègues qui sont à un stade avancé de l'apprentissage

Alternative Facts

Robert Dawson, CMS Notes *Editor-in-Chief*



It takes a few weeks to get the NOTES into print, and a topical editorial always risks riffing off stale news. However, with speculation in the media that, the United States having set the fashion, Canada too might choose a reality TV star as our next leader, we cannot ignore events south of the border.

One of the strangest concepts to come out of the recently-elected American government is

that of “alternative facts.” A year ago, the closest that we came to having such a term was in the negative, in the form of U.S. Senator Daniel Moynihan’s aphorism that “you are entitled to your opinions, but you are not entitled to your own facts.” Today, it seems, some of Moynihan’s compatriots think that they are.

But aren’t alternative facts what mathematics is all about? Geometry can be elliptic, Euclidean, or hyperbolic. Whether you accept the axiom of choice in your work is up to you, with due regard to fashion in your field. The literature based on the assumption or denial of the Riemann conjecture would fill a large bookshelf.

But these are not alternative facts: these are alternative axiom systems. Even in pure mathematics, once the axioms are selected, what follows from them is a matter of fact, not of personal preference. Our facts are our deductions, and we take them as we find them. In applied mathematics, the importance of selecting the right model is recognized as paramount. Applying Euclidean geometry to the surface of the Earth in the large, or to the space around a massive body, simply won’t work. The inscription over the door of the temple of mathematics reads “Prove it!”

Now, the real world too has room for alternative axiom systems. If somebody really believes that the main task of government is to improve life for the wealthiest one percent or to benefit one particular industry at any cost to the environment, this cannot be disproved; one can only agree or disagree. But these divisions have always existed in society. Sometimes the outcomes have been what supporters expected, sometimes not. The idea of “alternative facts” is a different and sinister one. Not new - totalitarian governments through the years have found it useful, at least until they were in a position to stamp out the “other” alternatives.

It is not a coincidence that writers for many years have used basic arithmetic as a symbol of truth in its purest form. “Two and two are four/ And neither five nor three” wrote Housman, echoing Kipling, Chesterton, and many others. The alternative was illustrated by George Orwell:

“How many fingers, Winston?”

Les faits alternatifs

Robert Dawson, *Rédacteur en chef des Notes de la SMC*

Le processus de parution des Notes s’étend sur quelques semaines, aussi un éditorial portant sur l’actualité risque-t-il toujours de paraître dépassé. Cependant, étant donné les spéculations dans les médias voulant qu’à la suite des États-Unis, le Canada pourrait lui aussi choisir une vedette de téléréalité comme prochain chef, il nous est impossible d’ignorer ce qui se passe au sud de la frontière.

L’un des concepts les plus étranges qu’a inventés le nouveau gouvernement américain est celui des « faits alternatifs ». Il y a un an, ce qu’on avait entendu de plus proche de ce concept avait été énoncé sous la forme négative, quand le sénateur américain Daniel Moynihan avait dit « vous avez droit à vos propres opinions, mais pas à vos propres faits ». De toute évidence, certains compatriotes de M. Moynihan semblent aujourd’hui penser le contraire.

« Attention, pourrait-on dire, les faits alternatifs ne sont-ils pas au cœur même des mathématiques ? »? Après tout, la géométrie peut être elliptique, euclidienne ou hyperbolique. Moyennant le respect des usages de votre domaine, que vous acceptiez l’axiome de choix dans votre travail ne regarde que vous. Songez que l’on pourrait remplir tout un rayon avec les ouvrages tentant de confirmer ou d’inflimer l’hypothèse de Riemann.

Or, ce ne sont pas là des faits alternatifs, mais bien des systèmes axiomatiques différents. Même en mathématiques pures, une fois l’axiome sélectionné, ce qui en découle est un fait, et non une préférence personnelle. Nos faits sont nos déductions, et nous acceptons leur réalité. En mathématiques appliquées, il est primordial de sélectionner le bon modèle. Tenter d’appliquer la géométrie euclidienne à la surface de la Terre ou à l’espace entourant un corps massif ne fonctionnerait tout simplement pas. À l’entrée du temple des mathématiques, on peut lire cette injonction : « Prouvez-le ! »

Cela dit, il y a de la place dans le monde réel pour des systèmes axiomatiques différents. Si quelqu’un croit vraiment que la tâche principale du gouvernement est de faciliter la vie au 1 % le plus riche ou de privilégier un certain secteur sans égard au coût pour l’environnement, on ne peut pas réfuter sa croyance, on peut seulement être d’accord ou non. Ces divisions ont toujours existé dans la société. Parfois, les résultats sont à la hauteur des attentes des partisans, d’autres fois non. Mais l’idée des « faits alternatifs » est différente et sinistre. Pas qu’elle soit nouvelle : les gouvernements totalitaires l’ont toujours trouvée utile, du moins jusqu’à ce qu’ils soient en mesure de museler les voix concurrentes.

Ce n’est pas une coïncidence si les écrivains utilisent de longue date l’arithmétique élémentaire comme symbole de la vérité dans sa forme la plus pure. « Deux et deux font quatre, Pas cinq ni trois », écrivait Housman, à la suite de Kipling, de Chesterton et de bien d’autres. L’autre possibilité a été illustrée par George Orwell :

« Combien de doigts, Winston ? »

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.

2017 CMS MEMBERSHIP RENEWALS RENOUVELLEMENTS 2017 À LA SMC



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Le renouvellement pour l'an 2017 a commencé! S'il vous plaît renouveler votre adhésion en ligne dès que possible 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

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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.

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Continued from cover

development, including job seeking as well as what they might encounter when they eventually face such hurdles as promotion and tenure assessments. In addition to our collaborative research endeavours, it is good if they can pursue independent research projects as well. As I've already mentioned, developing a research portfolio is paramount, and being free (or mostly free) from having to teach, take classes, or serve on time-consuming committees provides Post-Docs with an excellent opportunity to do just that. If it isn't obvious, I highly recommend that fresh PhDs take advantage of Post-Doctoral opportunities if they are able to do so.

This brings me to my next point of discussion: how to find a Post-Doctoral position. There are two primary aspects to doing so, the first of which is identifying a location and supervisor(s). Occasionally Post-Doctoral vacancies are advertised via mathematical email mailing lists and departmental websites. However, my general impression is that a significant proportion of Post-Doctoral positions are arranged on an ad hoc basis through personal contacts and networking. While still a PhD student, it can help to make yourself known by attending conferences (including giving talks of your own), participating in workshops and summer schools, etc. These activities also help with getting to know who might be a suitable Post-Doctoral supervisor. Being able to discuss prospects in person is great if it can be arranged; otherwise reaching out to potential supervisors by email is an option. Getting the advice of one's PhD supervisor (who can also do some promotion on your behalf) is also worthwhile.

Post-Doctoral positions are not unpaid internships, which means that money has to be found somewhere by someone, typically either by the Post-Doctoral fellow or by her/his supervisor. That's the other major aspect involved in getting a Post-Doctoral position. If you are able to acquire your own funding, such as by obtaining a Post-Doctoral Fellowship from NSERC, then that not only provides an impressive addition to your curriculum vitae but it can also provide freedom and flexibility concerning where to take up a Post-Doctoral position. However, NSERC fellowships are very competitive; in Mathematics and Statistics about a dozen NSERC fellowships are awarded each year, and the eligibility criteria are such that only Canadian citizens or permanent residents can apply. There are various other sources of fellowship support, such as those offered by AARMS, CRM, Fields, PIMS and Mitacs. In several of these cases the fellowship is geographically restricted, and the financial contribution needs to be topped up from other sources. Some universities have their own institutional Post-Doctoral fellowships as well. In any case, be mindful that there may be deadlines that are substantially earlier than the intended start date of a Post-Doctoral position, so it is wise to investigate options sooner than later.

If the Post-Doctoral supervisor(s) will have to arrange any of the financial support, then giving her/him/them ample time to do so is also important. Speaking from my own experiences, one of the Post-Docs that I've worked with had her own fellowship from NSERC, but in each of the other cases it was necessary for me to secure funding with which to pay the Post-Doc's salary and employment benefits.

Occasionally I have managed to convince my Dean to provide some support, but this has gotten increasingly difficult over the years. Whenever possible I try to avail of whatever funding opportunities arise, but invariably my NSERC Discovery Grant is drawn upon to make up any shortfall that cannot be found elsewhere. As a slight aside, teaching stipends can also be of assistance, but practices and policies may vary from one school to another regarding the extent to which they can be leveraged; for instance, the current union contract at Memorial University stipulates that teaching stipends are separate from Post-Doctoral salaries, and so the full salary (and benefits) must be secured from other funding sources.

Having spoken with colleagues at various institutions, it seems that there is great variation in how Post-Doctoral positions are administered. There is also variation in the support mechanisms that are in place for providing financial assistance. A number of schools have well-established Post-Doctoral programs, whereas others seem to have little or no system in place to encourage Post-Doctoral activities. Sometimes a group of faculty members with common research interests will pool their funding to support a Post-Doc. For some researchers though, it just isn't feasible to support a Post-Doc unless the Post-Doc has a lucrative fellowship of her/his own. The disparity that this creates is an interesting one, especially in light of the impact that it can have for faculty who are seeking NSERC Discovery Grants.

Not long ago I served on the NSERC evaluation group for Mathematics and Statistics, and one of the things that struck me was that applicants who had benefitted from working with Post-Docs tended to fare better than those who had not. There is no rule that says that this should be so, but it is easy to see how this situation arises when considering the three criteria on which Discovery Grant applications are judged. For the "Excellence of Research" criterion, a hypothetical applicant who has been working with Post-Docs is prone to have more (and stronger) publications and other research outcomes than her/his hypothetical twin who has not been working with Post-Docs. For the "Merit of the Proposal" criterion, the applicant who is engaged with Post-Docs may have a more ambitious research proposal, with greater likelihood of success and impact than applicants who do not integrate Post-Docs into their proposal. And for the "Highly Qualified Personnel" factor, it should be obvious that an applicant who mentors Post-Docs may score better than one who lacks such background. With each of the three criteria being potentially affected, it is not hard to imagine that researchers who train Post-Docs have a good chance to obtain larger grants than their peers who have not been able to work with Post-Docs.

On that note I will recommend to university administrators that they should do what they can to maintain (or, if need be, to establish) Post-Doctoral programs. In addition to the benefits that I've already mentioned, an active Post-Doctoral program serves to raise the profile and enrich the environment of the host institution, not only in terms of research but also in terms of exposing graduate and undergraduate students to a diversity of expertise and cultures.

Suite de la couverture

et je tente de leur offrir des conseils et un aperçu de divers aspects du milieu universitaire et de la progression professionnelle, y compris la recherche d'emploi. J'essaie aussi de leur donner une idée de ce à quoi ils pourraient être confrontés lorsqu'ils feront finalement face à des écueils comme les évaluations pour obtenir une promotion ou la permanence. En plus de participer à nos efforts de recherche collaborative, c'est une bonne idée de poursuivre aussi des projets de recherche indépendants. Comme je l'ai mentionné, la constitution d'un dossier de recherche est primordiale, et l'absence (ou la quasi-absence) d'obligation d'enseigner, de suivre des cours ou de siéger à des comités chronophages donne aux postdoctorants une excellente occasion de se consacrer uniquement à cela. Si ce n'est pas évident, je recommande fortement aux doctorants frais émoulus de profiter des possibilités postdoctorales s'ils sont en mesure de le faire.

Cela m'amène à mon prochain sujet de discussion : comment trouver un poste de chercheur postdoctoral. Il y a deux principaux aspects à considérer, le premier étant la détermination d'un lieu et l'identification d'un ou de plusieurs directeurs. Les postes vacants sont parfois annoncés dans des listes de diffusion électronique et sur les sites web des départements de mathématiques. Cependant, j'ai l'impression qu'en général, bon nombre de ces postes sont pourvus de façon ad hoc grâce aux contacts personnels et au réseautage. Pendant que vous êtes encore étudiant au doctorat, cela peut être utile de vous faire connaître en participant à des congrès (y compris en prononçant des conférences vous-même), à des ateliers, à des écoles d'été, etc. Ces activités vous feront également connaître des directeurs potentiels et vous aideront à déterminer celui qui pourrait vous convenir. C'est fantastique de pouvoir discuter en personne, si une rencontre peut être organisée; sinon, vous pouvez aussi communiquer avec les directeurs potentiels par courriel. Obtenir les conseils de son directeur de thèse (qui peut aussi promouvoir votre candidature) est également utile.

Les postes de chercheur postdoctoral ne sont pas des stages non rémunérés, ce qui signifie que quelqu'un quelque part doit trouver l'argent pour vous payer, généralement soit le boursier postdoctoral, soit son directeur. C'est l'autre aspect majeur de l'obtention d'un tel poste. Si vous êtes en mesure d'obtenir votre propre financement, par exemple grâce à une bourse postdoctorale du CRSNG, cela constitue non seulement un ajout impressionnant à votre curriculum vitae, mais cela peut aussi vous conférer une certaine liberté et une certaine flexibilité quant à l'endroit où vous effectuerez votre postdoctorat. Cependant, les candidats aux bourses du CRSNG font face à une compétition féroce; en mathématiques et en statistique, environ une douzaine de bourses du CRSNG sont décernées chaque année, et les critères d'admission sont tels que seuls les citoyens canadiens ou les résidents permanents peuvent présenter une demande. Il existe diverses autres sources de financement sous forme de bourses, comme celles offertes par l'AARMS, le CRM, l'Institut Fields, le PIMS et le MITACS. Dans plusieurs de ces cas, la bourse impose des limites géographiques, et la contribution financière doit être complétée par d'autres

sources. Certaines universités ont aussi leurs propres bourses postdoctorales. Dans tous les cas, soyez conscients que les dates limites peuvent tomber bien plus tôt que la date de début prévue du postdoctorat; il est donc sage d'explorer les possibilités sans attendre.

Si le directeur du postdoctorat doit obtenir tout le soutien financier, il serait judicieux de lui donner suffisamment de temps pour le faire. En ce qui me concerne, l'une des postdoctorantes avec laquelle j'ai travaillé avait sa propre bourse du CRSNG, mais dans tous les autres cas, j'ai dû obtenir du financement pour payer le salaire et les avantages sociaux du postdoctorant. Il m'est arrivé de convaincre mon doyen de fournir un certain soutien, mais c'est devenu de plus en plus difficile au fil des ans. Chaque fois que c'est possible, je tente de profiter des occasions de financement qui se présentent, mais, invariablement, je puise dans ma subvention à la découverte du CRSNG pour compenser tout manque à gagner qui ne peut pas être comblé par d'autres sources. Les fonds d'assistantat d'enseignement peuvent également s'avérer utiles, mais les pratiques et les politiques varient d'un établissement à l'autre en ce qui concerne la capacité de mise à profit de ces fonds; par exemple, la convention collective actuelle à l'Université Memorial stipule que les rémunérations d'assistantat sont différentes des salaires des postdoctorants, en conséquence, la rémunération totale (y compris les avantages) doit provenir d'autres sources de financement.

Après avoir parlé à des collègues de différents établissements, je constate qu'il semble exister une grande variété de façons d'administrer les postes de chercheur postdoctoral. Les mécanismes d'appui mis en place pour fournir une aide financière sont également variés. Un certain nombre d'écoles ont des programmes postdoctoraux bien établis, alors que d'autres semblent avoir peu ou pas de système en place pour encourager les activités postdoctorales. Parfois, un groupe de membres du corps professoral ayant des intérêts de recherche similaires mettront en commun leurs fonds pour soutenir un postdoctorant. Pour certains chercheurs, cependant, il est tout simplement impossible de le faire à moins que le postdoctorant n'ait obtenu lui-même une bourse lucrative. La disparité que cela crée est intéressante, surtout à la lumière de l'impact que cela peut avoir pour les professeurs qui cherchent à obtenir des subventions à la découverte du CRSNG.

Il n'y a pas longtemps, en tant que membre du groupe d'évaluation du CRSNG pour les mathématiques et les statistiques, j'ai constaté avec étonnement que les candidats ayant eu la possibilité de collaborer avec des postdoctorants s'en sortaient généralement mieux que les autres. Aucune règle ne dit que cela devrait être le cas, mais il est facile de comprendre pourquoi cette situation se produit lorsque l'on considère les trois critères à partir desquels les demandes de subvention à la découverte sont évaluées. Pour le critère de « l'excellence en recherche », un candidat hypothétique qui a travaillé avec des postdoctorants est enclin à avoir plus de publications (plus solides) et plus d'autres résultats de recherche que son jumeau hypothétique qui n'a pas travaillé avec des

Suite à la page 7

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.

Denise Charron, Canadian Mathematical Society,
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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.

Denise Charron, Société mathématique du Canada
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MARCH 2017 MARS

- 5-10** BIRS Workshop: **Optimization and Inference for Physical Flows on Networks**, BIRS, Banff, Alta.
- 6-10** AARMS Workshop: **Hopf Algebras and Their Generalizations from a Categorical Point of View**, Memorial University, St. John's, NL
- 7-9** Fields Special Lecture Series: **Littlewood Lecture Series: Robert Vaughan**, Fields Institute, Toronto, Ont.
- 9-12** Fields Workshop: **Algebraic Varieties With a Special Emphasis on Calabi-Yau Varieties and Mirror Symmetry**, Fields Institute, Toronto, Ont.
- 9** PIMS-UManitoba Distinguished Lecture: **Vern I. Paulsen**, University of Manitoba, Winnipeg, Man.
- 10** PIMS/UBC Distinguished Colloquium: **Michel Brion**, University of British Columbia, Vancouver, B.C.
- 12-17** BIRS Workshop: **Mathematical Approaches to Evolutionary Trees and Networks**, BIRS, Banff, Alta.
- 13-17** Fields Workshop: **Efficient Congruencing and Translation-invariant Systems**, Fields Institute, Toronto, Ont.
- 19-24** BIRS Workshop: **Communication Complexity and Applications**, BIRS, Banff, Alta.
- 23** PIMS/ UBC Distinguished Colloquium: **Barry Simon**, University of British Columbia, Vancouver, B.C.
- 24-28** CRM: **Nirenberg Lectures in Geometric Analysis at the CRM by Camillo De Lellis (Universität Zürich)**, CRM, Montreal, Que.
- 27-Apr 7** CRM School and Workshop: **Combinatorics on Words and Tilings**, CRM, Montreal, Que.

APRIL 2017 AVRIL

- 2-7** BIRS Workshop: **Mostly Maximum Principle**, BIRS, Banff, Alta.
- 6** PIMS-UBC Statistics Constance van Eeden Lecture Series: **Jeffrey Rosenthal**, University of British Columbia, Vancouver, B.C.

- 9-14** BIRS Workshop: **Generated Jacobian Equations: from Geometric Optics to Economics**, BIRS, Banff, Alta.
 - 16-21** BIRS Workshop: **Geometric Structures on Lie Groupoids**, BIRS, Banff, Alta.
 - 23-28** BIRS Workshop: **Quantum Field Framework for Structured Light Interactions**, BIRS, Banff, Alta.
 - 24-May 5** Aisenstadt Chair: **Boris Adamczewski**, CRM, Montreal, Que.
 - CRM School and Workshop: **Bridges between Automatic Sequences, Algebra and Number Theory**, CRM, Montreal, Que.
 - 30-May 5** BIRS Workshop: **Phase Transitions Models**, BIRS, Banff, Alta.
- ## MAY 2017 MAI
- 5** 2017 Math. Horizons Day, University of Ottawa, Ottawa, Ont.
 - 7-12** BIRS Workshop: **Rigorous Numerics for Infinite Dimensional Nonlinear Dynamics**, BIRS, Banff, Alta.
 - 14-19** BIRS Workshop: **Algebraic Combinatorixx 2**, BIRS, Banff, Alta.
 - 21-26** BIRS Workshop: **Recent Advances in Discrete and Analytic Aspects of Convexity**, BIRS, Banff, Alta.
 - 23-25** Canadian Abstract Harmonic Analysis Symposium, University of Manitoba, Winnipeg, Man.
 - 25-27** Theory Canada 12 Conference, York University, Toronto, Ont.
 - 25-28** Graduate Summit in Mathematical Biology and Applied PDE, Palisades Centre, Jasper National Park, Alta.
 - 27-Jun 2** CSHPM 2017 Annual Meeting, Ryerson University, Toronto, Ont.
 - 28-Jun 2** BIRS Workshop: **Arithmetic Aspects of Explicit Moduli Problems**, BIRS, Banff, Alta.
 - 29-Jun 9** CRM School and Workshop: **Algebraic and Geometric Combinatorics of Reflection Groups**, CRM, Montreal, Que.

JUNE 2017 JUIN

- 2-5** 2017 Prairie Discrete Math Workshop, Living Skies Conference Centre, Lumsden, Sask.
- 2-6** CMESG (Canadian Mathematics Education Study Group) Conference, McGill University, Montreal, Que.
- 4-9** BIRS Workshop: **Mathematical Analysis of Biological Interaction Networks**, BIRS, Banff, Alta.
- 5-30** PIMS-CRM Summer School in Probability, University of British Columbia, Vancouver, B.C.
- 11-16** BIRS Workshop: **Connections in Geometric Numerical Integration and Structure-Preserving Discretization**, BIRS, Banff, Alta.
- 12-15** CanaDAM 2017, Ryerson University, Toronto, Ont.
- 12-23** CRM School and Workshop: **Equivariant Combinatorics**, CRM, Montreal, Que.
- 18-23** BIRS Workshop: **Nilpotent Fundamental Groups**, BIRS, Banff, Alta.
- 25-30** BIRS Workshop: **Mathematical Approaches to Interfacial Dynamics in Complex Fluids**, BIRS, Banff, Alta.

JULY 2017 JUILLET

- 2-7** BIRS Workshop: **Diophantine Approximation and Algebraic Curves**, BIRS, Banff, Alta.
- 7-9** BIRS: **Special Western Canada Linear Algebra meeting**, BIRS, Banff, Alta.
- 10-21** SMS 2017 Summer School: **Contemporary Dynamical Systems**, CRM, Montreal, Que.
- 12-23** International Mathematical Olympiad, Rio de Janeiro, Brazil
- 16-21** BIRS Workshop: **Women in Control: New Trends in Infinite Dimensions**, BIRS, Banff, Alta.
- 16-22** CT 2017: **International Category Theory Conference**, University of British Columbia, Vancouver, B.C.
- 17-21** CAIMS Annual Meeting 2017, Dalhousie University, Halifax, NS
- 19-23** Canadian Undergraduate Mathematics Conference 2017, Université de Montréal, Montreal, Que.
- 20-21** 12th East Coast Combinatorics Conference, Memorial University, St. John's, NL
- 23-28** BIRS Workshop: **Mean Dimension and Sofic Entropy Meet Dynamical Systems, Geometric Analysis and Information Theory**, BIRS, Banff, Alta.
- Mathematical Congress of the Americas and CMS Summer Meeting**, Centre Mont-Royal and McGill University, Montreal, Que. **Registration is now Open!**
- 24-28** Congrès mathématique des Amériques et Réunion d'été de la SMC, Centre Mont-Royal et Université McGill, Montréal, Qué. **La période d'inscription est ouverte!**

Notes du Vice-président, suite de la page 5

postdoctorants. Pour le critère du « mérite de la proposition », le candidat qui travaille avec des postdoctorants peut avoir un projet de recherche plus ambitieux, avec une plus grande probabilité de succès et des répercussions plus importantes que ceux qui n'incluent pas de postdoctorants dans leur proposition. Et pour le facteur « personnel hautement qualifié », il devrait être évident que le demandeur qui mentore des postdoctorants peut avoir une meilleure note que celui qui n'a pas ce type d'expérience. Étant donné que chacun des trois critères est susceptible d'être affecté, on comprend facilement que les chercheurs qui forment des postdoctorants ont une bonne chance d'obtenir des subventions plus importantes que leurs pairs qui n'ont pas été en mesure de travailler avec des postdoctorants.

À ce propos, je recommande aux administrateurs universitaires de faire ce qu'ils peuvent pour maintenir (ou, le cas échéant, mettre en place) des programmes de postdoctorat. En plus des avantages que j'ai mentionnés, un programme postdoctoral actif améliore l'image de l'établissement d'accueil et enrichit son environnement, non seulement en ce qui a trait à la recherche, mais aussi à l'exposition des diplômés et des étudiants de premier cycle à une diversité de compétences et de cultures.

Did You Know that CMS Membership has several benefits including discounts?

- 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 ?

- Les départements peuvent parrainer l'adhésion de leurs étudiants
- 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 reciprocité avec la SMC
- Jusqu'à 50% réduction sur les publications
- Inclus notre bulletin – *Notes de la SMC*

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)

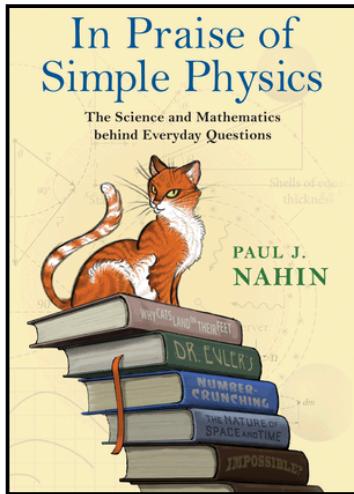
In Praise of Simple Physics: The Science and Mathematics behind Everyday Questions

By Paul J. Nahin

Princeton University Press, 2016

ISBN 978-0691166933

Reviewed by Yvan Saint-Aubin, Université de Montréal



The book jacket presents a proud cat sitting on a skewed pile of books. This drawing gave me the impression that the book might be a popularization. However, flipping through the pages I saw that most of the text is filled with equations and technical discussions. These conflicting impressions led me to read the Preface. It was a wise move as the Preface is a must read! It explains what you are getting into, it's full of nice stories, offers two challenges and directs you to Chapter 1. Indeed, the author informs you candidly that the latter allows you to assess your readiness for what follows. If it is not too difficult, then the rest of the book will be accessible. How does Chapter 1 measure your readiness? It does it by stating and solving nine short problems, some algebraic, geometric, some trying to get a good approximation to a given number, some with and other without physics. One example uses Stirling approximation of the factorial function, and its mathematical sophistication seems to me to be beyond the math requirement for the book. But otherwise Chapter 1 does offer an honest cross-section of what is to come.

I read eight of the 23 chapters of *In Praise of Simple Physics*. Even though each of the chapters I read was conceived as independent of the others, some refer to results obtained in previous chapters.

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 le bienvenue.

Karl Dilcher, Dalhousie University (notes-critiques@smc.math.ca)

When they do, the text introduces them well, and reading the previous chapter is not necessary. Several of those I read revolve around objects in circular motion and the concept of moment of inertia. My PhD is in physics, but I teach now in a department of mathematics. I have never taught any of the elementary material discussed in Nahin's book, nor followed the evolution of their pedagogical treatment. (One may not realize that, over a quarter of a century, the way we teach certain concepts evolves and improves!) Hence I cannot say whether Nahin's arguments are his or the fruit of this slow but steady evolution. But I was very pleased by many of his presentations (the very basic introduction of the centripetal force provides one example).

So, along the course of the chapters, I learned (or was reminded) about natural facts like: which of the sun or the moon exerts the greatest gravitational force on the earth? Which one produces the largest tidal effect? What would be the power released if one could harness the energy lost in the friction of tides? And Nahin's solutions of many other easily stated problems are simple as well, often elegant, and they carefully go through all the mathematical steps. They might even lead the beginner to think that physics is easy. One of the great difficulties of physics is to find the physical properties that drive the phenomenon studied and do the right approximations. The abilities to perform these two steps are now becoming more common in the mathematics curriculum due to the appearance of modelling courses. They are hard to develop and, if this book has a weakness, it lies in the fact that it hides the "modelling" difficulties. But, to be fair, this is not the goal of the book. Instead the goal is to show a wide variety of problems that can be tackled with basic physics.

So, who is the intended audience of this book? Is it dedicated undergraduates? Maybe. Is it instructors of first- and second-year courses? The book is definitely a great source of physics problems, both beautiful and elementary. Is it aimed at people, young and old, who have a good background in science and miss the experience of solving a good physics problem? Quite probably! And these people will be delighted by Nahin's book. Of course, there are a few typos. But they are minor. (When they are mathematical, those I found were corrected in the course of the computation. They were not disruptive. And, by the way, Leibniz was German, not French.)

When Nahin is busy solving the problem at hand, his style is concentrated and to the point. When he is luring his reader into a new physical twist, he is a witty story teller. These two styles make the book lively. Add to that the compendium of compelling physics problems and their remarkably simple solutions, and you get a very attractive book!

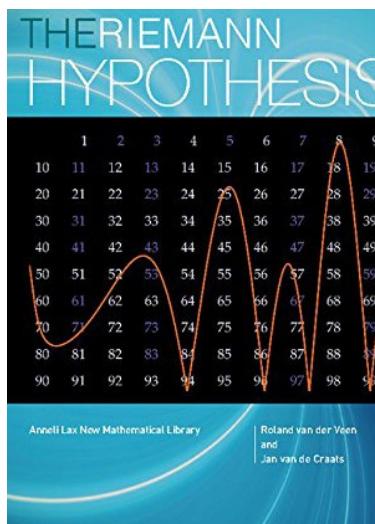
The Riemann Hypothesis

By Roland van der Veen and Jan van de Craats

MAA, 2016

ISBN 978-0-88385-650-5

Reviewed by Michael J. Mossinghoff, Davidson College



the last 150 years, and one can find many fine texts and monographs in analytic number theory written for graduate students and seasoned researchers interested in this problem.

This remarkable text aims to introduce this famous problem to another audience: mathematically talented secondary school students. It assumes its readers have some knowledge of essential calculus—essentially just the notion of a limit, and facility with basic differentiation. Knowledge of integration is not required, except for a lone optional exercise that introduces the logarithmic integral $Li(x)$ and its relationship to the Prime Number Theorem. The book originated from a month-long on-line course for secondary school students administered by the University of Amsterdam. Each of its four chapters corresponds to the topics covered in this course in one week.

The first chapter introduces the prime-counting function $\pi(x)$, and empirically tests how well its values match against various simple functions before stating the famous Prime Number Theorem, which asserts that $\pi(x)$ grows asymptotically like $x/\ln(x)$. It then defines Chebyshev's function $\psi(x)$ in the usual way as a particular weighted sum over the prime powers less than or equal to x . This is the principal object of study of this text, since its well-known explicit formula involving the zeros of the zeta function leads to the statement of the Riemann hypothesis in a natural way. Chapter 2 introduces infinite sums and questions of convergence and divergence, covering

geometric and harmonic series before introducing the Riemann zeta function for a real parameter $x > 1$, where convergence is assured. Euler's product formula for $\zeta(x)$ is then developed, as well as his famous formula for $\zeta(2)$. Chapter 3 discusses the analytic continuation of the zeta function, first to the real interval $(0, 1)$ by way of the Dedekind eta function, and then to complex values in the half-plane $Re(z) > 0$, after a “crash course” on complex numbers. This allows the authors to state the Riemann hypothesis as a statement about the location of the nontrivial zeros of the zeta function. The final chapter states Riemann's functional equation without proof, which allows the authors to complete the analytic continuation of the zeta function to the entire complex plane, save of course for the simple pole at 1. They state the explicit formula for the Chebyshev $\psi(x)$ function in terms of the zeros of the zeta function, and derive some equivalent forms for this, for instance by evaluating the contribution over the trivial zeros explicitly. This chapter culminates with a sketch of the classical, complex-analytic proof of the Prime Number Theorem, which establishes that the zeta function has no zeros on the critical line.

Each chapter includes a substantial number of exercises, many of which incorporate several parts that lead the reader through lengthier arguments. Four appendices introduce the RSA cryptosystem, provide a guide for using Wolfram Alpha or Sage when working the exercises, point the reader to accessible publications and websites on the Riemann hypothesis, and present full solutions to all of the exercises in the textbook.

Due to its targeted audience, the text necessarily circumvents a few topics that are beyond its scope. For example, the gamma function, which appears in Riemann's functional equation for the zeta function, is not developed, since knowledge of integral calculus is not assumed in the book. To compensate, the authors employ a slight change of variables in their functional equation relative to what is normally encountered in textbooks, allowing them to replace the usual gamma function term with a “ $!$ ” factor, and they describe this extension of the factorial function in general terms. This reviewer can also quibble that the wonderful quote often attributed to Erdős that concludes the body of the text (“God may not play dice with the Universe, but there's something strange going on with the prime numbers!”) did not actually originate with him, but instead first arose in a talk given by Carl Pomerance in Erdős' memory.

The text is very well-written, and succeeds admirably in presenting the Riemann hypothesis to an audience of mathematically talented secondary school students in less than 90 pages. It will undoubtedly be a terrific resource for such students in the future, as well as undergraduate students in mathematics seeking an introduction to attractive and central topics in analytic number theory.

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.

Jennifer Hyndman, University of Northern British Columbia
(hyndman@unbc.ca)

John McLoughlin, University of New Brunswick
(johngm@unb.ca)

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 le bienvenue.

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John McLoughlin, University of New Brunswick
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This issue opens with a glimpse on teaching pertinent to any of us who find ourselves teaching varying groups in what officially appears to be the same course. Tensions concerning fairness and expectations emerge. The piece reflects the authors' experiences and a discussion session from a teaching and learning conference. The article is followed by a preliminary program announcement for the 2017 CMESG/GCEDM Meeting.

(Dis)advantaging students with assessment decision-making

Ryan Jones and John McLoughlin,
(*Faculty of Education, University of New Brunswick*),
from the 2013 AAU Teaching Showcase, Sackville, NB

The calendar description looks identical. The course number has not changed. But the students have and so what? Do you really assess the same when the classes are so markedly different? Do you even have the same expectations of all students? Or do you find that the goals of teaching and learning shift depending upon the collective, the individual, or the role of the course? Our experiences suggest that many layers need to be unearthed in answering such questions. For instance, teachers' (un)familiarity with students is a factor that will be discussed.

Who teaches the class? What does the grade mean? This session will feature discussion around the messiness and conundrums that exist as we strive to teach effectively, knowing that assumptions implicit to our interpretation of a grade, such as relationship, accommodation, flexibility, and the like, all muddy its meaning. The main objectives are two-fold: to consciously raise awareness of these issues and their implications, and to offer teachers ideas that may be helpful in addressing the realities in one's practice.

Are we comfortable with accepting that assessment is not consistent? How do our objectives and beliefs in teaching affect the forms and interpretations of assessment? How do we (dis)advantage students through assessment decisions made within all facets of a course?

We, Ryan Jones and John McLoughlin, co-taught ED 3415, *Developing Numeracy*, a math education elective in the B.Ed. program at University of New Brunswick (UNB) in Winter 2013. This course was, at the time, taught once or twice a year, but with widely varying constituencies. This particular offering extended over the full term with the class made up of students who were

uncomfortable with mathematics. Some of the students were very anxious, whereas others wanted this course as a means of continuing mathematical development as they had taken significant steps forward in the required math education course in Fall 2012. It is critical to note that John taught that course, and Ryan facilitated weekly tutorials with the students in addition to participating in evaluations and offering additional individual/small group tutoring sessions. The course ED 3415 was not scheduled to be offered in the Winter until several of the students, all of them among those who participated in the tutorials, spoke up to request another math offering in their program. The class went ahead with 12 students, two of whom were not in the fall course as they took the elective as part of the First Nations Teacher Education Program. It should be noted that the one scheduled section of ED 3415 was to be a one-week intersession intensive geared to students who are strong at mathematics, including many in the secondary math option.

The nature of our professional relationship has taken many forms ranging from student-professor to colleagues, including the co-teaching of ED 3415. The majority of our interactions have actually grown out of mathematical outreach with perhaps one hundred mathematics outreach visits/presentations in classrooms or other settings. As a graduate student during 2012-2013, Ryan's academic work continually shifted toward matters of context and relationship. Hence, conversations commonly moved into the issues surrounding ED 3415 and ultimately, the AAU discussion. The discussion in Sackville pushed us to take the discussion beyond our own familiar spaces and informal conversations to a more organized level.

In Sackville, the afternoon discussion of approximately one hour provided opportunity for about 15 people to contribute ideas around this topic. The session was entirely discussion oriented following a brief introduction reflecting the context described above. Participants were primarily faculty at Atlantic universities, including at least one administrator. An undergraduate student volunteer from Mount Allison also played an active role in the discussion.

The details of the discussion are not provided here, as that was never the intention. Rather the key ideas are outlined in the subsequent section so as to both provoke discussion and offer insight into the concepts or issues at hand.

What does it look like to (dis)advantage students?

Suppose that two students are in the same course, one with plans to pursue a program building upon the course, and another who is meeting a requirement for graduation. Should the course be tailored the same way, and assessed identically for these two people? What if it turns out that the students both perform at marginal levels? Does the same grade mean the same thing? The transcript may show the same grade, but could it be that the student not needing to build upon the course may be satisfied while their counterpart is likely ill-prepared for success in a subsequent course. Likewise, when pass/fail decisions arise for borderline students, do you consider other factors than simply the fact that their grade is on the bubble? If so, then we would say that you are advantaging some and disadvantaging others by virtue of what you determine to be the criteria in that circumstance. This claim may seem strong to some; however, it is being used to illustrate what is meant by the idea of (dis)advantaging students. It is not a judgment but rather an acknowledgment of the complexities of assessment decision-making that appear as a simple representation on a transcript. As professionals we are continually exercising judgments that fit within our own beliefs and represent the best of our abilities to evaluate. Measurement and evaluation are by nature imperfect, and the human elements figure into the imperfection.

Equality and fairness also get muddled in this discussion. The reality is that we feel that fairness takes priority over equality. That is, we strive to be fair while acknowledging the interpretation from a transcript may suggest equality.

Thoughts and reflections

Mathematicians are commonly associated with posing and solving problems. Lesser known perhaps is that many problems are unsolved, and likely are meant to remain that way. The discussion here from our perspective is much like the idea of an unsolvable

problem within the constraints of the field of education. Rather we strive to develop insights into the problem without an expectation of actually solving it. That is, the intention is to collectively heighten awareness of how students are (dis)advantaged, something that we all realize is happening when pausing to think about it. Meanwhile, it is anticipated that our individual understandings are sharpened through such focused attention.

Some of the discussants may be comfortable with this perspective of unsolvability, whereas others may conceive of the issue at hand as one to be solved. Whether one is looking for a solution (a "fix") or instead a way of coping with the challenge changes both the tone of discussion and the value of what took place that afternoon. Some people surely left contented from participating in a rich discussion, and most probably found the topic to be more complex than imagined. Whether such realization is enriching or frustrating is personal.

Though aspects of the many contexts and observations may resonate with each discussant it is evident that gaps or boundaries still exist. Ultimately there is a place at which we may agree to disagree. The same assessment issues may be present in our own situations but as we shift between contexts they appear much differently. The language and the ways we describe our observations often depend on our own context and therefore, are received differently by those outside of that context. In fact, writing makes this clear with the challenge of bringing the context of the discussion to the reader who was not present.

*Ryan Jones presently teaches in Stanley Consolidated School in New Brunswick. Some of the ideas presented here intertwine with his Master's report entitled *The Development of a Beginning Teacher: Observations from Mathematical Teaching and Outreach* (2013). His email address is jones.ryanscott@gmail.com.*

John McLoughlin is a Professor in the Faculty of Education at University of New Brunswick with a cross-appointment to the Department of Mathematics and Statistics. He is actively engaged in mathematical outreach particularly with elementary and middle schools. His email address is johngm@unb.ca.

2017 Graham Wright Award for Distinguished Service

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.

Nominations should include a reasonably detailed rationale and be submitted by **March 31, 2017**.

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

en français page 12

Canadian Mathematics Education Study Group (CMESG) / Groupe Canadien d'Étude en Didactique des Mathématiques (GCEDM)

41st Annual Meeting / 41^e rencontre annuelle, Université McGill, Montréal, Québec

June 2 to 6, 2017 / Du 2 au 6 juin 2017

Preliminary Program / Programme abrégé

[Final detailed program will be available in March / Le programme détaillé sera disponible en mars]

<http://www.cmesg.org/>

Plenary speakers / Conférences Plénierées:

Yvan Saint-Aubin (Université de Montréal): The most unglamorous job of all: Writing mathematics exercises / Écrire des exercices de maths: tâche ingrate entre toutes

Annie Selden (New Mexico State University): 40+ Years of Teaching and Thinking about University Mathematics Students, Proofs, and Proving / 40+ années d'enseignement et de réflexion au sujet des étudiants universitaires en mathématiques, des preuves et de l'acte de prouver

Elder Talk / La parole aux anciens:

Joel Hillel

Panel Topic / Table ronde:

The most important question about life and mathematics / La question la plus importante sur la vie et les mathématiques
 Panelists / Participants et participantes: Annette Braconne-Michoux, Stewart Craven, Denis Tanguay and David Reid; Coordinator / Chair / Modérateur: Miroslav Lovric

Topic Sessions / Séances thématiques:

France Caron (Université de Montréal): Modelling Mathematical Modelling / Modéliser la modélisation mathématique

Joyce Mgombelo (Brock University): Collective learning: Re-thinking the environment, artifacts and classroom interactions / Apprentissage collaboratif: Re-penser l'environnement, les artefacts et les interactions en classe

John Selden (New Mexico State University): A Psychological View of Teaching Proof Construction / Point de vue psychologique sur l'enseignement de la construction de preuves

Working Groups / Groupes de travail:

Working Group A (Wes Maciejewski, Ann Arden, and Nadia Hardy): Teaching first year mathematics courses in transition from secondary to tertiary / Enseigner les cours de mathématiques de première année universitaire en transition avec le secondaire ou le collégial

Working Group B (Jo Towers, Manon LeBlanc, and Jamie Pyper): Elementary preservice teachers and mathematics anxiety: New responses to enduring issues / L'anxiété mathématique chez les futurs enseignants du primaire: de nouvelles réponses à des enjeux qui perdurent

Working Group C (Egan Chernoff, Judy Larsen, and Viktor Freiman): Social Media and Mathematics Education / Médias sociaux et enseignement des mathématiques

Working Group D (Doris Jeannotte and Lynn McGarvey): Quantitative Reasoning in the Early Years / Le raisonnement quantitatif dans les premières années du parcours scolaire

Working Group E (to be confirmed/à confirmer): Social, cultural, historical and philosophical tools for teaching / Outils sociaux, culturels, historiques et philosophiques pour l'enseignement

Working Group F (Peter Liljedahl, Richelle Marynowski and Sarah Dufour): Deep understanding of school mathematics: Implications for teacher education / Compréhension approfondie des mathématiques scolaires: Implications pour la formation des maîtres

Prix Graham-Wright pour service méritoire 2017

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.

Pour les mises en candidature prière de présenter des dossiers avec une argumentation convaincante et de les faire parvenir le **31 mars 2017** 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.

This year the CMS will be electing seventeen (17) 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 April 7, 2017** 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-2017@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:

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

Nominations are also being solicited for Board of Directors members:

- Atlantic – 2 members to be elected, one for a 4-year term and one for a 2-year term;
- Quebec – 2 members to be elected, each for a 4-year term;
- Ontario – 4 members to be elected, two for 4-year terms and two for 2-year terms;
- West – 1 member to be elected for a 4-year term;
- Pacific – 1 member to be elected for a 4-year term; and
- Student – 1 member to be elected for a 2-year term.

The staggered terms in this election are required in order to complete the transition to the Board structure that was initiated in 2015.

For 2017, the CMS will hold the election at the July Annual General Meeting (AGM) in Montreal, Quebec. Updated information will be periodically e-mailed to members and posted on the CMS website at: <https://cms.math.ca/Elections/2017>

If you are unable to attend the AGM, you can participate in the electronic advance poll coming in April.

Tom Salisbury

Chair, CMS Nominating Committee

Cette année, la SMC élira dix-sept (17) 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 7 avril 2017**, 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-2017@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 :

- Président élu ;
- Vice-président – Atlantique (N.-B., I.-P.-É, N.-É., T.-N.-L.) ;
- Vice-président – Québec ;
- Vice-président – Ontario ;
- Vice-président – Ouest (Alb., Sask., Man., T.-N.-O., Nunavut) ;
- Vice-président – Pacifique (C.-B., Yukon) pour un terme de 2 ans.

On demande également des candidatures aux postes suivants au sein du Conseil d'administration :

- Atlantique – 2 membres à élire, un pour un terme de 4 ans et un pour un terme de 2 ans ;
- Québec – 2 membres à élire pour un terme de 4 ans ;
- Ontario – 4 membres à élire, deux pour un terme de 4 ans et deux pour un terme de 2 ans ;
- Ouest – 1 membre à élire pour un terme de 4 ans ;
- Pacifique – 1 membre à élire pour un terme de 4 ans ; et
- Étudiant – 1 membre à élire pour un terme de 2 ans.

Les termes échelonnés de cette élection sont nécessaires pour achever la transition vers la structure du Conseil qui a été lancée en 2015.

Pour 2017, la SMC tiendra l'élection à l'assemblée générale annuelle (AGA) de la SMC en juillet à Montréal, Québec. 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/2017.f>

Si vous êtes dans l'impossibilité d'assister à l'AGA, vous pouvez participer au vote par anticipation électronique à venir bientôt.

Tom Salisbury

Président, Comité des mises en candidature de la SMC

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:

Amy Ackerberg-Hastings, Independent Scholar

(aackerbe@verizon.net)

Hardy Grant, York University [retired] (hardygrant@yahoo.com)

The Unreasonable Effectiveness of Logic

Thomas Drucker, University of Wisconsin–

Whitewater

One of the themes of recent work in the philosophy of mathematics is the idea of logical pluralism. This has come in for plenty of criticism on the grounds that it is absurd to consider more than one variety of logic. But the history of mathematics supplies a parallel case, which suggests that the pluralists are not necessarily misguided. Although it has not been common to worry about a plural for the noun 'logic', that worry may be the wave of the future.

For millennia Euclidean geometry bestrode the mathematical world like a colossus. Although the parallel postulate in some version may have been hard to swallow, it seemed to be a painful necessity. When Girolamo Saccheri published his *Euclides ab omni naevo vindicatus* ('Euclid absolved of every flaw') in 1733, he examined the consequences of alternatives to the parallel postulate and arrived at results that were clearly contrary to Euclidean geometry—but since some of those results just seemed indisputable to him, he argued that he had established the parallel postulate by a *reductio ad absurdum*.

In the nineteenth century, Janos Bolyai and Nicolai Ivanovich Lobachevsky pursued the same path as Saccheri but were not so easily dissuaded by the unfamiliarity of the results. The story of the origins of non-Euclidean geometry has often been told, and one of the consequences of the emergence of such geometries was the recognition that more than one geometry could be of interest at a time. It was not as though one geometry was the 'correct' one and the others had to be rejected. The issue of which geometry best fits the real world was a different question, and relativity theory may have suggested that hyperbolic geometry describes the universe on a large scale. Nevertheless, both Euclidean and non-Euclidean geometries continue to be pursued, and proofs of relative consistency have provided some reassurance that neither is about to blow up in the faces of geometers. [1]

One reason for bringing up this story is to respond to the article by Eugene Wigner entitled 'The Unreasonable Effectiveness of Mathematics in the Natural Sciences'. [2] Philosophers of mathematics have used Wigner's article as the basis for arguing that mathematics must be tightly intertwined with the universe, as otherwise it would not be able so helpfully to describe and predict in the world of the physicist. What the case of geometry suggests is

Les articles de la SCHPM présentent 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:

Amy Ackerberg-Hastings, Chercheuse indépendante

(aackerbe@verizon.net)

Hardy Grant, York University [retraité] (hardygrant@yahoo.com)

that there may not be just one 'mathematics' to apply to the world, and perhaps the effectiveness of the geometries chosen to fit the world is not unreasonable.

Over the last century mathematicians and logicians have suggested alternatives to the logic that had been accepted for millennia. Perhaps the best-known example remains the intuitionistic logic introduced by L.E.J. Brouwer as part of his critique of classical mathematics. Brouwer was inclined to put mathematics first and to let logic follow, contrary to the approach of Gottlob Frege (and most philosophers of mathematics). One consequence of Brouwer's reassessment of mathematical truth as something closer to the notion of provability was that the law of the excluded middle no longer held. From Brouwer's perspective, claiming that A or not-A was equivalent to saying that one had a proof of A or one had a proof of not-A, which is evidently not the case for many statements. [3]

The dispute over the legitimacy of Brouwer's alternative to classical logic raged fiercely in the 1920s, but mathematicians have found interpretations that make intuitionistic logic a little more genuinely 'intuitive'. Originally, the inclination to use an intuitionistic logic applied especially to statements about the infinite. Then computer scientists found that the constructive aspects of intuitionistic logic applied to the construction of programs. The appeal of intuitionism has spread outside of mathematics at the same time that it has not entirely captured the mathematical heart.

One of the developments in physics a century ago was quantum mechanics, whose correct interpretation remains a bone of contention today. If one tries to apply the standard logical connectives to statements about the location and momentum of electrons, the laws of logic no longer apply. Typically, one can think of statements as forming a Boolean algebra, a structure that applied to *classical* physics. Birkhoff and von Neumann's article 'The Logic of Quantum Mechanics' suggests that a different structure may better fit the application of logical connectives to statements in that sphere, namely, a lattice. [4] Exactly which sort of lattice best fits quantum mechanics is unlikely to be resolved while the interpretation of quantum mechanics as a whole is debatable, but the point is that classical logic has competition in the realm of the quantum.

Another, and broader, criticism of classical logic arises with regard to implication. We are taught early on that anything follows from a false statement, which provides a way of filling out the truth table for 'A implies B'. It is not just introductory students of logic who wonder whether such an all-purpose assessment of conditionals is appropriate. There is also the question of whether 'If $2 + 2 = 4$,

then the sum of the angles of a triangle [at least in the Euclidean case] is 180 degrees' should be considered true just because the two clauses are true. If one saw this conditional in a proof, one would be legitimately suspicious. As a result, 'relevance logic' worries about the kind of connection that exists between hypothesis and conclusion. Such a change calls the formality of formal logic into question, much to the consternation of some philosophers and the relief of others.[5]

These are not the only alternatives to classical logic that have been introduced on the logical landscape. Those who would like to take a Wignerian slant on the topic could argue that the effectiveness of classical logic attests to the universe's being intertwined with that kind of logic. The multiplicity of logics that have been introduced to deal with applications is evidence that there is no single logic that fits all situations.

The issue is whether there is something ludicrous about considering alternatives to classical logic or whether there may be room for non-classical logics just as there is room for non-Euclidean geometry. A book by Susan Haack devoted to the alternatives to classical logic bears the title *Deviant Logics*, the adjective suggesting more than just non-classicality. [6] The activity of philosophers of mathematics and logic in pursuing these alternatives has not always carried over to the mathematical classroom. Then again there are plenty of educational systems where non-Euclidean geometry is invisible through most of a student's geometrical education. We regard non-Euclidean geometry as interesting and applicable. As philosophy of mathematics encompasses more non-classical logics, they may be equally interesting and applicable in helping us to understand mathematics.[7]

References

- [1] Jeremy Gray, *Ideas of Space* (Oxford University Press, 1979). See also Jeremy Gray, *Worlds Out of Nothing* (Springer, 2007); Marvin Jay Greenberg, *Euclidean and Non-Euclidean Geometries* (W.H. Freeman, 1993); and B.A. Rozenfeld, *The History of Non-Euclidean Geometry* (Springer, 1988).
 - [2] Eugene Wigner, 'The Unreasonable Effectiveness of Mathematics in the Natural Sciences', *Communications in Pure and Applied Mathematics* 13 (1960): 1–14.
 - [3] Michael A.E. Dummett, *Elements of Intuitionism* (Oxford University Press, 1977). See also Dirk van Dalen, *L.E.J. Brouwer* (Springer, 2013).
 - [4] Garrett Birkhoff and John von Neumann, 'The Logic of Quantum Mechanics', *Annals of Mathematics* 37 (1936): 823–843.
 - [5] Stephen Read, *Relevant Logic* (Blackwell, 1988).
 - [6] Susan Haack, *Deviant Logic* (Cambridge University Press, 1974).
 - [7] Greg Restall and J.C. Beall, *Logical Pluralism* (Oxford University Press, 2005).
- Thomas Drucker (druckert@uww.edu) is Past Chair of the Philosophy of Mathematics Special Interest Group of the Mathematical Association of America. He was co-editor of the journal *Modern Logic* and editor of the collection *Perspectives on the History of Mathematical Logic* (Birkhauser). He teaches mathematics and computer science at the University of Wisconsin–Whitewater.*



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Charitable Pooling is a mechanism by which Air Canada passengers can donate some or all of their earned frequent flyer miles to a non-profit organization. The organization can then use those miles to pay airfares for travel that aligns with the organization's mission.

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Chaque année, la SMC utilise les milles Aéroplan qui ont été donnés à son compte d'organisme de charité pour les déplacements de l'équipe de l'OIM et des étudiants des cycles supérieurs et postdoctorants qui assistent à ses Réunions.

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Pour faire don de milles Aéroplan à la SMC, suivez le lien suivant : <https://beyondmiles.aeroplan.com/fra/charity/941>

2017 Adrien Pouliot Award

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.

Nominations must be received by the CMS Office **no later than April 30, 2017**.

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 2017

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.

Les mises en candidature doivent parvenir au bureau de la SMC **avant le 30 avril 2017**.

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.



MCA 2017



1. Representations of Lie Algebras | Représentation des algèbres de Lie
2. Several Complex Variables | Plusieurs variables complexes
3. Computations in Groups and Applications | Le calcul en théorie des groupes et ses applications
4. Interactions Between Model Theory and Analysis and Topology | Interactions entre la théorie des modèles, l'analyse et la topologie
5. Representation Theory of Algebras | Théorie de la représentation des algèbres
6. Finite Algebraic Combinatorics and Applications | Combinatoire algébrique finie et applications
7. Combinatorial Commutative Algebra | Algèbre commutative combinatoire
8. Symbolic Dynamics | Dynamique Symbolique
9. Mathematical Applications in Cryptography | Applications des mathématiques en cryptographie
10. Theory and Applications of Finite Fields | Corps finis: théorie et applications
11. Hopf Algebras and Tensor Categories | Algèbres de Hopf et catégories de tenseurs
12. Motives and Periods | Périodes et motifs
13. Operator Theory on Function Spaces | Théorie des opérateurs sur des espaces de fonctions
14. Soft Packings, Nested Clusters, and Condensed Matter | Packings mous, amas imbriqués et matière condensée
15. Probability Theory | Théorie des probabilités
16. Finite and Infinite Dimensional Hamiltonian Systems | Systèmes hamiltoniens en dimension finie et infinie
17. Applied Math and Computational Science across the Americas | Mathématiques appliquées et modélisation numérique à travers l'Amérique
18. Control of Partial Differential Equations | Contrôle des équations aux dérivées partielles
19. Arithmetic Geometry and Related Topics | Géométrie arithmétique et sujets reliés
20. Groups in Geometry and Topology | Groupes en géométrie et en topologie
21. Harmonic Analysis and Inverse Problems | Analyse harmonique et problèmes inverses
22. Geometric Analysis | Analyse géométrique
23. Applied and Computational Algebra and Geometry | Algèbre et géométrie appliquées et computationnelles
24. Hamiltonian Systems and Celestial Mechanics | Systèmes hamiltoniens et mécanique céleste
25. Morse, Conley, and Forman Approaches to Smooth and Discrete Dynamics | Approches de Morse, Conley et Forman en dynamique smooth et discrète
26. Calabi-Yau Manifolds and Calabi-Yau Algebra | Variétés et algèbre de Calabi-Yau Algebra
27. Computational Inverse Problems: From Multiscale Modeling to Uncertainty Quantification | Problèmes computationnels inverses : de la modélisation multi-échelle à la quantification de l'incertitude
28. Gauge Theory and Special Geometry | Théorie de jauge et géométrie spéciale
29. Symmetry in Algebra, Topology, and Physics | La symétrie en algèbre, en topologie et en physique
30. Von Neumann Algebras and their Applications | Algèbres de Von Neumann et leurs applications
31. Arithmetic Dynamics | Dynamique arithmétique
32. Holomorphic Foliations and Singularities of Mappings and Spaces | Foliations holomorphes et singularités des représentations et des espaces
33. Singularities and Phase Transitions in Condensed Matter | Singularités de la matière condensée et transitions de phases
34. Discrete Groups and Operator Algebras | Groupes discrets et algèbres des opérateurs
35. Recent Trends in Algebraic Cycles, Algebraic K-Theory and Motives | Dernières tendances en cycles algébriques, K-théorie algébrique et motifs
36. Nonlinear Partial Differential Equations | Équations aux dérivées partielles (EDP) non linéaires
37. Nonlocal Variational Problems | Problèmes variationnels non locaux
38. Advances in Analysis, PDE's and Related Applications | Progrès en analyse, EDP et applications connexes
39. Nonlinear Dispersive Equations | Équations dispersives non linéaires
40. Mathematical Physics | Physique mathématique
41. Stringy Geometry | Géométrie des cordes
42. Quantitative Geometry and Topology | Géométrie et topologie quantitatives
43. Fractal Geometry and Dynamical Systems | Géométrie fractale et systèmes dynamiques
44. Optimization and Control | Optimisation et contrôle
45. Extremal and Probabilistic Combinatorics | Extremal and Probabilistic Combinatorics
46. Geometry of Differential Equations, Real and Complex | Géométrie des équations différentielles, réelles et complexes
47. Current Trends in Combinatorics | Tendances actuelles en combinatoire
48. Cohomology of Groups | Cohomologie des groupes
49. Classification of Amenable C^* - algebras | Classification des algèbres C^* moyennables
50. Geometry and Physics of Higgs Bundles | Géométrie et physique des bundles de Higgs
51. Incompressible Fluid Dynamics | Dynamique des fluides incompressibles
52. Nonlinear and Stochastic Partial Differential Equations | Équations aux dérivées partielles non linéaires et stochastiques
53. Models and Methods in Evolutionary Differential Equations on Mixed Scales | Modèles et méthodes en équations différentielles évolutives sur échelles mixtes
54. Interactions Between Geometric Group Theory, Low-Dimensional Topology and Geometry, and Dynamics | Interactions entre la théorie des groupes géométrique, la topologie et la géométrie en basse dimension et la dynamique
55. Equations of Fluid Mechanics: Analysis | Équations de la mécanique des fluides : analyse
56. Equations of Fluid Mechanics: Numerics | Équations de la mécanique des fluides : nombres
57. Geometry and Combinatorics of Cell Complexes | Géométrie et combinatoire des complexes cellulaires
58. Recent Advance in Disease Dynamics Analysis | Progrès récents en analyse de la dynamique des maladies
59. Free Probability and its Applications | Probabilité libre et ses applications
60. Groups and Algebras | Groupes et algèbres
61. Shape, Homotopy, and Attractors | Forme, homotopie et attracteurs
62. Topological Dynamics and Operator Algebras | Dynamique topologique et algèbres d'opérateurs
63. Mathematics of Quantum Phases of Matter and Quantum Information | Mathématiques des phases quantiques de la matière et de l'information quantique
64. Advances in Arrangement Theory | Progrès en théorie des arrangements
65. Number Theory & Analysis | Théorie des nombres et analyse
66. Spectrum and Dynamics | Spectre et dynamique
67. Quantum Walks, Open Quantum Walks, Quantum Computation and Related Topics | Marches quantiques, marches quantiques ouvertes, calcul quantique et sujets connexes
68. Advances in Algebraic and Analytic Number Theory | Avancées en théorie des nombres algébrique et analytique
69. Noncommutative Geometry and Quantization | Géométrie non commutative et quantification
70. Symmetries of Symplectic Manifolds and Related Topics | Symétries des variétés symplectiques et sujets connexes
71. Galois Representations and Automorphic Forms | Représentations de Galois et formes automorphes
72. Geometric Group Theory | Théorie des groupes géométriques



MCA 2017



CMS Executive Meeting

Saturday July 22nd: 4pm - 7pm
Marriott Château Champlain, Terrasse Meeting Room

CMS Executive and Board Information Session

Wednesday July 26th: 1pm - 2:30pm
Centre Mont-Royal - Salon International E

CMS AGM Lunch

Tuesday July 25th: 1pm - 2:30pm
Centre Mont-Royal, Salon International E

Plenary Speakers



Manuel del Pino,
Universidad de Chile



Shafraira Goldwasser,
MIT, USA



Andrew Granville,
Université de Montréal



Peter Ozsvath,
Princeton University



Yuval Peres, Microsoft
Research, USA



Cecilia String Quartet Concert at McGill's Pollack Hall

As part of a wider cultural programme, the conference has booked McGill's Pollack Hall for a performance of the Cecilia Quartet, a prize-winning and up and coming string quartet (<http://ceciliastringquartet.com>).

July 25, 2017 at 8 p.m.

Tickets are \$10.

Hailed for their “powerful” (Chicago Sun-Times) and “dauntingly perfect” (Berliner Zeitung) performances, the CSQ perform for leading presenters in North America and Europe. Past engagements include performances at the Amsterdam Concertgebouw, Berlin Konzerthaus, Northwestern University in Illinois, Buffalo Chamber Music Society, and London’s Wigmore Hall. Their live concert recordings have been broadcast on more than a dozen international public radio networks, including Australia (ABC Classical FM), Canada (CBC/SRC), the United States (WQXR), England (BBC Radio 3), and Germany (DeutschlandRadio). Prize-winners at several international competitions, including Osaka (2008) and Bordeaux (2010), they were awarded First Prize at the 2010 Banff International String Quartet Competition (BISQC), where they also won the prize for the best performance of the commissioned work.



CMA 2017



Réunion du comité exécutif de la SMC

Samedi 22 juillet : 16 h - 19 h

Marriott Château Champlain, Salle de réunion Terrasse

Comité exécutif de la SMC et séance d'information du Conseil

Mercredi 26 juillet : 13 h - 14 h 30

Centre Mont-Royal - Salon International E

Dîner de l'AGA de la SMC

Mardi 25 juillet : 13 h - 14 h 30

Centre Mont-Royal - Salon International E

Conférenciers pléniers



Manuel del Pino,
Université du Chili



Shafrira Goldwasser,
MIT, États-Unis



Andrew Granville,
Université de Montréal



Peter Ozsvath,
Université de Princeton



Yuval Peres, Microsoft
Research, États-Unis

Concert du Cecilia String Quartet à la salle Pollack de l'Université McGill

Dans le cadre d'un programme culturel élargi, les organisateurs ont réservé la salle Pollack de l'Université McGill pour un spectacle du Cecilia Quartet, un quatuor à cordes primé et à la popularité montante (<http://ceciliastringquartet.com>).

Le 25 juillet 2017 : 20 h

Coût du billet : 10 \$

Salué pour ses spectacles « d'une grande puissance » (*Chicago Sun-Times*) et « d'une perfection terrifiante » (*Berliner Zeitung*), ce quatuor se produit avec des sommets en Amérique du Nord et en Europe. Il a notamment joué avec au Concertgebouw d'Amsterdam, Konzerthaus de Berlin, à l'Université Northwestern en Illinois, à la Buffalo Chamber Music Society et au Wigmore Hall à Londres. Leurs enregistrements de concerts en direct ont été diffusés sur plus d'une dizaine de réseaux de radio publics internationaux, notamment en Australie (ABC Classical FM), au Canada (CBC/SRC), aux États-Unis (WQXR), en Angleterre (BBC Radio 3) et en Allemagne (DeutschlandRadio). Lauréat de plusieurs concours internationaux, dont Osaka (2008) et Bordeaux (2010), le quatuor a reçu le premier prix de l'International String Quartet Competition de Banff, où il a également remporté le prix de la meilleure performance de l'œuvre commandée.

Conférences des lauréats de prix de la SMC

Dimanche 23 juillet : 15 h 30 - 16 h 30

Dimanche 23 juillet : 19 h - 20 h

Centre Mont-Royal - Auditorium

Réunions des comités de la SMC

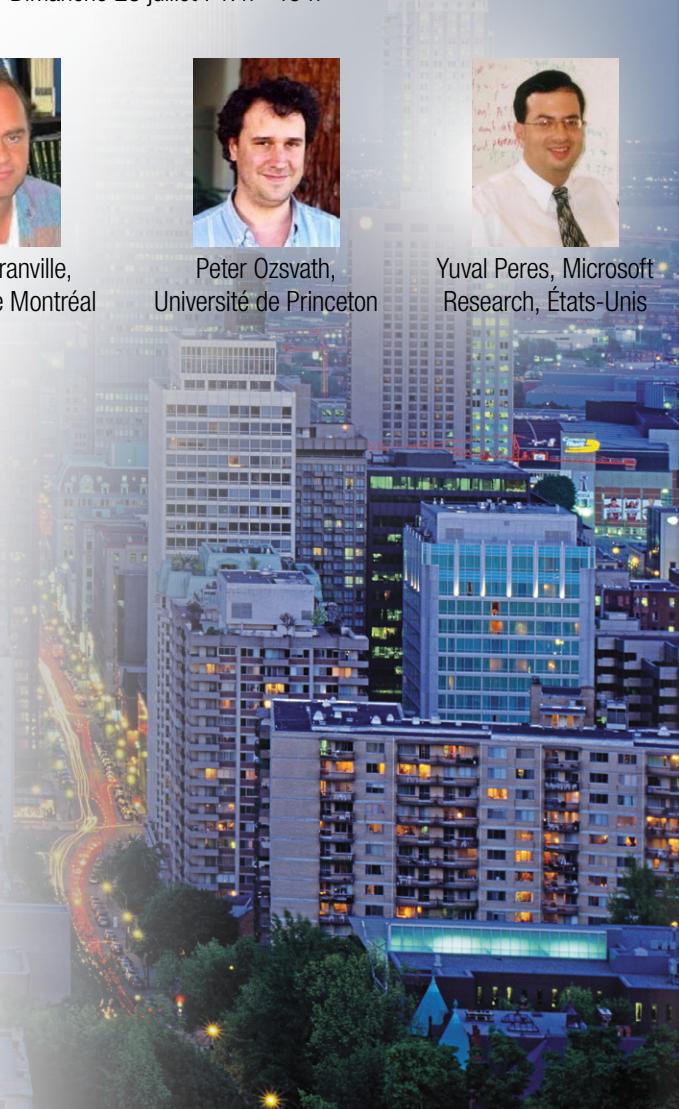
Toutes les réunions de comités peuvent se tenir à l'hôtel Marriott Château Champlain entre le 22 et le 28 juillet, de 7 h à 22 h.

Pour réserver une date pour votre comité, veuillez contacter Sarah Watson (reunions@smc.math.ca).

Une fois la réservation faite, la réunion de votre comité sera publiée sur le site du CMA.

Réception de bienvenue CMA

Dimanche 23 juillet : 17h - 19 h





Call for Sessions

Appel de propositions de séances

WILL YOU BE THERE? | SEREZ-VOUS PRÉSENTS ?
2017 CMS Winter Meeting | Réunion d'hiver de la SMC 2017

2017 CMS Winter Meeting

December 8-11, 2017

University of Waterloo, Waterloo, Ontario

Prizes | Prix

Recipients to be announced | Lauréats à confirmer

2017 Excellence in Teaching Award | Prix d'excellence en enseignement 2017

2017 Adrien Pouliot Award | Prix Adrien-Pouliot 2017

2017 Coxeter-Jame Prize | Prix Coxeter-James 2017

2017 Doctoral Prize | Prix de doctorat 2017

2017 Graham Wright Award for Distinguished Service |
Prix Graham Wright pour service méritoire 2017

2017 G. de B. Robinson Award | Prix G. de B.
Robinson 2017

Scientific Directors | Directeurs scientifiques

Ken Davidson, University of Waterloo, krdavids@uwaterloo.ca
Cam Stewart, University of Waterloo, cstewart@uwaterloo.ca

Réunion d'hiver de la SMC 2017

8-11 décembre 2017

Université de Waterloo, Waterloo, Ontario

Plenary Lectures | Conférences plénierées

Bill Cook, University of Waterloo

Ilijas Farah, York University

Joel Kamnitzer, University of Toronto

Niky Kamran, McGill University

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Public Lecture | Conférence publique

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