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# CMS NOTES de la SMC

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# Some Comments on the State of Research Support in Canada

Cover Article June 2024 (Vol. 56, No. 3)

**David Pike** (Memorial University of Newfoundland)
*Past President*

In this note I would like to discuss the state of research funding offered by NSERC, the Natural Sciences and Engineering Research Council of Canada. NSERC supports scientific activities though several programs including scholarships provided to undergraduate and graduate students, fellowships for post-doctoral fellows, as well as research grants and other programs that target science outreach activities. The amount of funding that NSERC has at its disposal is controlled by the federal government. While various governments have occasionally provided NSERC with new and increased funding, the unfortunate reality is that the funding for grants and scholarships has not kept pace with inflation.

The situation regarding graduate student scholarships has been the focus of media attention in recent months thanks in large part to the grassroots Support Our Science organisation that lobbied for increased support. The argument was an easy one to make, given that CGS-Master's and PGS-Doctoral graduate student scholarships had remained unchanged at $17,500 and $21,000 respectively for over twenty years. Despite being called "scholarships" in name, these awards function in practice as the primary source of income for the students who hold them. While graduate students could potentially live on $17,500 or $21,000 twenty years ago, today this level of funding falls below the poverty line.

I am pleased to report that the federal budget that was tabled in the House of Commons in April promises substantive changes to graduate scholarships. If it is passed without revision, then Master's scholarships will increase from $17,500 to $27,000, and Doctoral PGS awards will increase from $21,000 to $40,000 per year. Post-doctoral fellowships will also increase from $45,000 to $70,000 per year. Moreover, the budget pledges to increase the number of scholarships and fellowships, although specific details in this regard are not currently available. These increases in support for graduate students and post-doctoral fellows are very much appreciated. We can hope they are a sign that the federal government values science and the upcoming generation of researchers.

However, that hope may be overly optimistic, as there are other aspects of federal support that still lag behind. One of these is the support provided in the form of Undergraduate Student Research Awards. These awards are often provided to talented undergraduate students who work on summer research projects under the supervision of a professor. The way that USRA funding works is that NSERC provides $6,000 and the supervising professor is required to provide a supplement of 25% from their research grant. This presents an opportunity for students to gain research experience over the 16 week period of the award. But when you do the math, the combined $7,500 that the student receives translates to $468.75 per week. Assuming a 7.5 hour workday, this becomes $12.50 per hour. This is a substandard level of remuneration (indeed, it falls below the minimum wage in several provinces) and creates a systemic barrier that deters underprivileged students from being able to accept and benefit from the intended training and research opportunities. I contend that the federal government and NSERC can and should do better. Of course, so can professors, by providing more than the minimum supplement of 25%. That is, if the professor has a research grant that is sufficiently flush with cash to do so.

This now brings me to the state of funding of NSERC Discovery Grants, which are the primary (and in many cases the only) source of research funding available to mathematicians at Canadian universities. A strength of the NSERC granting system, and a feature that makes it the envy of mathematicians elsewhere, is that it has practiced a philosophy of providing a broad base of support to researchers across the country. Said another way, almost all mathematics researchers who demonstrate genuine strength in areas of research and student training have traditionally been provided support, even if that support has been relatively modest. In other countries, there is a tendency to concentrate support among a small cohort of exceptionally eminent researchers who are provided with considerably large sums of funding, leaving many capable researchers to cope without support.

Similar to the languish experienced over the past decades by NSERC scholarships, Canada's support for Discovery Grants has also failed to keep pace with inflation. At last Summer's meeting of the CMS Board of Directors, delegates from NSERC presented alarming news from the 2023 NSERC Discovery Grants competition. Specifically, NSERC chose to not provide funding to established researchers whose applications were placed in Bin J (the "Strong Strong Strong" bin, so called because of the corresponding "Strong" score in each of three evaluation criteria). This decision was applied across all disciplines without prior consultation with the scientific community. The underlying motivation appeared to be a desire to increase the individual value of those grants that were awarded, but in the absence of an overall increase in funding from the government, NSERC chose to achieve this effect by raising the threshold for researchers to obtain grants.

The impact that this change will have on researchers whose NSERC applications fall into Bin J is devastating. Even though Bin J had previously offered only modest support, it enabled researchers to remain active, to travel to a conference, and to support USRA students. Denying support for meritorious researchers has the real potential to end their research careers, and further it will disrupt the talent pipeline that nurtures students who would normally be mentored by the affected researchers.

The CMS Board voiced objections to the NSERC representatives who broke the news to us at our summer meeting in Ottawa. This was subsequently followed up with letters sent directly to Marc Fortin, NSERC's Vice-President for Research Grants and Scholarships, to further protest and express concerns about NSERC's decision. In November, Dr. Fortin met with the society's Board of Directors, who reinforced how NSERC's decision harms both those directly affected as well as the wider mathematical family. I am aware that several other societies that represent other science disciplines were also taken by surprise, and that they too have responded to express their shock and concern. While our collective dissatisfaction has been acknowledged, it remains to be seen what effect our protests will have.

It is disheartening to hear that the 2024 Discovery Grants competition (for which results have only recently been communicated to applicants) appears to have again left researchers within Bin J without research grants. There may be a glimmer of hope in the 2024 federal budget though. In addition to the long overdue and substantial increase in support for graduate student scholarships and post-doctoral fellowships, the budget proposes to "increase core research grant funding and support for Canadian researchers," which would seem to suggest that it may provide an injection of new funding towards NSERC Discovery Grants. How NSERC will actually distribute whatever new funding it will soon receive from the government is not yet known. We will be watching with great interest to see what happens.

In the meantime, one thing that I have learned from the many conversations and meetings that I have had on these matters is that there is a profound need for our politicians to value science and the benefits of adequately supporting a broad base of research activities. Should you have the opportunity to discuss the state of research investment with your elected representatives, please take a moment to do so and to educate them about the many values of science and research.

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# Quelques commentaires sur l'état du soutien à la recherche au Canada

Article de couverture

Juin 2024 (tome 56, no. 3)

**David Pike** (Memorial University of Newfoundland)
*Past President*

Dans cette note, j'aimerais discuter de l'état du financement de la recherche offert par le CRSNG, le Conseil de recherches en sciences naturelles et en génie du Canada. Le CRSNG soutient les activités scientifiques par le biais de plusieurs programmes, notamment des bourses d'études pour les étudiants de premier et deuxième cycles, des bourses de recherche pour les post-doctorants, ainsi que des subventions de recherche et d'autres programmes axés sur les activités de vulgarisation scientifique. Le montant du financement dont dispose le CRSNG est contrôlé par le gouvernement fédéral. Bien que les différents gouvernements aient occasionnellement accordé au CRSNG des fonds nouveaux et accrus, la triste réalité est que le financement des subventions et des bourses n'a pas suivi le rythme de l'inflation.

La situation des bourses d'études supérieures a fait l'objet de l'attention des médias au cours des derniers mois, en grande partie grâce à l'organisation populaire Support Our Science, qui a fait pression pour obtenir un soutien accru. L'argument était facile à faire valoir, étant donné que les bourses d'études supérieures CGS-Maîtrise et PGS-Doctorat sont restées inchangées à 17 500 $ et 21 000 $ respectivement depuis plus de vingt ans. Bien qu'elles portent le nom de « bourses », ces bourses constituent dans la pratique la principale source de revenus des étudiants qui les détiennent. Alors que les étudiants diplômés pouvaient potentiellement vivre avec 17 500 $ ou 21 000 $ il y a vingt ans, ce niveau de financement se situe aujourd'hui en dessous du seuil de pauvreté.

J'ai le plaisir d'annoncer que le budget fédéral qui a été présenté à la Chambre des communes en avril promet des changements substantiels pour les bourses d'études supérieures. S'il est adopté sans révision, les bourses de maîtrise passeront de 17 500 $ à 27 000 $, et les bourses de doctorat passeront de 21 000 $ à 40 000 $. Les bourses post-doctorales passeront également de 45 000 $ à 70 000 $ par an. En outre, le budget s'engage à augmenter le nombre de bourses d'études et de perfectionnement, bien que les détails spécifiques à cet égard ne soient pas encore disponibles. Ces augmentations du soutien aux étudiants diplômés et aux boursiers post-doctoraux sont très appréciées. Nous pouvons espérer qu'elles sont le signe que le gouvernement fédéral accorde de l'importance à la science et à la nouvelle génération de chercheurs.

Toutefois, cet espoir est peut-être trop optimiste, car d'autres aspects de l'aide fédérale sont encore à la traîne. L'un d'entre eux est le soutien apporté sous la forme de bourses de recherche pour les étudiants de premier cycle. Ces bourses sont souvent attribuées à des étudiants de premier cycle talentueux qui travaillent sur des projets de recherche d'été sous la supervision d'un professeur. Le financement des BRPC se fait de la manière suivante : le CRSNG fournit 6 000 $ et le professeur superviseur doit fournir un supplément de 25 % de sa subvention de recherche. Les étudiants ont ainsi l'occasion d'acquérir une expérience de la recherche au cours des 16 semaines que dure la bourse. Mais si l'on fait le calcul, les 7 500 $ que reçoit l'étudiant se traduisent par 468,75 $ par semaine. En supposant une journée de travail de 7,5 heures, cela représente 12,50 $ par heure. Il s'agit d'un niveau de rémunération inférieur aux normes (en effet, il est inférieur au salaire minimum dans plusieurs provinces) et crée un obstacle systémique qui dissuade les étudiants défavorisés d'accepter les opportunités de formation et de recherche prévues et d'en bénéficier. Je soutiens que le gouvernement fédéral et le CRSNG peuvent et doivent faire mieux. Bien sûr, les professeurs peuvent faire de même, en offrant plus que le supplément minimum de 25 %. Ceci, à condition que le professeur dispose d'une subvention de recherche suffisamment élevée pour le faire.

Cela m'amène à parler de l'état du financement des subventions à la découverte du CRSNG, qui constituent la principale (et dans de nombreux cas la seule) source de financement de la recherche pour les mathématiciens dans les universités canadiennes. L'un des points forts du système de subventions du CRSNG, qui fait l'envie des mathématiciens d'ailleurs, est qu'il a adopté une philosophie consistant à fournir une large base de soutien aux chercheurs de tout le pays. En d'autres termes, presque tous les chercheurs en mathématiques qui font preuve d'une véritable force dans les domaines de la recherche et de la formation des étudiants ont traditionnellement bénéficié d'un soutien, même si ce soutien était relativement modeste. Dans d'autres pays, on observe une tendance à concentrer le soutien sur une petite cohorte de chercheurs exceptionnellement éminents qui reçoivent des sommes considérables, ce qui leur permet de se concentrer sur la recherche et la formation des étudiants.

À l'instar des bourses du CRSNG qui languissent depuis plusieurs décennies, le soutien du Canada aux subventions à la découverte n'a pas non plus suivi le rythme de l'inflation. Lors de la réunion du Conseil d'administration de la SMC de l'été dernier, les délégués du CRSNG ont présenté des nouvelles alarmantes concernant le concours de subventions à la découverte du CRSNG pour 2023. Plus précisément, le CRSNG a choisi de ne pas accorder de financement aux chercheurs établis dont les demandes ont été placées dans le bac J (le bac « fort fort fort », ainsi appelé en raison de la note « fort » correspondante dans chacun des trois critères d'évaluation). Cette décision a été appliquée à toutes les disciplines sans consultation préalable de la communauté scientifique. La motivation sous-jacente semble être le désir d'augmenter la valeur individuelle des subventions accordées, mais en l'absence d'une augmentation globale du financement par le gouvernement, le CRSNG a choisi d'obtenir cet effet en élevant le seuil d'obtention des subventions pour les chercheurs.

L'impact de ce changement sur les chercheurs dont les demandes auprès du CRSNG tombent dans le bac J est dévastateur. Même si le bac J n'offrait auparavant qu'un soutien modeste, elle permettait aux chercheurs de rester actifs, de se rendre à une conférence et de soutenir des étudiants de l'USRA. Refuser de soutenir des chercheurs méritants risque réellement de mettre fin à leur carrière de chercheur et, en outre, de perturber le vivier de talents qui nourrit les étudiants qui seraient normalement encadrés par les chercheurs concernés.

Le Conseil d'administration de la SMC a fait part de ses objections aux représentants du CRSNG qui nous ont annoncé la nouvelle lors de notre réunion d'été à Ottawa. Il a ensuite envoyé des lettres directement à Marc Fortin, vice-président du CRSNG chargé des subventions de recherche et des bourses, afin de protester contre la décision du CRSNG et d'exprimer ses préoccupations à cet égard. En novembre, le Dr Fortin a rencontré le conseil d'administration de la société, qui a insisté sur le fait que la décision du CRSNG nuit à la fois aux personnes directement touchées et à l'ensemble de la famille mathématique. Je sais que plusieurs autres sociétés représentant d'autres disciplines scientifiques ont également été prises par surprise et qu'elles ont elles aussi réagi pour exprimer leur choc et leur inquiétude. Bien que notre mécontentement collectif ait été reconnu, il reste à voir quel sera l'effet de nos protestations.

Il est décourageant d'apprendre que le concours de subventions à la découverte 2024 (dont les résultats n'ont été communiqués que récemment aux candidats) semble avoir une fois de plus laissé les chercheurs au sein du bac J sans subventions de recherche. Une lueur d'espoir pourrait toutefois apparaître dans le budget fédéral 2024. Outre l'augmentation substantielle et attendue depuis longtemps du soutien aux bourses d'études supérieures et aux bourses postdoctorales, le budget propose d'« accroître le financement des subventions de recherche de base et le soutien aux chercheurs canadiens », ce qui semble indiquer qu'il pourrait fournir une injection de nouveaux fonds vers les subventions à la découverte du CRSNG. On ne sait pas encore comment le CRSNG distribuera les nouveaux fonds qu'il recevra bientôt du gouvernement. Nous suivrons avec grand intérêt ce qui se passera.

Entre-temps, les nombreuses conversations et réunions que j'ai eues sur ces questions m'ont appris que nos hommes politiques doivent absolument valoriser la science et les avantages d'un soutien adéquat à une large base d'activités de recherche. Si vous avez l'occasion de discuter de l'état des investissements dans la recherche avec vos représentants élus, prenez le temps de le faire et de les informer des nombreuses valeurs de la science et de la recherche.

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# To See the World in a Grain of Sand

Editorial June 2024 (Vol. 56, No. 3)

**Robert Dawson** (Saint Mary's University)
*Editor, CMS Notes*

Recently I, and some European colleagues, have been spending a lot of time on tetrahedra, and when they fall over.

You might think that there wouldn't be much to say about a tetrahedron. Four vertices, shrinkwrapped. Twelve real numbers specify the whole thing, including its position. If you're not concerned with position or size, five parameters suffice. But… it's amazing the number of rabbit-holes that that five-dimensional moduli space contains, and we're exploring just one of them. I won't say it's the most earth-shattering material any of us has worked on: it isn't. But we're still surprising ourselves with what we find.

Mathematics is notoriously full of questions that are easy to ask and hard to answer. Why that should be is in itself a deep question. Partly, it's because a proper answer to a well-defined mathematical question is just as hard-edged as the question was, so that we can keep following arbitrarily long chains of arguments. Other subjects – based on reality – don't always work that way. At some point not only does the biologist have to deal with the presence of the platypus, but also the absence of many perfectly plausible species, such as the unicorn and the Ogopogo, that would allow interesting conjectures to be tested if they only had the decency to exist. This means that the discoveries of biology are, in general, more important to the taxpayer, – no NSERC grant used up on the case of the spherical massless horse – but perhaps means that the articles in *Nature* resemble each other more strongly than the articles in the *American Mathematical Monthly*. We can build weird baroque temples to the imagination without worrying whether they will bear their own weight, precisely because they weigh nothing. Provided the individual joints are rigid, the structure stands.

Is this playing the game on the easy setting? Possibly, but it's a different game. Other sciences can treat a statistical argument based on a sample size of a thousand as effectively conclusive; we treat a conjecture that holds in the first trillion cases as "plausible," knowing that the rigor that lets us keep chaining deductions forever hasn't been satisfied. (And any graduate student should be able to cite a few examples of nontrivial conjectures that *do* hold for the first trillion, or ten-to-the-trillion, cases and then fail.)

And, as a result, we can find interesting problems in the stability of a tetrahedron, the sum of a pair of prime numbers, or any of a million other sources.

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NOTES de la SMC

# Voir le monde dans un grain de sable

Éditorial Juin 2024 (tome 56, no. 3)

**Robert Dawson** (Saint Mary's University)
*Editor, CMS Notes*

Récemment, avec quelques collègues européens, j'ai passé beaucoup de temps à étudier les tétraèdres et à déterminer quand ils tombent.

On pourrait penser qu'il n'y a pas grand-chose à dire sur un tétraèdre. Quatre sommets, enveloppés d'une pellicule rétractable. Douze nombres réels spécifient l'ensemble, y compris sa position. Si vous n'êtes pas préoccupé par la position ou la taille, cinq paramètres suffisent. Mais… c'est incroyable le nombre de cavités que contient cet espace modulaire à cinq dimensions, et nous n'en explorons qu'une seule. Je ne dirai pas qu'il s'agit du matériau le plus révolutionnaire sur lequel aucun d'entre nous n'a travaillé : ce n'est pas le cas. Mais nous sommes toujours surpris par ce que nous trouvons.

Les mathématiques sont notoirement pleines de questions faciles à poser et difficiles à résoudre. La raison pour laquelle il en est ainsi est en soi une question profonde. C'est en partie parce qu'une réponse appropriée à une question mathématique bien définie est tout aussi difficile que la question elle-même, de sorte que nous pouvons continuer à suivre des chaînes d'arguments arbitrairement longues. D'autres sujets – basés sur la réalité – ne fonctionnent pas toujours de cette manière. À un moment donné, le biologiste doit non seulement faire face à la présence de l'ornithorynque, mais aussi à l'absence de nombreuses espèces parfaitement plausibles, telles que la licorne et l'ogopogo, qui permettraient de tester des conjectures intéressantes si elles avaient la décence d'exister. Cela signifie que les découvertes de la biologie sont, en général, plus importantes pour le contribuable – aucune subvention du CRSNG n'a été utilisée pour le cas du cheval sphérique sans masse – mais cela signifie peut-être que les articles de Nature se ressemblent plus que les articles de l'*American Mathematical Monthly*. Nous pouvons construire d'étranges temples baroques à l'imagination sans nous soucier de savoir s'ils supporteront leur propre poids, précisément parce qu'ils ne pèsent rien. Si les différentes articulations sont rigides, la structure tient debout.

S'agit-il d'un jeu en mode facile ? Peut-être, mais c'est un autre jeu. D'autres sciences peuvent considérer un argument statistique basé sur un échantillon d'un millier de personnes comme effectivement concluant ; nous traitons une conjecture qui se vérifie dans le premier trillion de cas comme « plausible », sachant que la rigueur qui nous permet de continuer à enchaîner les déductions à l'infini n'a pas été satisfaite. (Et n'importe quel étudiant diplômé devrait pouvoir citer quelques exemples de conjectures non triviales qui se vérifient dans les premiers billions, ou dix fois plus, de cas, puis échouent).

En conséquence, nous pouvons trouver des problèmes intéressants dans la stabilité d'un tétraèdre, la somme d'une paire de nombres premiers, ou toute autre source parmi un million d'autres.

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# New Brunswick Mathematics Competition

Education Notes June 2024 (Vol. 56, No. 3)

**John Grant McLoughlin** (University of New Brunswick)

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

**John Grant McLoughlin,** *University of New Brunswick (johngm@unb.ca)*
**Kseniya Garaschuk,** *University of the Fraser Valley (kseniya.garaschuk@ufv.ca)*

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*Le Département de mathématiques et de statistique de l'Université du Nouveau-Brunswick, ainsi que la Faculté des sciences de l'Université de Moncton, invitent les élèves de 7e, 8e et 9e années de la province du Nouveau-Brunswick à participer au trente-neuvième (39e) concours annuel de mathématiques qui aura lieu le vendredi 10 mai 2024.*

*It should be noted that the Competition will be written on the same day and at the same time on the campuses of l'Université de Moncton at Moncton, Edmundston and Shippagan and on both the Fredericton and Saint John campuses of the University of New Brunswick.*

*Le concours sera disponible en anglais et en français sur les cinq campus. Néanmoins, toutes les activités autres que le concours lui-même se dérouleront:*

*· en anglais à **Fredericton** et **Saint John**;*

*· en français à **Shippagan** et à **Edmundston**;*

*· et dans les deux langues à **Moncton**.*

*Des gagnants provinciaux seront identifiés en comparant les résultats obtenus aux cinq lieux de compétition.*

The above information represents a blend of the content from the UNB and l'Université de Moncton websites pertaining to the recent New Brunswick Mathematics Competition/Concours de Mathématiques du Nouveau-Brunswick. A total of 858 students participated in the event held over five campuses with 312, 320 and 226 in Grades 7, 8 and 9 respectively. Each of the locations hosts the contest in the morning followed by lunch and various afternoon activities preceding a closing ceremony with the award presentations. My experience with the local activities is at the Fredericton campus of UNB. Some observations and comments concerning the day in Fredericton follow.

*Teachers' Reception*

Typically hosting this event is my primary involvement on the day of the contest. A room is offered for teachers (and chaperones) to gather while the students are writing the contests. The teachers come from a variety of schools as middle schools in the province include Grades 7 and 8, whereas, secondary schools include Grade 9. Some teachers from smaller communities may teach in Grades K-8, 6-12, or even K-12 schools. The reception offers a chance to enjoy some social time with colleagues including those who may teach in other parts of the province. A few puzzles are made available. However, the focal point quickly becomes the contest papers that are made available to them about five minutes into the official start times of the competition. Teachers can freely collect any of the six papers (three each in French or English).

Participating schools at the Fredericton campus extend to the Miramichi area in the north and to McAdam in the south with much of the river valley from around Perth-Andover area through to Cambridge Narrows. Some students have travelled in excess of two hours before arriving on campus, and select schools may have students arrive the evening before while staying in residence.

Each of grades 7, 8, and 9 have separate grade specific contests that require teachers to drop off and gather students in separate locations usually in different buildings in Fredericton. Hence, many teachers arrive to the reception in advance of the writing time though must leave a bit prior to the completion time. The contest is one hour in duration with 26 multiple choice questions (10 Part A, 10 Part B, and 6 Part C). The questions are worth 3, 4 and 5 points in the respective parts making a possible score of 100. A penalty of one-quarter of the value of a question is applied to incorrect answers. Some overlap will appear with select questions. For instance, the following 2023 question appeared as #13 in Grade 9, #15 in Grade 8 and #18 in Grade 7.

*Which of these numbers is the average (mean) of the other four numbers listed as choices?*

(A) 13 (B) 19 (C) 20 (D) 21 (E) 22

*Lequel des nombres ci-dessous est la moyenne des quatre autres nombres présents dans la liste*

*des choix de réponse?*

(A) 13 (B) 19 (C) 20 (D) 21 (E) 22

The reception offers a valuable connection with teachers with the continuity being welcomed. The 2023 gathering was appreciated in a special way by all after the hiatus from the contest in the preceding years. Ryan Jones of Education and Early Childhood Development was on hand to co-facilitate the reception the past couple of years.

*Afternoon Activities*

The campuses host afternoon activities that engage the students. The Fredericton campus offers a range of presentations and sessions spanning a couple of hours. Participating students sign up for these and attend two or three of them depending upon the timing and lengths. Most of the volunteers are faculty members from different fields including earth sciences, physics, mathematics, business and chemistry. Departments ranging from Classics to English have been involved.

Feedback from the students is overwhelmingly favourable as they enjoy seeing people share some of their passion around teaching and demonstrating ideas from respective areas. Many of the local students would have been on the campus before for some sort of community activity. However, many students are setting foot on a university campus for the first time. The whole experience of the day is enriching from writing a contest in one building to going to a lecture in another and then a lab somewhere else after eating lunch in a large dining hall, and so on. It is a big deal for many to have found themselves in a class on campus. Likewise, it is valuable for the faculty members to interact with young students who enjoy mathematics.

*Awards Ceremony*

The day closes with a ceremony acknowledging contributions and sponsors of the event including the CMS and AARMS. The coordination of the results across the five locations is required in advance to provide provincial winners with recognition at the sites they have written. In addition, awards are offered on a local basis for those who write at a particular campus. These extend to school districts. For example, the top student from a particular school district at the Fredericton location would receive a prize. For perspective, the province has only seven such districts and they would not all be represented at a site.

*The Contest Papers*

University of New Brunswick and l'Université de Moncton share the responsibility of putting the papers together each year. One of the universities on a rotational basis (every year or couple of years) will take the lead in compiling the papers with the other offering feedback. The final paper is then translated and reviewed. My role has varied considerably from being a contributor of a few problems some years to being the lead (co-)writer of the draft contest or at times such as this year not even seeing the problems until the teachers' reception.

Copies of the contest papers in English and French as far back as 1990 appear at the following site: https://www.umoncton.ca/umcm-sciences-mathstat/node/27 .

*Closing Comments on Outreach and Related Activities*

Mathematical outreach is a valuable part of our societal contribution as mathematicians. Too frequently this is hidden from the public beneath that ivory tower cloak or something that mystifies the public. The perception that "You are off now until September" can be offset by heightening awareness of mathematics in our communities. Many of the teachers present on campus thanked faculty for organizing the event. Efforts are appreciated. On that note, Caroline Purdy, Justine Gauthier, Mahin Salmani, and Guohua Yan are among the many people in Fredericton who made the recent day a success. Cindy Thomas had previously done so much of the groundwork prior to the Covid pause and a subsequent shift within the university.

The Faculty of Science at University of New Brunswick has recently recognized outreach more formally with a newly created Outreach Coordinator position. Justine Gauthier will be in this role that encompasses the NB Mathematics Competition among many other endeavours. This link includes more information and details including some past competitions:

https://www.unb.ca/saintjohn/sase/dept/math/math-competition.html

The idea of bringing students and teachers to campuses represents a valuable offering. In terms of mathematics across a province, I would be remiss to not mention the longstanding efforts in British Columbia where many college and university campuses host the BC Junior and Senior contests are held at numerous locations with multiple choice and long answer components each worth 50 out of the 100 possible points. As a faculty member at then named Okanagan University College in the 1990's and subsequently as an adjunct at Thompson Rivers University, I had the opportunity to participate in both Kelowna and Kamloops. For years I was involved in the writing of the contest questions. Unlike the NB setup, there is a preliminary multiple choice contest written about a month prior in schools to select students who will go to the regional sites. More details (including past papers) on the BC Secondary School Mathematics Contest can be found here: https://mathcontest.trubox.ca/

*Education Notes* offers a forum for sharing outreach initiatives or other related ideas of interest to the mathematical community. Readers are encouraged to submit written contributions or simply send along a note. The editors would be pleased to discuss possibilities for publication. Any questions or requests for further information concerning the content of this article are welcomed via email (johngm@unb.ca).

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CSHPM Notes June 2024 (Vol. 56, No. 3)

**Michael Molinsky** (University of Maine at Farmington)

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*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 the column's editor:*

**Amy Ackerberg-Hastings**, *independent scholar (aackerbe@verizon.net)*

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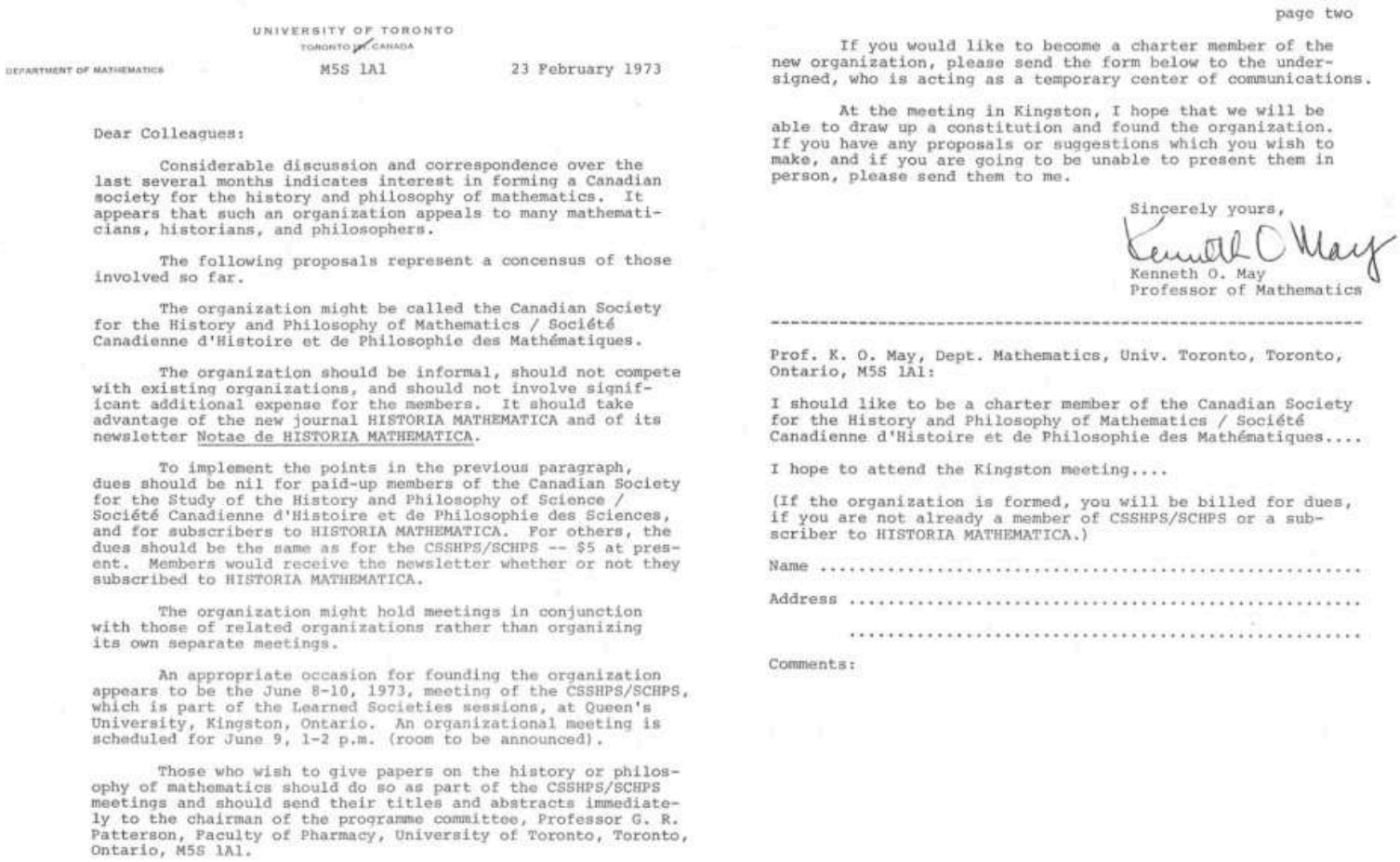
The Canadian Society for History and Philosophy of Mathematics (La Société Canadienne d'Histoire et de Philosophie des Mathématiques) is observing its fiftieth anniversary in 2024. As part of that celebration, this column presents a brief history of the society and its many accomplishments.

The initial push for the creation of the society came from Kenneth O. May (1915–1977) at the Institute for History and Philosophy of Science and Technology at the University of Toronto. Although he made his own research contributions to the study of the history of mathematics, perhaps his greatest legacy was his extensive organization and promotion of the subject, including founding the history of mathematics journal *Historia Mathematica*. In 1972, May surveyed his peers' interest in the creation of a society dedicated to both history and philosophy of mathematics; the enthusiastic response led to an organizational meeting at the Conference of Learned Societies held the following year at Queen's University in Kingston, Ontario.



UNIVERSITY OF TORONTO
TORONTO 181 CANADA

DEPARTMENT OF MATHEMATICS M5S 1A1 23 February 1973

Dear Colleagues:

Considerable discussion and correspondence over the last several months indicates interest in forming a Canadian society for the history and philosophy of mathematics. It appears that such an organization appeals to many mathematicians, historians, and philosophers.

The following proposals represent a concensus of those involved so far.

The organization might be called the Canadian Society for the History and Philosophy of Mathematics / Société Canadienne d'Histoire et de Philosophie des Mathématiques.

The organization should be informal, should not compete with existing organizations, and should not involve significant additional expense for the members. It should take advantage of the new journal HISTORIA MATHEMATICA and of its newsletter Notae de HISTORIA MATHEMATICA.

To implement the points in the previous paragraph, dues should be nil for paid-up members of the Canadian Society for the Study of the History and Philosophy of Science / Société Canadienne d'Histoire et de Philosophie des Sciences, and for subscribers to HISTORIA MATHEMATICA. For others, the dues should be the same as for the CSSHPS/SCHPS -- $5 at present. Members would receive the newsletter whether or not they subscribed to HISTORIA MATHEMATICA.

The organization might hold meetings in conjunction with those of related organizations rather than organizing its own separate meetings.

An appropriate occasion for founding the organization appears to be the June 8-10, 1973, meeting of the CSSHPS/SCHPS, which is part of the Learned Societies sessions, at Queen's University, Kingston, Ontario. An organizational meeting is scheduled for June 9, 1-2 p.m. (room to be announced).

Those who wish to give papers on the history or philosophy of mathematics should do so as part of the CSSHPS/SCHPS meetings and should send their titles and abstracts immediately to the chairman of the programme committee, Professor G. R. Patterson, Faculty of Pharmacy, University of Toronto, Toronto, Ontario, M5S 1A1.

page two

If you would like to become a charter member of the new organization, please send the form below to the undersigned, who is acting as a temporary center of communications.

At the meeting in Kingston, I hope that we will be able to draw up a constitution and found the organization. If you have any proposals or suggestions which you wish to make, and if you are going to be unable to present them in person, please send them to me.

Sincerely yours,

Kenneth O. May

Kenneth O. May
Professor of Mathematics

---

Prof. K. O. May, Dept. Mathematics, Univ. Toronto, Toronto, Ontario, M5S 1A1:

I should like to be a charter member of the Canadian Society for the History and Philosophy of Mathematics / Société Canadienne d'Histoire et de Philosophie des Mathématiques....

I hope to attend the Kingston meeting....

(If the organization is formed, you will be billed for dues, if you are not already a member of CSSHPS/SCHPS or a subscriber to HISTORIA MATHEMATICA.)

Name .....

Address .....

.....

Comments:

**Figure 1.** Kenneth O. May (1915–1977) from the obituary by Joseph W. Dauben and Laura Roebuck for *Historia Mathematica*; a 23 February 1973 letter by May scheduling the organizational meeting described above.

Charles V. Jones of York University chaired the 1973 organizational meeting in May's absence, and the meeting participants agreed to move forward with the creation of the society. Jones made the arrangements to hold the first official meeting at the next Learned Societies conference, hosted by the University of Toronto in 1974. This initial meeting included a contributed papers session, a joint session with the Canadian Society for the History and Philosophy of Science (CSHPS), and a business meeting to officially approve the new society's by-laws, which had been written by Jones, together with Tom Settle of the University of Guelph. *Historia Mathematica* was named the official journal of the society (the first published issue came out only a few months earlier in the year). The first elected officers included Jones as President, Settle as Vice President, and J. Lennart Berggren of Simon Fraser University as Secretary-Treasurer.

The CSHPM membership expanded fairly quickly after the first June 1974 meeting, with 27 paid members by August and 60 paid members by October, including 11 members in the United States. The following year the membership more than doubled, increasing to 144 members by October 1975, including 103 members from Canada, another block of members from over a third of the states in the United States, and also members from Australia, Columbia, France, Germany, Israel, South Korea and Venezuela. This international appeal of the society has continued through the years; for example, while the majority of the society's members have continued to come from Canada and the United States, in 2002 alone the society had members from Argentina, Australia, Austria, Bangladesh, Belgium, Brazil, China, Costa Rica, Denmark, France, Germany, Iceland, Israel, Italy, Japan, Malta, Mexico, Portugal, Spain, Sweden, Taiwan, the United Kingdom, and Zimbabwe. While the membership had some early dips, overall it continued to grow, reaching a high point of 209 members in 2004. In more recent years, the society has averaged a little over 150 members per year.

**Figure 2.** Most of CSHPM's presidents (left to right, top to bottom): Len Berggren, Gilbert de B. Robinson, Ed Barbeau, Craig Fraser, Tom Archibald, Robert Thomas, Jim Tattersall, Glen Van Brummelen, Robert Bradley, Alexander Jones, Duncan Melville, Jean-Pierre Marquis, Elaine Landry, Dirk Schlimm, Maria Zack, and Nic Fillion.

Unfortunately, May's life was cut short in 1977, and so he did not get a chance to see the growth and development of the society he had helped to initiate. Soon after his death, a fund was created in his name to help support the expenses of keynote speakers at CSHPM meetings. In 2002, the annual CSHPM keynote address was formally renamed the Kenneth O. May Lecture in his honor. A collection of twelve of these lectures were published by Springer in 2005 as *Mathematics and the Historian's Craft: The Kenneth O. May Lectures*, edited by Glen Van Brummelen and Michael Kinyon, as part of the CMS Books in Mathematics series.

The story of the selection of the CSHPM logo by Charles Jones in 1976 has already been told in a previous *CSHPM Notes* column (see "Bonaventura Cavalieri and the CSHPM Logo" in *CMS Notes*, pp. 18–19, February 2017). While unquestionably drawn from a pivotal historical work, CSHPM members have not always been enthusiastic about the selected image. In particular, in 2001–2002 the Executive Council surveyed the membership about the logo and asked for possible alternatives; however, while several options were briefly considered, the original image drawn from Cavalieri's *Geometrica Indivisibilibus Continuorum* was left unchanged.

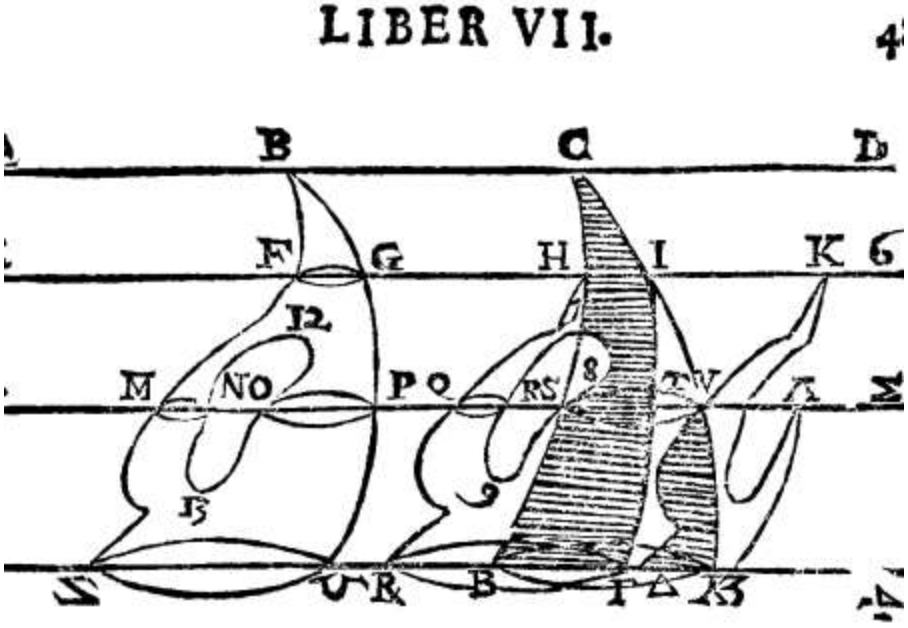



**Figure 3.** The CSHPM/SCHPM Logo.

After several years of more informal newsletters, the *Bulletin of the CSHPM/SCHPM* was first issued in November 1986. Except for brief interruptions, the *Bulletin* has been published regularly twice a year, offering announcements of upcoming conferences and other events, book and website reviews, articles highlighting the achievements and publications of society members, obituaries, classroom ideas, historical problems, and quotations, as well as official minutes of the society's annual meetings. Even an occasional song or poem has graced the pages of the *Bulletin*.

While *Historia Mathematica* was the official journal of the society from the very beginning, in 1993 the society also grew connections to *Philosophia Mathematica* when that journal started its third series. The new editor of the journal, Robert Thomas, was a member of the CSHPM and arrangements were made to provide subscriptions to CSHPM members at a reduced price. This association with what was then the only journal in the world devoted specifically to the philosophy of mathematics was a great new benefit for the society. Additional benefits, in the form of reciprocal memberships with the CSHPS and the British Society for the History of Mathematics (BSHM), were added in 1997.

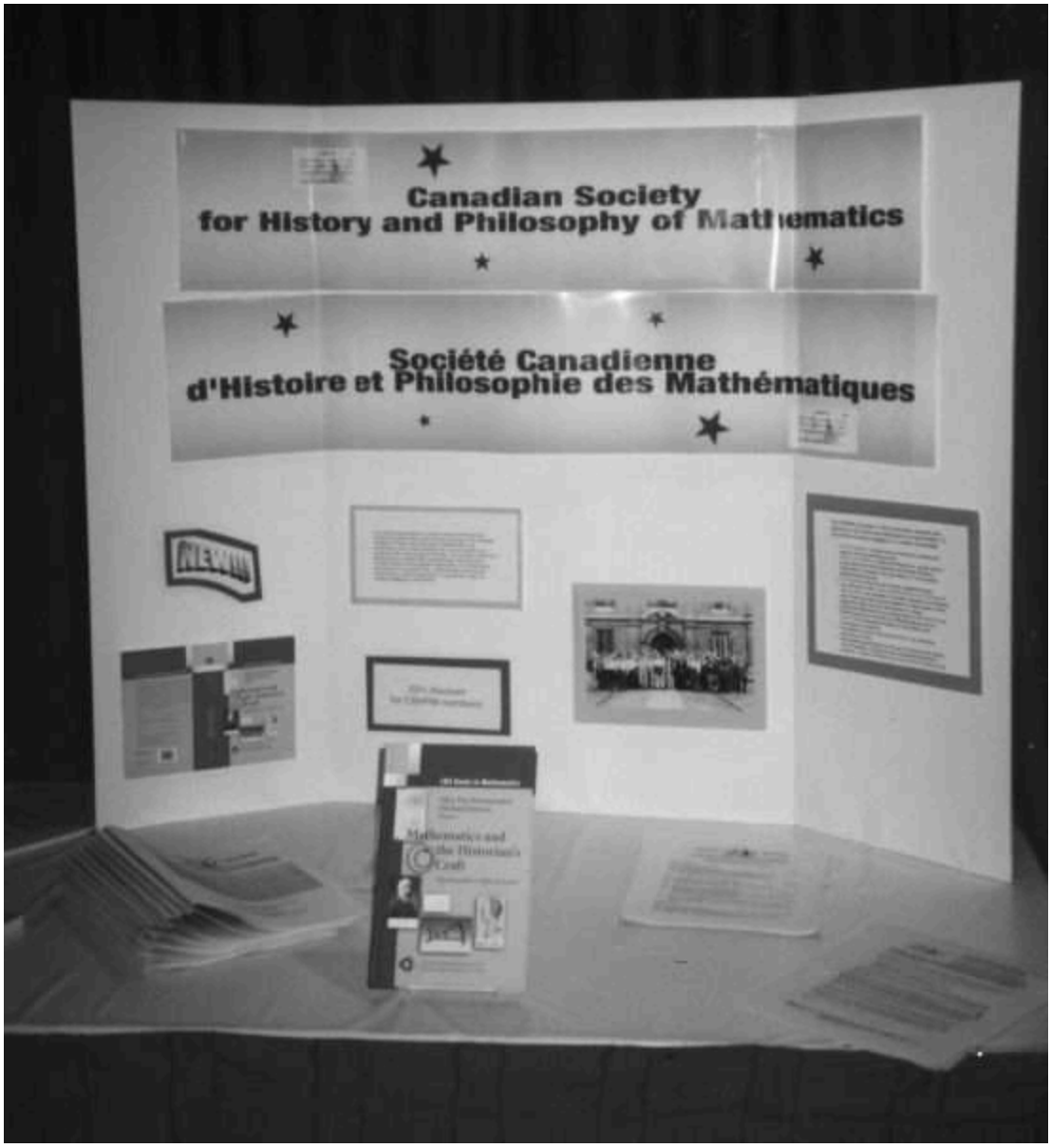
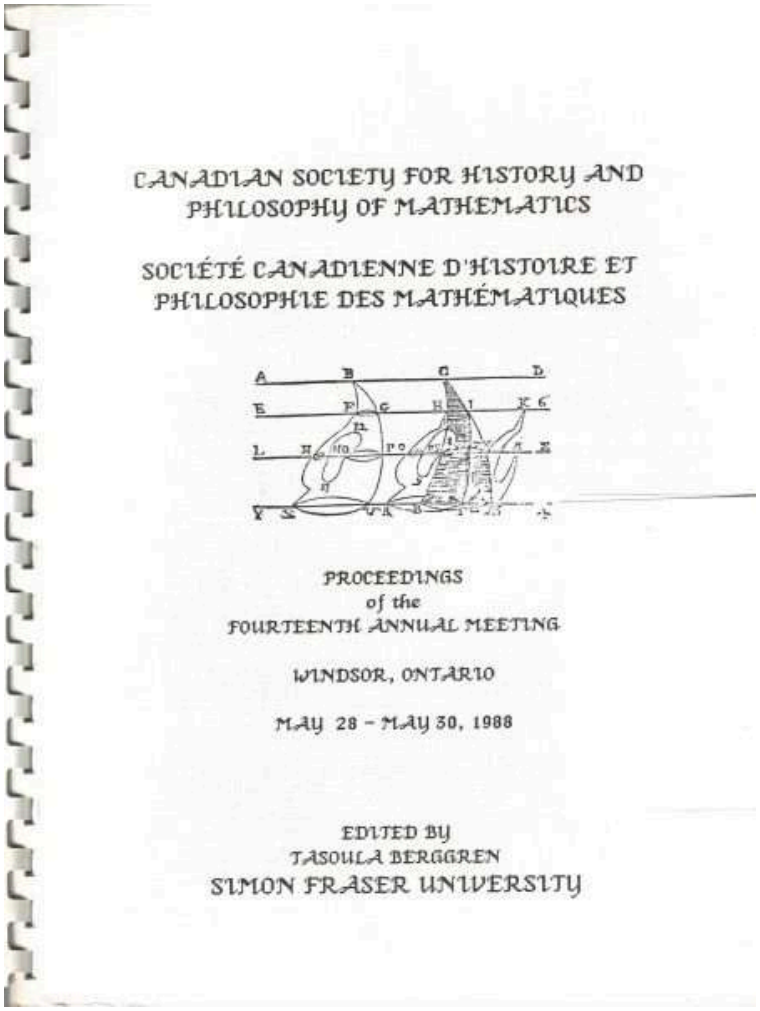



**Figure 4.** CSHPM display from its 2005 joint meeting with CMS.
Photo by Tom Drucker.

Since its founding in 1974, meetings have been held every Spring or Summer except for 2020 (due to the onset of the Covid-19 pandemic). Annual meetings have most often been held in conjunction with the Learned Societies Conference (now called the Congress of the Humanities and Social Sciences), and such meetings have frequently contained joint sessions with the CSHPS, the Canadian Philosophical Association (CPA), the Canadian Mathematics Education Study Group (CMESG), and the Canadian Society for the History of Medicine (CSHM). In other years, the CSHPM has held their annual meeting in conjunction with the Canadian Mathematical Society (and the CSHPM has also organized sessions in the history and philosophy of mathematics at most of the CMS Winter meetings over the last twenty years). Beginning in 1997, joint meetings with the BSHM have been held in Canada, Britain, Ireland, the United States, and online. There have also been two annual meetings held with the History of Mathematics and Philosophy of Mathematics special interest groups of the Mathematical Association of America.

In 1988, the CSHPM began publishing *Proceedings* of each annual meeting. Initially, the *Proceedings* were available only to members of the society and were not shared with the public, and authors retained full copyright to their work and were free to publish it elsewhere. Twenty-six volumes of these internal *Proceedings* were created, sharing nearly 500 papers on both history and philosophy of mathematics with the membership. Starting with the 2014 annual meeting, the CSHPM entered into a contract with Birkhäuser to publish the *Proceedings* under the title *Research in History and Philosophy of Mathematics* in both eBook and print formats (with the publisher also allowing for the purchase of individual papers rather than the full volume). In 2019, the *Proceedings* were renamed the *Annals of the Canadian Society for History and Philosophy of Mathematics* and opened up to allow for the publication of some papers that had not been presented at the corresponding annual meeting.



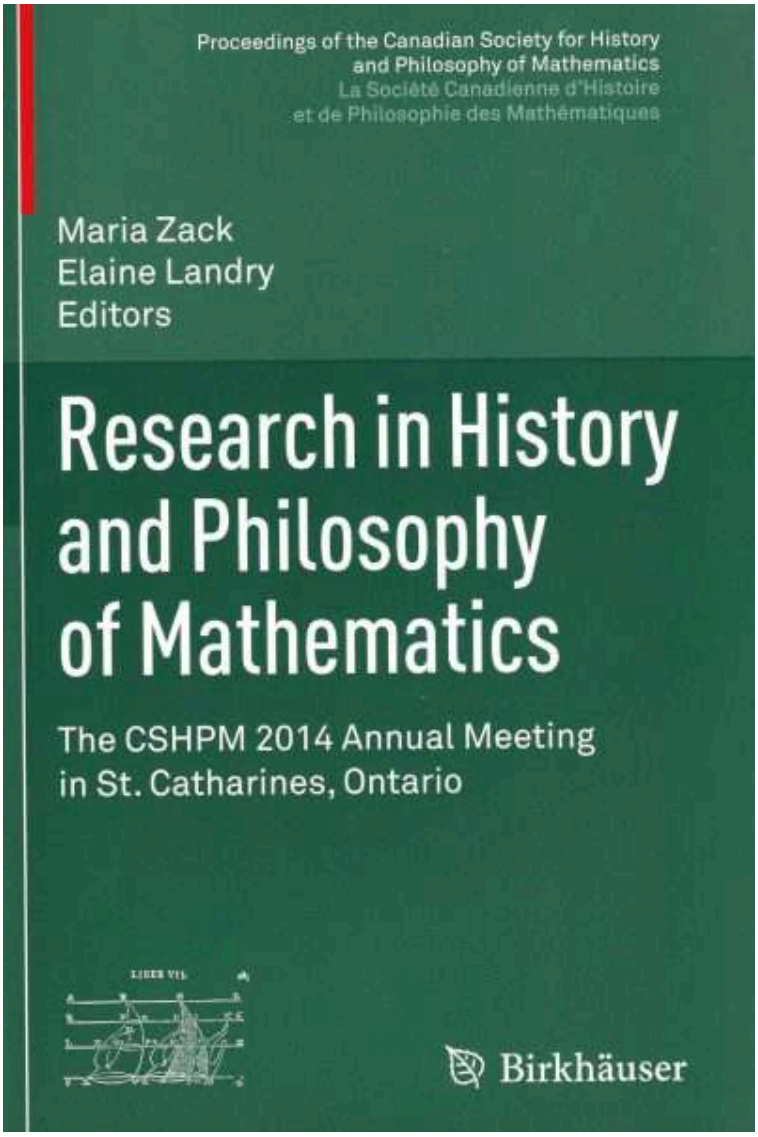




**Figure 5.** First volume of the *Proceedings* (1988) alongside the first volume published by Birkhäuser (2014).

We can conclude with a brief history of this column. First established in the March-April 2014 edition of the *CMS Notes*, the *Notes from the CSHPM* column has endeavored to continue to build connections between the members of the CMS and the CSHPM, and to share information about current research in history and philosophy of mathematics with the wider mathematical community. This column is the 60th installment in that series, and we are grateful for the positive response these columns have received.

*Michael Molinsky is a Professor of Mathematics at the University of Maine at Farmington. He has been a member of the CSHPM for over twenty years, and in the past he has served as both Webmaster and Archivist for the society.*

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# Challenging Norms: Pride Month and Queer Inclusivity in Mathematics

**Dr. Anthony Bonato** (Toronto Metropolitan University)
*Director - Ontario*

June is Pride Month, which is a time each year when the LGBTQ+ community celebrates where we've come from and where we are going. Besides being a celebration, it is a time to remember those who paved the way. Pride is also deeply political and gives a voice to the otherwise voiceless.

The first Pride parade was born from the ashes of the Stonewall riots in Greenwich Village one year earlier in 1969. Led by racialized trans women like Martha P. Johnson and Sylvia Rivera and lesbians like Stormé DeLarverie, the riots were a literal brick thrown throw the window of our collective complacency. On Church Street in Toronto, where my university office resides, the Canadian equivalent of the Stonewall riots occurred on February 5, 1981, when the police raided four gay bathhouses. The first Toronto Pride event followed soon after.

Pride signaled that queer people were no longer going to take a back seat, subject to the whims of the majority and brutalized by police. Pride claimed our power and amplified our voices.

In 2024 in Canada and abroad, the environment remains challenging for queer people. The LGBTQ+ community is experiencing a regressive period, reminiscent to me of the repression during the AIDS crisis in the 1980s. Daily headlines tell the story: provincial and state laws outing queer youth and curtailing the rights of trans people, the criminalization of our identity in many countries, along with the repression of drag, which is a queer art form.

While undeniable progress has been made in queer rights over the last half century in Canada, we're constantly reminded that our hard-fought-for rights can vanish overnight at the stroke of a well-dressed and well-spoken politician's proverbial pen. In times like these, our allies can feel distant, and the silence can be overwhelming.

Whenever I write about queer issues in the math community, I've heard in response that math is math. Math is viewed as an austere subject, removed from the issues affecting the real world. Of course, mathematics, like any scholarly pursuit, doesn't live in a vacuum. People do math. They write out proofs and computations, read and write papers and books, teach the subject, and apply mathematics to solve challenges in the world.

Mathematics is flourishing arguably as much at any point in history, and no one knows where it will be ten, fifty, or a hundred years from now. Have you considered that access to mathematical spaces isn't equally available to all? Women, disabled, Black, racialized, and Indigenous people, as well have queer people, were not always welcome at the blackboard, lecture hall, or editorial board. We won't have a fully flourishing discipline until everyone is represented. That's a tall order and unlikely one that will be realized in my lifetime.

Our subject has been as non-diverse historically as every other, and change happens so slowly. Efforts to bring equity and inclusion to our academic spaces march forward glacially, often met by ambivalence and, lately, outright hostility. In the meantime, out of necessity, LGBTQ+ mathematicians have made their own spaces where they can conduct research, teach, and network.

On this Pride month, besides the parades, office decorating contests, and posts on social media, consider how you can proactively support queer members of the math community in real, tangible ways. We have agency and have the same profession goals that any mathematician does, but we live in a world often hostile to us. Kindness and compassion are the most powerful tools at our collective disposal.

I challenge the members of the CMS and all mathematicians to educate themselves on queer history, struggles, and excellence. Pay attention to what's happening right now and speak up: freedoms are lost for the minority when good people in the majority do nothing. How can you improve things, both in the CMS, in your Department or workplace, and in the world outside our mathematical ivory towers? The rights and livelihood of your LGBTQ+ colleagues depend on those answers.

*Dr. Anthony Bonato's research is in graph theory and network science. He authored over 150 papers with over 120 co-authors. He is the author of five books, with the most recent one An Invitation to Pursuit-Evasion Games and Graph Theory published by the American Mathematical Society in 2022. Bonato is currently a full Professor in the Department of Mathematics at Toronto Metropolitan University.*

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**Stacey Smith?** (University of Ottawa)

*How my experiences with math conferences ended up helping a variety of young trans folks*

Most trans folks undergo gender transition when they're young. That's a fairly broad observation, but one that makes sense to me: if you were assigned the wrong gender at birth, then you tend to do something about it as soon as you reasonably can. However, a few of us didn't quite do it then and left it until later in life, which gives us a bit of a different perspective. For one thing, we aren't dealing with teenage angst at the same time as gender angst (both were quite enough on their own for me!). For another, we've had the chance to build up a few helpful life skills. Not least among those, in my opinion, is networking.

One of the core manifestations of privilege in academia is the ability to find mentors. Having someone more senior to show you the ropes can be a huge shortcut. Conversely, if your PhD supervisor isn't on your side, it's a much harder road to success. Even if your relationship with your supervisor is excellent, you can't just coast along under their wing; you also need letters of reference from a variety of more senior academics for fellowships, job applications, grants, etc. Networking in academia isn't just a formal matter of introductions; it often goes hand-in-hand with social connections and building friendships.

By the nature of our status as social beings, humans tend to form bonds with people similar to themselves. People tend to gravitate to those with the same backgrounds or interests or hometown or whatever. This isn't a universal rule, but it does happen quite a lot. Without any malice, it can easily just fall out that more senior academics tend to make connections with students and postdocs who are more similar to them than not. These is how systems tend to reproduce themselves and why it's critical to have formal programs that interrupt this tendency. Without explicitly getting people outside their comfort zones, it's all too easy for everyone to fall into self-similar groups, which can really hurt marginalised folks. One way to do that is to provide mentoring from unexpected places.

As an academic, I've long been interested in the process of mentoring. I'm co-chair of the mentoring taskforce for the Society for Mathematical Biology because I long ago identified that their mentoring program was a really good way to form connections between junior and senior people from a wide variety of backgrounds. We match individuals at the annual meeting and create group mentoring opportunities for small clusters of people at different career stages throughout the year. I've also mentored quite a few students through other programs or just because they sought me out.

All of which is to say, I was a pretty experienced mentor… and that was before I transitioned. When I first transitioned, my boyfriend (who was director of Planned Parenthood and knew a thing or two about these things) said "You'll be mentoring people in no time." I pushed back, saying "But I have no idea what I'm doing!" To which he replied "Doesn't matter. You have mentoring skills, and you're an older trans woman. That combination is incredibly rare."

Well, it turned out he was entirely right. I was floundering around in my new gender expression, but I did know how mentoring worked. At first, I didn't have a whole lot of information to share, but I did know how to make these connections and give some basic advice. Over time, I started to feel more confident in my gender expression, so that made my mentoring more useful.

Having realised I had some skills to offer, I signed up for some more formal mentoring options. I found a group who were looking for mentors for girls in STEM and desperately needed some mentors for trans girls. Which was a rewarding experience, although many of them had to preface it with "If you talk to my parents, you have to use a different name for me, because I'm not out to them." This was something I hadn't had to face, not having transitioned at that sort of age.

Sometimes these connections were just short term, and sometimes they turned into opportunities for research. One high-school student reached out looking for the kind of mentoring that the conference didn't provide, so I decided to take her on myself… and she was fantastic, producing research in a way that was indistinguishable from my graduate students. I had another high-school student say "I thought I had to choose between being trans and being an engineer. Meeting you made me realise I could be both." Excuse me, there appears to be something in my eye…

Mentoring is one of those things that a lot of academics overlook or only do haphazardly, when the opportunity falls into their lap. Conversely, students, postdocs and junior academics are often in quite desperate need of mentors and don't always know where to find them. This problem gets thornier the more the people move away from the white, male, cisgender, heterosexual archetype. The good news is that these skills are transportable: the nouns may change, but mentoring in one aspect of life can be excellent training for mentoring in wildly different aspects of life.

Whether the issue is finding the right career, dealing with a complicated supervisor or trying to learn the intricacies of makeup for the first time ("Foundation sounds like a pretty fundamental thing, so that should go on first, right? No?"), it turns out that I'm very good at reaching a hand down the ladder to help pull people up. And I've always been very clear that there's a price to this: they too must reach down sometime in the future and help pull the next person up. This is how we make a better world.

*Stacey Smith? is a professor of disease modelling at the University of Ottawa, where she was the first employee to undergo gender transition (but won't be the last). Her mentoring skills in yet another area of academia led her to write a book on academic writing because she was sick of all the poorly written journal articles out there. Check out "How to ~~Write~~^Edit Your Scientific Article" from World Scientific.*

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Warren Bei from Rockridge Secondary in West Vancouver (BC) has been crowned the 2024 Canadian Mathematical Olympiad (CMO) Champion! This remarkable feat is accentuated by the fact that Warren is only in the 10th grade and has secured medals in the 2021, 2022, and 2023 CMOs. Warren has also represented Canada in 3 International Mathematical Olympiads (IMO) from 2021 to 2023, clinching 2 gold medals and one silver. To provide insight into the mind of a budding mathematician and his vision for his future in math, we sat down for an interview with Warren.

*Congratulations Warren! Another big win for you on the CMO. After winning three golds and a silver in the last four years, do the competitions seem to be getting easier for you each year?*

I believe all mathematical problems are intriguing challenges, and those that happen to be in the competitions I write are no exception. The ideas that they task me with rediscovering never cease to amaze me, so I am always excited for hours of fun thinking about new problems.

*What inspired you to start competing in math competitions?*

Ever since I was a child I had liked logic puzzles and scientific books, so one day my parents decided to test my mathematical skills by registering me for a random competition. I did quite well, which began my journey in mathematical competitions.

*What has been your most challenging math problem or competition, and how did you overcome it?*

I believe problem difficulty is highly subjective, because a problem is difficult if and only if one presently does not know how to solve it. To solve any difficult problem, one must rely on intuition to generate ideas and keep trying different approaches.

*Are you focused entirely on mathematics or also interested in other STEM areas?*

Other STEM areas I enjoy are physics and computer science because their problem solving processes are quite similar to that of mathematics. Physics is about formulating situations so that the laws of physics can be applied, and programming is about finding ways to apply known algorithms to problems that appear unsolvable. Both of these subjects are therefore axiomatic systems.

*Do you have some ideas about what you might want to study or do after high school? Any big goals? Do you plan on pursuing a career in mathematics?*

Since the world is always changing, I aim to work forward from the present rather than backwards from a fixed goal. While studying mathematics and computer science in university would probably be the best choice for me, presently I do not know what mathematicians actually do, so I will leave the question of whether to pursue mathematics research for later.

*How has participating in CMS math competitions influenced your academic and personal growth?*

Competitions taught me to always be a creative, curious learner. They introduced me to various new mathematical subjects and taught me problem solving skills, as well as providing opportunities for me to meet like-minded students.

*Who do you admire in mathematics? Do you have role models?*

I admire recreational mathematician and writer Martin Gardner, whose articles showed how various mathematical topics can be interconnected. Two of my favourite books are Winning Ways and GEB, because they weave simple ideas into entire theories. As John Horton Conway said, “when I discovered surreal numbers, I realized that playing games IS math.”

*What advice would you give to aspiring math competitors who are just starting their journey?*

For every seemingly unmotivated solution to a problem, there is a deeper insight that makes it self-evident.

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# Une entrevue avec Warren Bei, champion de l'Olympiade mathématique du Canada 2024

Warren Bei, de Rockridge Secondary à West Vancouver (C.-B.), a été couronné champion de l'Olympiade mathématique du Canada (OMC) 2024 ! Cet exploit remarquable est accentué par le fait que Warren n'est qu'en 10e année et qu'il a obtenu des médailles aux OMC de 2021, 2022 et 2023. Warren a également représenté le Canada à trois Olympiades internationales de mathématiques (OIM) entre 2021 et 2023, remportant deux médailles d'or et une d'argent. Pour donner un aperçu de l'esprit d'un mathématicien en herbe et de sa vision de son avenir dans les mathématiques, nous nous sommes assis pour une entrevue avec Warren.

**Félicitations Warren ! Une autre grande victoire pour vous à l'OMC. Après avoir remporté trois médailles d'or et une d'argent au cours des quatre dernières années, les concours vous semblent-ils plus faciles chaque année ?**

Je pense que tous les problèmes mathématiques sont des défis intrigants, et ceux qui se trouvent dans les concours auxquels je participe ne font pas exception. Les idées qu'ils me demandent de redécouvrir ne cessent de m'étonner, et je suis donc toujours enthousiaste à l'idée de passer des heures à réfléchir à de nouveaux problèmes.

**Qu'est-ce qui vous a incité à participer à des concours de mathématiques ?**

Depuis que je suis enfant, j'aime les énigmes logiques et les livres scientifiques. Un jour, mes parents ont décidé de tester mes compétences en mathématiques en m'inscrivant à un concours au hasard : j'ai obtenu d'assez bons résultats, ce qui a marqué le début de mon parcours dans les concours de mathématiques.

**Quel a été votre problème ou concours mathématique le plus difficile, et comment l'avez-vous surmonté ?**

Je pense que la difficulté d'un problème est très subjective, car un problème est difficile si et seulement si l'on ne sait pas comment le résoudre. Pour résoudre un problème difficile, il faut se fier à son intuition pour trouver des idées et continuer à essayer différentes approches.

**Vous concentrez-vous uniquement sur les mathématiques ou vous intéressez-vous également à d'autres domaines des STIM ?**

Les autres domaines des STIM que j'apprécie sont la physique et l'informatique, car leurs processus de résolution de problèmes sont assez similaires à ceux des mathématiques. La physique consiste à formuler des situations de manière à ce que les lois de la physique puissent être appliquées, et la programmation consiste à trouver des moyens d'appliquer des algorithmes connus à des problèmes qui semblent insolubles. Ces deux sujets sont donc des systèmes axiomatiques.

**Avez-vous une idée de ce que vous pourriez vouloir étudier ou faire après l'école secondaire ? Avez-vous de grands objectifs ? Envisagez-vous de faire carrière dans les mathématiques ?**

Étant donné que le monde est en constante évolution, j'essaie d'avancer à partir du présent plutôt que de reculer à partir d'un objectif fixe. Étudier les mathématiques et l'informatique à l'université serait probablement le meilleur choix pour moi, mais pour l'instant, je ne sais pas ce que font réellement les mathématiciens, et je remettrai donc à plus tard la question de la poursuite de la recherche en mathématiques.

**Comment la participation aux concours de mathématiques de la SMC a-t-elle influencé votre développement académique et personnel ?**

Les concours m'ont appris à être toujours créatif et curieux. Ils m'ont fait découvrir de nouveaux sujets mathématiques et m'ont appris à résoudre des problèmes, tout en me donnant l'occasion de rencontrer des étudiants partageant les mêmes idées.

**Qui admirez-vous en mathématiques ? Avez-vous des modèles à suivre ?**

J'admire le mathématicien récréatif et écrivain Martin Gardner, dont les articles montrent comment divers sujets mathématiques peuvent être interconnectés. Deux de mes livres préférés sont Winning Ways et GEB, parce qu'ils transforment des idées simples en théories complètes. Comme l'a dit John Horton Conway, « lorsque j'ai découvert les nombres surréalistes, j'ai réalisé que jouer aux jeux, c'est faire des mathématiques ».

**Quels conseils donneriez-vous aux aspirants compétiteurs en mathématiques qui commencent leur parcours ?**

Pour chaque solution apparemment non motivée à un problème, il y a une idée plus profonde qui la rend évidente.

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Canadian Mathematical Society
Société mathématique du Canada

# Call for nominations
# Appel de mises en candidature

*2025 CMS*

# Prix Coxeter-James Prize

*2025 de la SMC*

In recognition of young mathematicians who have made outstanding contributions to mathematical research.

En reconnaissance d'un.e jeune mathématicien.ne qui s'est distingué.e par l'excellence de sa contribution à la recherche mathématique.

Submit all documentation to cjprize@cms.math.ca
**no later than September 30, 2024**

Soumettez tous les documents à prixcj@smc.math.ca
**au plus tard le 30 septembre 2024**



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Canadian Mathematical Society
Société mathématique du Canada

# Call for nominations
# Appel de mises en candidature

*2025 CMS*

## Prix Cathleen Synge Morawetz Prize

*2025 de la SMC*

In recognition of outstanding research publication by one or more author(s). A series of closely related publications can be considered if they are clearly connected and focused on the same topic. Subject area for 2025: Algebra, Number theory, Algebraic geometry.

En reconnaissance d'un article de recherche exceptionnel ou d'une série d'articles interreliés et axés sur un même sujet par un ou plusieurs auteur(s). Domaine de recherche pour 2025 : L'algèbre, la théorie des nombres, la géométrie algébrique.

Submit all documentation to csmprize@cms.math.ca
**no later than September 30, 2024**

Soumettez tous les documents à prixcsm@smc.math.ca
**au plus tard le 30 septembre 2024**

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Canadian Mathematical Society
Société mathématique du Canada

# Call for nominations
# Appel de mises en candidature

*2025 CMS*

# Prix Jeffery-Williams Prize

*2025 de la SMC*

In recognition of mathematicians who have made outstanding contributions to mathematical research.

En reconnaissance d'un.e mathématicien.ne ayant fait une contribution exceptionnelle et soutenue à la recherche mathématique.

Submit all documentation to jwprize@cms.math.ca
**no later than September 30, 2024**

Soumettez tous les documents à prixjw@smc.math.ca
**au plus tard le 30 septembre 2024**

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Canadian Mathematical Society
Société mathématique du Canada

# Call for nominations
# Appel de mises en candidature

*2025 CMS*

# Prix Krieger-Nelson Prize

*2025 de la SMC*

In recognition of outstanding research by a woman or a female-identifying mathematician.

En reconnaissance d'une excellente contribution à la recherche mathématique par une mathématicienne s'identifiant au genre féminin.

Submit all documentation to knprize@cms.math.ca
**no later than September 30, 2024**

Soumettez tous les documents à prixkn@smc.math.ca
**au plus tard le 30 septembre 2024**

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**Registration is open!**


## Call for Scientific Sessions

2024 CMS Winter Meeting

November 29- December 2, 2024 | Vancouver/Richmond, BC

The Canadian Mathematical Society (CMS) welcomes and invites scientific session proposals for the 2024 CMS Winter Meeting in Vancouver/Richmond, BC from November 29 – December 2, 2024.

- The purpose of the scientific sessions is to share cutting edge research on a given mathematical topic, as suggested by the organizers.
- Sessions are scheduled blocks, with each block ranging from 2 to 2.5 hours in length, and take place from November 30 to December 2. Typical scientific sessions have between 10 and 20 talks of 20 minutes each, with 10 minutes between talks, but 50-min talks are possible. Indeed, the organizers are welcome to suggest non-traditional usage of the block times and format.
- In accordance with the CMS mandate to propose conferences which are accessible and welcoming to all groups, diversity amongst organizers and speakers is strongly encouraged. To support organizers in their important work and in their efforts towards inclusivity and diversity, the CMS will host an open call for abstracts for all sessions, and asks organizers to consider all eligible abstract submissions for their session.
- Diversity includes topics of interest, career stages, geographic location, and demographics; designated underrepresented groups include, but are not limited to, women, Indigenous Peoples, persons with disabilities, members of visible minority/racialized groups, and members of LGBTQ2+ communities.
- Note that there will be a separate follow-up call for Education Sessions.
- All proposed sessions should be in line with the CMS Code of Conduct.

**Proposals should be submitted online, and will require the following:**

1. Names, affiliations, and contact information for two or three organizers: A lead organizer and one or two co-organizer(s).
2. A title and a two to three-sentence summary that will be posted on the website for potential speakers.
3. The number of session blocks requested (morning blocks are 2.5 hours, afternoon blocks are 2 hours).
4. A pdf file including a description of the topic and purpose of the session (1-2 paragraphs), for consideration by the Scientific Committee, not to be posted.
5. A spreadsheet including a list of possible speakers. Please have columns "Last Name", "First Name", "Affiliation", "Career Stage", and "Webpage", with as much information filled out for potential speakers as possible.

Proposals will be selected by the Scientific Organizing Committee, limited by available classroom space, with priority for sessions that show intention to include a mix of senior and junior researchers, to make parts of their session accessible to graduate students, and to include speakers from designated underrepresented groups.

**A note on Organizers**

The lead organizer should hold a PhD or equivalent in the area of expertise relevant to the session's subject. Having a senior researcher (e.g. Professor or tenured Associate Professor) paired with someone earlier in their career (e.g. tenure track Assistant Professor or Postdoctoral Fellow) would be ideal.

We place great value on your contributions as organizers. Our primary goal is to provide the best possible experience for all attendees, and this is often better achieved by dedicating your efforts to a single, impactful session. As such, we recommend that each potential organizer only propose a single session.

**Submission Form and Deadlines:**

Please submit proposals by filling out this form. There will be two rounds of submissions. Proposals submitted by **June 15, 2024**, will be considered in the first round, with responses ongoing. The deadline for the second round will be **September 15, 2024.**

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**Les inscriptions sont ouvertes !**


## Appel aux sessions scientifiques

Réunion d'hiver 2024 de la SMC

29 novembre au 2 décembre 2024 | Vancouver/Richmond, en Colombie-Britannique

La Société mathématique du Canada (SMC) invite les participants à soumettre des propositions de sessions scientifiques pour la Réunion d'hiver 2024 de la SMC, qui se tiendra à Vancouver/Richmond, en Colombie-Britannique, du 29 novembre au 2 décembre 2024.

- L'objectif des séances scientifiques est de partager la recherche de pointe sur un sujet mathématique donné, tel que suggéré par les organisateurs.
- Les sessions sont programmées en blocs, chaque bloc ayant une durée de 2 à 2,5 heures, et se déroulent du 30 novembre au 2 décembre. Les sessions scientifiques typiques comportent entre 10 et 20 exposés de 20 minutes chacun, avec 10 minutes entre les exposés, mais des exposés de 50 minutes sont possibles. En effet, les organisateurs sont invités à suggérer une utilisation non traditionnelle des horaires et du format des blocs.
- Conformément au mandat de la SMC de proposer des conférences accessibles et accueillantes pour tous les groupes, la diversité parmi les organisateurs et les orateurs est fortement encouragée. Afin de soutenir les organisateurs dans leur travail important et dans leurs efforts en faveur de l'inclusion et de la diversité, la SMC lancera un appel à résumés ouvert pour toutes les sessions et demande aux organisateurs de prendre en considération toutes les soumissions de résumés éligibles pour leur session.
- La diversité comprend les sujets d'intérêt, les étapes de la carrière, la situation géographique et les données démographiques ; les groupes sous-représentés désignés comprennent, sans s'y limiter, les femmes, les peuples autochtones, les personnes handicapées, les membres de minorités visibles/de groupes raciaux et les membres des communautés LGBTQ2+.
- Veuillez noter qu'un appel distinct sera lancé pour les sessions d'éducation.
- Toutes les sessions proposées doivent être conformes au Code de conduite de la SMC.

**Les propositions doivent être soumises en ligne et doivent comporter les éléments suivants :**

1. Noms, affiliations et coordonnées de deux ou trois organisateurs : Un organisateur principal et un ou deux co-organisateurs.
2. Un titre et un résumé de deux à trois phrases qui seront affichés sur le site Web à l'intention des orateurs potentiels.
3. Le nombre de blocs de sessions demandés (les blocs du matin sont de 2,5 heures, ceux de l'après-midi de 2 heures).
4. Un fichier pdf comprenant une description du sujet et de l'objectif de la session (1 à 2 paragraphes), pour examen par le comité scientifique, qui ne sera pas publié en ligne.
5. Un tableur comprenant la liste des orateurs possibles. Les colonnes « Nom », « Prénom », « Affiliation », « Stade de carrière » et « Page web » doivent contenir autant d'informations que possible sur les orateurs potentiels.

Les propositions seront sélectionnées par le comité d'organisation scientifique, dans la limite des places disponibles dans les salles de classe, avec une priorité pour les sessions qui montrent l'intention d'inclure un mélange de chercheurs seniors et juniors, de rendre certaines parties de leur session accessibles aux étudiants diplômés, et d'inclure des orateurs issus de groupes sous-représentés désignés.

**Note à propos des organisateurs**

L'organisateur principal doit être titulaire d'un doctorat ou d'un diplôme équivalent dans le domaine d'expertise correspondant au sujet de la session. L'idéal serait qu'un chercheur chevronné (par exemple, un professeur ou un professeur associé titulaire) soit associé à une personne en début de carrière (par exemple, un professeur assistant titulaire ou un boursier postdoctoral).

Nous accordons une grande importance à vos contributions en tant qu'organisateurs. Notre objectif premier est d'offrir la meilleure expérience possible à tous les participants, et il est souvent plus facile d'y parvenir en consacrant vos efforts à une seule session à fort impact. C'est pourquoi nous recommandons à chaque organisateur potentiel de ne proposer qu'une seule session.

**Formulaire de soumission et dates limites :**
Veuillez soumettre vos propositions en remplissant ce formulaire. Il y aura deux séries de soumissions. Les propositions soumises avant le **15 juin 2024** seront examinées lors de la première série, avec des réponses continues. La date limite pour le deuxième tour sera le **15 septembre 2024.**



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The Canadian Mathematical Society (CMS) welcomes and invites education session proposals for the 2024 CMS Winter Meeting in Richmond, British Columbia, from November 29 to December 2, 2024.

The education session proposals will be selected by the CMS Meeting Education Session Committee, which will also schedule the accepted sessions, in communication with the session co-organizers.

In accordance with the CMS mandate to propose conferences which are accessible and welcoming to all groups, diversity amongst organizers and speakers is strongly encouraged. To support organizers in their important work and in their efforts towards inclusivity and diversity, the CMS will host an open call for abstracts for all sessions, and asks organizers to consider all eligible abstract submissions for their session.

Diversity includes topics of interest, career stages, geographic location, and demographics; designated underrepresented groups include, but are not limited to, women, Indigenous Peoples, persons with disabilities, members of visible minority/racialized groups, and members of LGBTQ2+ communities.

Note that there will be a separate call for Scientific Sessions.

All proposed sessions should be in line with the CMS Code of Conduct.

### Proposals should be submitted online, and will require the following:

1. Names, affiliations, and contact information for all session co-organizers. Early career researchers are welcome to propose sessions.
2. The education session's title, and a two to three-sentence summary that will be posted on the CMS Meeting website if your proposal is selected.
3. A brief description of the topic and purpose of the session (1-2 paragraphs), for consideration by the CMS Education Meetings Committee, not to be posted.
4. Indicate the number of time blocks needed. A block can be between 2 and 2.5 hours in length.
5. A possible list of speakers with their full name and affiliation. An inclusive and diverse set of speakers is highly encouraged.
6. The structure of your session. Traditionally, each presenter gets 20 minutes to talk, 5 minutes of Q&A, and a 5-minute buffer for transition. We are open to different formats as well, such as a panel, interactive session/workshop, 10-minute lightning talks, etc.

Proposals will be selected by the CMS Education Meetings Committee.

The CMS kindly asks session organizers to consider all eligible abstract submissions for their session, as up to 30 speakers per session can be accommodated.

All sessions will take place from November 29 to December 2, 2024.

### Submission Form and Deadlines:

Please submit proposals by filling out this form. There will be two rounds of submissions. Proposals submitted by June 15, 2024, will be considered in the first round, where preference will be given to first round submissions. The deadline for the second round will be September 15, 2024.

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La Société mathématique du Canada (SMC) sollicite des propositions de sessions éducatives pour la Réunion d'hiver 2024 de la SMC, qui se tiendra à Richmond, en Colombie-Britannique, du 29 novembre au 2 décembre 2024. Les propositions de sessions d'éducation seront sélectionnées par le Comité des sessions d'éducation des réunions de la SMC, qui établira également le calendrier des sessions acceptées, en communication avec les co-organisateurs de la session.

Conformément au mandat de la SMC de proposer des conférences accessibles et accueillantes pour tous les groupes, la diversité parmi les organisateurs et les conférenciers est fortement encouragée. Afin de soutenir les organisateurs dans leur travail important et dans leurs efforts en faveur de l'inclusion et de la diversité, la SMC lancera un appel à résumés ouvert pour toutes les sessions, et demande aux organisateurs de prendre en considération toutes les soumissions de résumés éligibles pour leur session.

La diversité comprend les sujets d'intérêt, les étapes de la carrière, la situation géographique et les données démographiques ; les groupes sous-représentés désignés comprennent, sans s'y limiter, les femmes, les peuples autochtones, les personnes handicapées, les membres de minorités visibles/de groupes raciaux et les membres des communautés LGBTQ2+.

Veuillez noter qu'il y aura un appel séparé pour les sessions scientifiques.

Toutes les sessions proposées doivent être conformes au code de conduite de la SMC.

### Les propositions doivent être soumises en ligne et doivent comporter les éléments suivants :

1. Noms, affiliations et coordonnées de tous les co-organisateurs de sessions. Les chercheurs en début de carrière sont invités à proposer des sessions.
2. Le titre de la session d'éducation et un résumé de deux à trois phrases qui sera affiché sur le site Web de la réunion de la SMC si votre proposition est retenue.
3. Une brève description du sujet et de l'objectif de la session (1 à 2 paragraphes), pour examen par le Comité des réunions d'éducation de la SMC, qui ne sera pas publiée en ligne.
4. Indiquez le nombre de blocs de temps nécessaires. Un bloc peut durer entre 2 et 2,5 heures.
5. Une liste d'orateurs avec leur nom complet et leur affiliation, qui ont confirmé ou qui ont exprimé leur intérêt et ont été approchés, avant de soumettre la proposition. Il est vivement recommandé de faire appel à un ensemble d'orateurs inclusifs et diversifiés.
6. La structure de votre session. Traditionnellement, chaque intervenant dispose de 20 minutes pour parler, de 5 minutes de questions-réponses et d'une période transitoire de 5 minutes. Nous sommes également ouverts à d'autres formats, tels qu'un panel, une session interactive ou un atelier, des exposés éclair de 10 minutes, etc.

Les propositions seront sélectionnées par le Comité des réunions d'éducation de la SMC.

La SMC demande aux organisateurs de sessions de prendre en considération toutes les soumissions de résumés éligibles pour leur session, étant donné que jusqu'à 30 orateurs par session peuvent être accueillis. Toutes les sessions auront lieu du 29 novembre au 2 décembre 2024.

### Formulaire de soumission et dates limites :

Les propositions doivent être soumises en remplissant ce formulaire. Il y aura deux séries de soumissions. Les propositions soumises avant le 15 juin 2024 seront examinées lors du premier tour, où la préférence sera donnée aux soumissions du premier tour. La date limite pour le deuxième tour sera le 15 septembre 2024.

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## International Congress of Mathematics

July 23- July 30, 2026

Pennsylvania Convention Center

Philadelphia, Pennsylvania

# Calls for ICM 2026 Satellite Events Proposals

On behalf of the International Mathematical Union, we invite and encourage proposals for "Satellite Conferences" and other possible events to be associated with the upcoming International Congress of Mathematicians (ICM). We hope to encourage a blossoming of activity across the continent to amplify the impact of the ICM.

Such conferences and events should take place within a couple of months of the ICM itself and be held in North America. Please see our webpage at https://www.icm2026.org for submission procedures and criteria for selection. Proposed conferences should involve an international perspective on some aspect of the mathematical sciences. Diversity of participants is strongly encouraged. Organizers should seek sponsorship/funding for their events, as we cannot provide financial support for satellite activities.

**ICM 2026 Committee on Satellite Events**

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