

Canadian Mathematical Society
Celebrating 75 Years!

ANNUAL REPORT 2020

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About CMS

As of December 31, 2020

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*David Oakden (Treasurer)
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Distinguished Awards Selection Committee

Chair: Javad Mashregi (Laval)

Education Committee

Chair: Joseph Khoury (Ottawa)

Endowment Grants Committee

Chair: Franco Saliola (UQAM)

Equity, Diversity and Inclusiveness (EDI) Committee

Chair: Steven Rayan (Saskatchewan)

Finance Committee

Chair: Bradd Hart (McMaster)

International Affairs Committee

Chair: Edward Bierstone (Toronto)

Invested Funds Committee

Chair: David Saunders (Waterloo)

Mathematical Competitions Committee

Chair: Dorette Pronk (Dalhousie)

Nominating Committee

Chair: Alexandre Girouard (Laval)

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Chair: Matthias Neufang (Carleton)

Research Committee

Chair: Kai Behrend (UBC)

Student Committee

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CJM/CMB Editorial Board

Editors-in-Chief CJM: Louigi Addario-Berry and Eyal Goren (McGill)
Editors-in-Chief CMB: Antonio Lei and Javad Mashregi (Laval)

CMS Notes Editorial Board

Editors-in-Chief: Robert Dawson (Saint Mary's) and Srinivasa Swaminathan (Dalhousie)

Crux Mathematicorum Editorial Board

Editor-in-Chief: Kseniya Garaschuk (Fraser Valley)

ATOM Editorial Board

Editor-in-Chief: Vacant

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Editors-in-Chief: Karl Dilcher and Keith Taylor (Dalhousie)

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Denise Charron – Manager, Member Relations
Alan Kelm – Manager, Electronic Services
Termeh Kousha – Executive Director
Zishad Lak – Fundraising and Communications Officer
Yvette Roberts – Manager, Finance & Operations
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Sarah Watson – Manager, Meetings and Events

President's Report

Prof. Javad Mashreghi (Laval)



Dear members of the Canadian Mathematical Society,

I hope you are all safe and cheerful in these special days of our lifetime. We are living in an unusual era, a period which has transformed our lifestyle; we do not teach the same, or conduct research as before, and we do not even communicate as we used to. We live in a totally

different environment now. And yet, even though the pandemic will be over soon, these new habits will stay with us for long after, if not forever.

It has been a challenge to serve the mathematical community for the CMS staff as well as our colleagues in the Executive and Board. Members of the staff worked tirelessly from home, day and night, to keep the torch of CMS aflame. In particular, despite being officially on leave, Dr. Termeh Kousha never stopped helping the Society and devoting her time to resolve the challenging issues. Her navigation of the matters of the Society including the financial difficulties, organization of numerous new activities for younger generation, endless communications with the Cambridge University Press to assure the quality and output of our publications, etc., while caring for a new born during her maternity leave, attest to her involvement and her dedication. I am truly privileged to work with her.

During the last three years, the CMS has committed to promoting equity, diversity, and inclusiveness at all levels. The initial steps were taken by Mark Lewis, who was the President of CMS at the time and created the EDI committee and enhanced the Reconciliation in Mathematics Committee. I had the chance to attend the first Equity, Diversity, and Inclusiveness (EDI) meeting and give a short inauguration speech. Both committees have been very active and successful in addressing various EDI issues as well as coordinating the contributions of the mathematical community to the reconciliation process and devising a strategy to eliminate educational and employment gaps in mathematics between Indigenous students and students from underrepresented and equity-seeking groups and other Canadians.

In the first year of my mandate, there were two challenges, both rather new to the CMS. First, the future

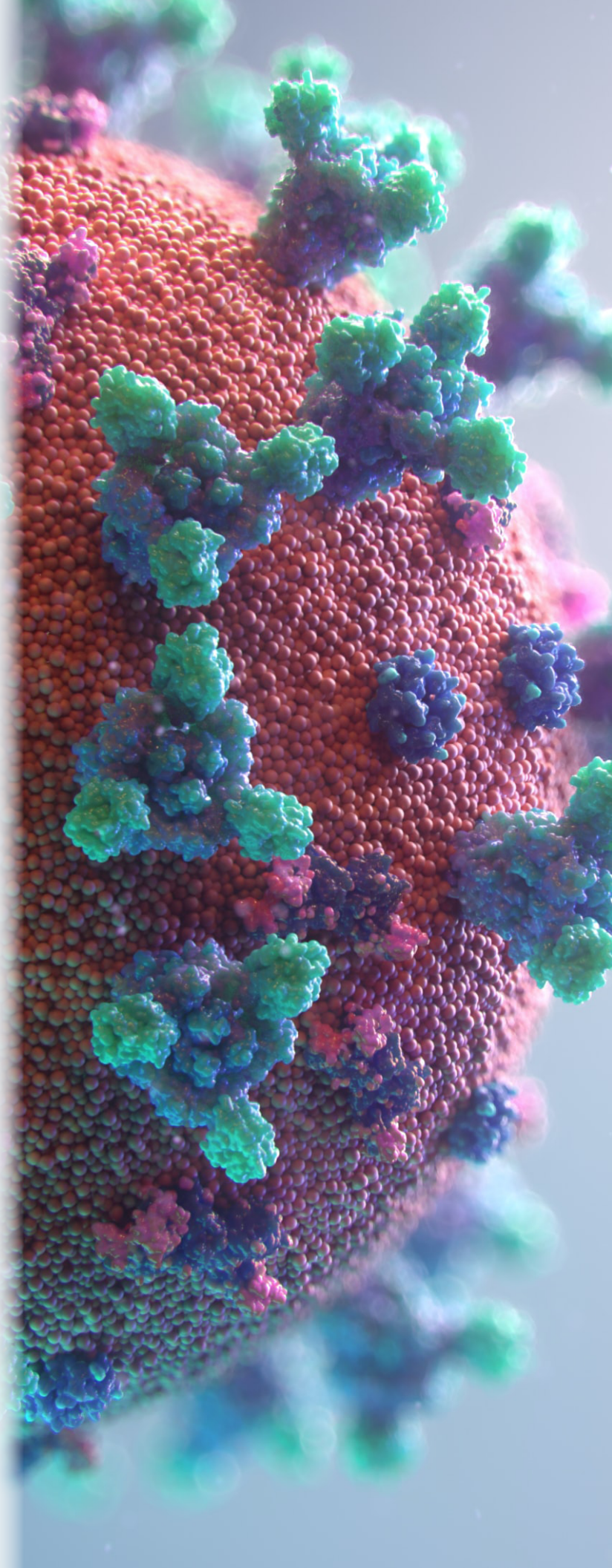
of our publications is still obscure. The publication of the *Canadian Journal of Mathematics* and the *Canadian Mathematical Bulletin* are vital for the CMS. From a financial point of view, they bring a considerable revenue to the Society. They are also prestigious mathematical journals in the world of mathematics. Keeping their style and enhancing their positions among mathematical journals are priorities for our Society. Since the mid 2020s, we have faced numerous changes. On the one hand, the Tech office in Winnipeg does not exist any more to control the quality of publication. On the other hand, the new publisher, Cambridge University Press, has hinted to upcoming Open Access era since the beginning of our mutual collaboration. Based on information we have received, all their journals will be published open access in near future (e.g., from 2024) and CJM and CMB are no exception. While they have been rather successful in Europe in attracting a large number of financial institutions (grant agencies) to join the PlanS and agree to the open access policies of this agreement, North American institutions, and in particular the Canadian ones, have not yet adopted this policy. It is not even clear what would be the strategy of our financial institutions when the matters become more serious. That is why we are facing an undetermined and obscure future for our publications. A lot of thinking is ahead of us. The upcoming President of CMS will directly face this challenge and it is our duty to help the administration as much as possible.

The second item is the creation of Canadian House of Mathematics. I initiated this idea a couple of years ago as VP-Quebec. As many other suggestions, the idea stayed alive and subject to numerous discussions inside the Society. Last year, the Board suggested to take more solid actions. Therefore, an ad hoc committee was formed to pursue the implementation of this idea. I am glad that several important steps have been taken. We have signed an agreement with a very experienced agent and even visited a couple of buildings. As usual the heavy burden is on the shoulders of Termeh, who had to visit the available building with her seven-month-old son. We hope to finalize this process before September 2021.

In the first year of my mandate, there were two challenges, both rather new to the CMS. First the future of our publication,

*and the second item is the
creation of Canadian House of
Mathematics.*

Each year the CMS has the opportunity to recognize outstanding contributions to research, teaching and service in mathematics across Canada by our beloved colleagues. We have numerous focused awards as well as the newly created Fellow Program. The Award laureates for 2020 are Claude Levesque (Laval) for the Graham Wright Award for Distinguished Service, Chao Zhang (Shing-Tung Yau Center of Southeast University, China) for the G. de B. Robinson Award for publication of excellent papers, Veselin Jungic (SFU) the Adrien Pouliot Award for mathematics education, Duncan Dauvergne (Princeton) for the Doctoral prize, Jacopo De Simoi (UofT) for the Coxeter-James Prize for young mathematical researchers, Sujatha Ramdorai (UBC) for the Krieger-Nelson Award for outstanding contributions in the area of mathematical research by a female mathematician, Joseph Khoury (UOttawa) for the CMS Excellence in Teaching Award, and Juncheng Wei (UBC) for the Jeffery-Williams Prize for outstanding contributions to mathematical research. The 2020 Fellows to the Society are Alejandro Adem (UBC), Kai Behrend (UBC), Henri Darmon (McGill), John Friedlander (Toronto), Kathryn E. Hare (Waterloo), Claude Levesque (retired), Robert J. McCann (Toronto), James A. Mingo (Queen's), and Luc Vinet (Montreal). I am proud to congratulate this amazing group for their inspiring contributions to mathematics in Canada.



Prizes & Awards

Jeffery-Williams Prize



Prof. Juncheng Wei (UBC)

Juncheng Wei is awarded the 2020 Jeffery-Williams prize for his exceptional contributions to the theoretical development and interdisciplinary applications of nonlinear partial differential equations.

Dr. Wei's research is remarkable in its breadth, depth, originality and influence. It is broadly concerned with developing tools of mathematical analysis and applying them to shed light on phenomena in physics and biology, which are described by mathematical models.

With an astonishing record of well over 400 publications, Dr. Wei has published in almost all the top journals in mathematics, pure and applied. Journals ranging from the *Annals of Mathematics* and *Inventiones Mathematicae* (top journals in pure mathematics), to the *SIAM Review* (a top journal in applied mathematics) exhibit him as a truly interdisciplinary mathematician. He has been cited over 15000 times, which ranks him among the top most cited mathematicians in Canada.

Juncheng Wei received his Ph.D. in mathematics from the University of Minnesota in 1994. He was postdoctoral fellow at SISSA in Italy before becoming professor at the Chinese University of Hong Kong, where he worked from 1995 until 2012. Since 2012, he has been Canada Research Chair (Tier I) at UBC.

Krieger-Nelson Prize



Dr. Sujatha Ramdorai (UBC)

Dr. Ramdorai (or Sujatha, as she prefers to be known) is a versatile, creative and technically powerful mathematician. She is awarded the Krieger-Nelson Prize for her work that covers a broad range of subjects, including motives, K -theory and arithmetic geometry.

Sujatha first achieved international recognition for her work in the theory of quadratic forms, real algebraic geometry, and motives. She is now one of the leading figures and primary movers in non-commutative Iwasawa theory. For this work Sujatha received the 2006 Ramanujan Prize, the world's most prestigious award for mathematicians working in developing countries. She was elected Fellow of the Indian National Academy of Sciences in 2005. She then served for a few years on the Indian Knowledge Commission, a high-level advisory body to the Prime Minister of India, composed of nine of the country's top academics, economists and business leaders, whose mandate was to guide policy and direct reforms in the areas of education, science, technology, agriculture, industry, and governance.

About a decade ago, Sujatha joined the Mathematics Department at the University of British Columbia as a Tier I Canada Research Chair. At the UBC, she continued her work on motives, K -theory and Iwasawa theory. In recent years, Sujatha has become a bridge between Canadian and Indian mathematical landscapes and has played an important role in opening up opportunities for junior researchers in both countries.



Canadian Mathematical Society

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Coxeter-James Prize



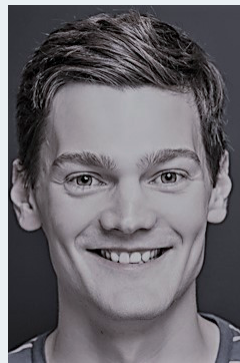
Dr. Jacopo De Simoi (University of Toronto) works mainly in the field of dynamical systems but he has very wide interests spanning from the study of near integrable systems to strongly chaotic ones. He has worked on some of the most prominent outstanding problems in the field, from the study of the standard map to the statistical properties of partially

hyperbolic systems.

Jacopo De Simoi, together with C. Liverani, has published two papers in *Inventiones Mathematicae* which dramatically impact the theory of chaos in slow-fast dynamical systems. Such systems arise naturally in classical problems of Hamiltonian dynamics and should be thought of as having two characteristic time scales; the rough picture of the dynamics can be captured by a suitable averaging of the behaviour of the orbits. By understanding the combination of slow-fast dynamics as a small random perturbation of the averaged dynamical system, De Simoi and Liverani proved that it exhibits a strong form of chaos for a new class of dynamical systems which forms an open set in a parameter space.

After obtaining Bachelor's and Masters' degrees in Physics from the University of Pisa in Italy, Jacopo De Simoi received his Ph.D. in mathematics from the University of Maryland in 2009. He has held postdoctoral positions in Paris, Rome, and Toronto, before moving to the University of Toronto in Mississauga, where he has been assistant professor since 2016.

Doctoral Prize



Dr. Duncan Dauvergne is an exceptional mathematician whose recently completed PhD thesis comprises several outstanding results unexpected at this stage of one's career. Duncan solved, or significantly contributed to solving, three open problems in probability explaining, among other things, a phenomenon that tantalized researchers in

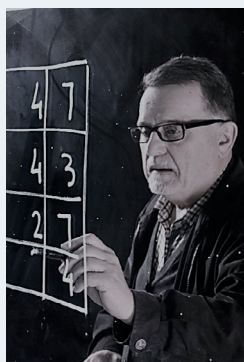
probability, combinatorics and statistical physics. This phenomenon is, in essence, that random systems behave in surprisingly non-random ways.

In 2007, examples and empirical results for such a phenomenon that appears in random sorting networks led to a number of conjectures. Among them, there was a strong conjecture that Duncan Dauvergne solved implying the validity of all the others. Further work of Dauvergne, joint with Janosch Ortmann and Bálint Virág, on constructing the scaling limit of last passage percolation and understanding the geometry of the Robinson-Schensted-Knuth (RSK) bijection was deemed central to the Kardar-Parisi-Zhang (KPZ) universality class and will likely lead to more important results in this area of probability. Equally praised by experts is Dauvergne's joint work with Thomas Bloom on the global asymptotics of the complex zeros of random polynomials.

Duncan Dauvergne completed his PhD at the University of Toronto under the supervision of Bálint Virág in 2019. He is the author and co-author of several articles published in professional journals such as *The Annals of Probability*, *Annales de l'Institut Henri Poincaré*, and *Transactions of the AMS*. Since September 2019, Duncan Dauvergne is an instructor and NSERC postdoctoral fellow at Princeton University.



Adrien Pouliot Award



Veselin Jungic (Simon Fraser University) is the recipient of the 2020 Adrien Pouliot Award in recognition of his outstanding contributions to mathematics education.

Veselin, also known lovingly as Veso in the mathematics community, is a Teaching Professor at the Department of Mathematics, Simon Fraser University. He has been teaching mathematics at the post-secondary level since 1978. Dr. Jungic is a 3M National Teaching Fellow and a recipient of several teaching awards, including the Canadian Mathematical Society Teaching Award and the Pacific Institute for Mathematical Sciences Educational Award. Most of his research is in Ramsey theory and the field of mathematics education and outreach. He has authored and co-authored papers with numerous educational themes, mostly based on his own teaching practices.

One of his most remarkable accomplishments is the creation of the Math Catcher program. The Math Catcher Program has strong Indigenous components and it is in many ways inspired by Indigenous storytelling traditions. For example, in collaboration with Dr. Mark MacLean (2015 Adrien Pouliot Award), Dr. Jungic has created 25 animated films in nine First Nation languages.

Throughout his career, Dr. Jungic has pushed forward our understanding of mathematics education and implemented practical solutions for teaching. He has documented his work in a series of over 40 math education-related publications in order to share his experiences with others.

Despite all this impressive work, he has still found the time to run 18 marathons.

Excellence in Teaching Award



Dr. Joseph Khoury (University of Ottawa) has been a lecturer at the University of Ottawa for over 20 years. He received his B.Sc. (Hons.) from the Lebanese University in Beirut and his Ph.D. from the University of Ottawa in 2001, for a thesis focused on types of locally nilpotent derivations, a subject linked to Commutative

Algebra and Algebraic Geometry. Since 2001, Dr. Khoury has also held the position of coordinator of Math Help Centre in the Department of Mathematics and Statistics at the University of Ottawa where he also leads the department's outreach program. He has received many awards and honours throughout his career including the Part-Time Professor of Year Award, which is the University of Ottawa's most prestigious award for teaching by a Lecturer, the Outstanding Contribution to Students' Experience Award, and the CMS Distinguished Service Award. He has inspired countless students and many colleagues with his passion for teaching and mathematics education.

Beyond his excellence and dedication to student success in the classroom, Dr. Khoury is also a national visionary and leader in mathematics education. He has organized and developed several highly successful outreach programs such as Math Horizons Day and the annual CMS Math Camps (the largest of its kind across Canada), as well as several Education Sessions at various conferences.

Dr. Khoury has also published a number of scientific articles in referred journals and is currently writing his third book entitled *A tale of Discrete Mathematics*. He and his wife Antoinette have three children. He enjoys, among other things, music, history, and international political affairs.



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G. de B. Robinson Award



Dr. Chao Zhang (Shing-Tung Yau Center of Southeast University, China) is the recipient of the 2020 G. de B. Robinson Award for a paper published in the Canadian Journal of Mathematics in 2018-2019.

Professor Chao Zhang is being recognized for his paper “Ekedahl-Oort Strata for Good Reductions of Shimura Varieties of Hodge Type”

(Canad. J. Math. 70 (2018), no. 1, 451-480).

The work of Zhang is devoted to the study of Shimura varieties. These varieties have become a valuable tool in modern Number Theory. Their étale cohomology constitutes one of the ways to construct Galois representations. They also provide concrete incarnations of automorphic forms realized as modular forms. Zhang introduces stratifications of the special fibers of Shimura varieties of Hodge type in odd characteristics into spaces that are easier to understand, e.g., they are quasi-affine and smooth.

Dr. Zhang is currently an Associate Professor of Shing-Tung Yau Center of Southeast University in Nanjing, China. After finishing his graduate study in China, he received a scholarship from the Erasmus Mundus ALGANT-DOC doctoral program, and became a Ph.D. student at Leiden University and at the University of Milan, with advisors Prof. Bas Edixhoven and Prof. Fabrizio Andreatta. Upon obtaining his Ph.D. in 2013, he started a postdoc in the Yau Mathematical Sciences Center (Tsinghua University, Beijing) and the Institute of Mathematics of Academia Sinica (Taipei). He joined Southeast University in December 2019.

Graham Wright Award for Distinguished Service



Dr. Claude Levesque (Laval) has made sustained and distinguished contributions to the Canadian mathematical community and, in particular, to the Canadian Mathematical Society (CMS) in numerous ways. He organized three influential CMS conferences at his home university, Laval. As an organizer, he had a strategy of

developing conferences with many special sessions. While the diversity of sessions at these meetings served the broader mathematical community, the meetings also broke attendance records.

Claude Levesque was devoted to fostering and developing publications to serve the Canadian mathematical community. He served for many years as Editor and Editor in Chief of *Annales des sciences mathématiques du Québec*, a joint publication with the Institut des sciences mathématiques du Québec (ISM) and the Centre de recherche mathématique (CRM). When conditions changed, and the journal needed a new home, he helped transition this journal to a new Springer journal, *Annales mathématiques du Québec* (AMQ), where it enjoyed great success, with papers from top mathematicians.

Claude Levesque finished his undergraduate studies at Université Laval in 1970 where he then continued his studies and received his master's degree in mathematics in 1973. In the following years, Dr. Levesque completed his Ph.D. at the Illinois Institute of Technology. He has been teaching at Laval University since 1986, but has served as invited professors in many different universities such as University of Hawaii, Concordia University and University of Saga.





Juncheng Wei wins the 2020 Jeffery-Williams Prize



Veselin Jungic wins the 2020 Adrien Pouliot Award (award received is similar to above)



Joseph Khoury wins the 2020 Excellence in Teaching Award



Sujatha Ramdorai wins the 2020 Kriegler-Nelson Prize



Jacopo De Simoi wins the 2020 Coxeter-James Prize



Claude Levesque wins the 2020 Graham Wright Award (award is similar to above)

CMS Fellows

The CMS congratulates the Third Class of Fellows

The Canadian Mathematical Society is pleased to announce the 2020 Class of Fellows consisting of 9 members from the Canadian mathematical community. The 2020 Class of Fellows was recognized at the CMS virtual Winter Meeting in December.

CMS 2020 Class of Fellows:

Alejandro Adem (UBC)

Kai Behrend (UBC)

Henri Darmon (McGill)

John Friedlander (Toronto)

Kathryn E. Hare (Waterloo)

Claude Levesque (retired)

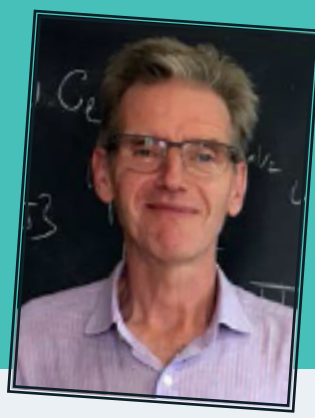
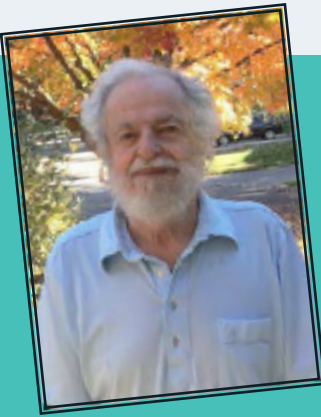
Robert J. McCann (Toronto)

James A. Mingo (Queen's)

Luc Vinet (Montreal)

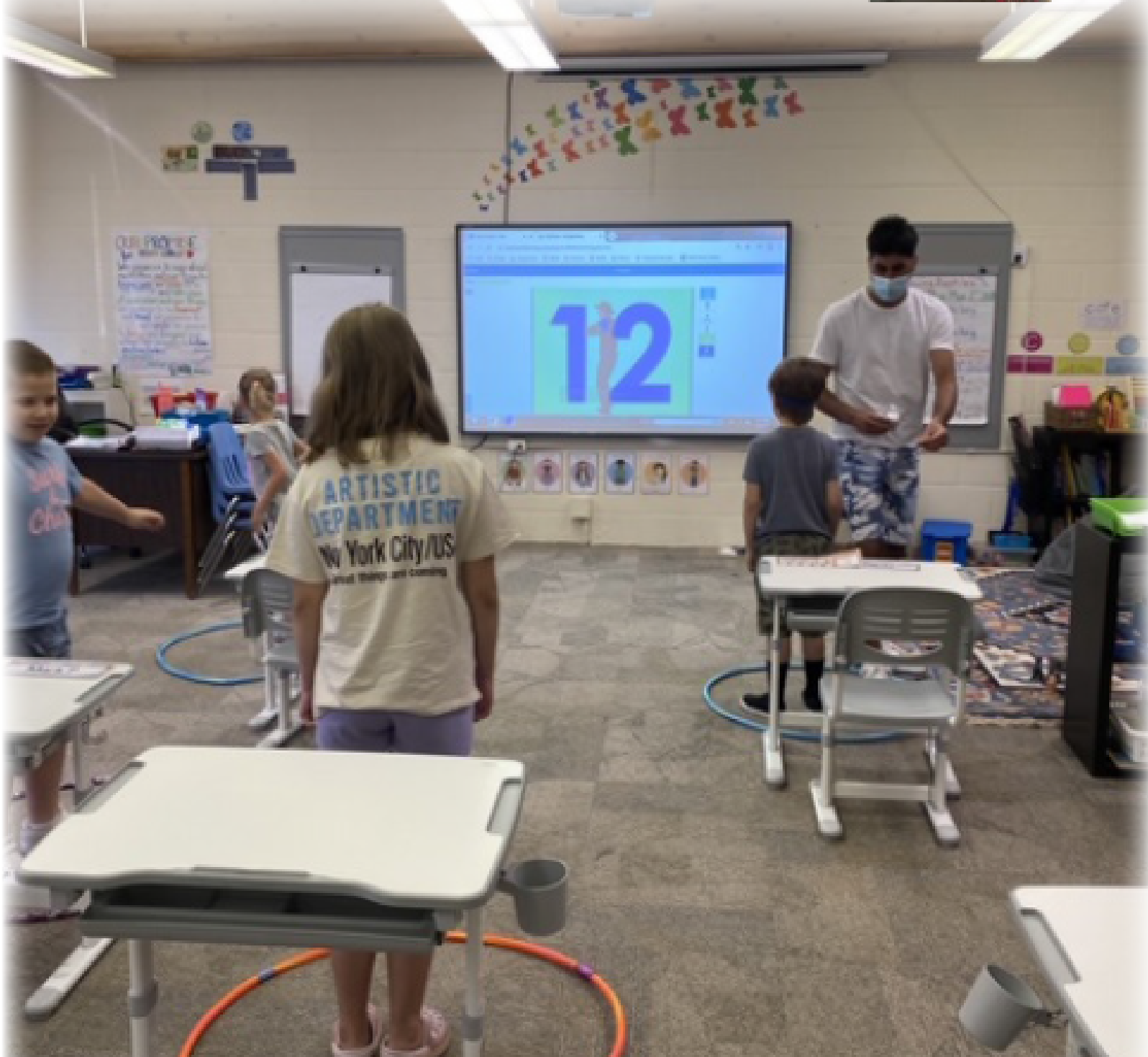
The Fellows Program was instituted to recognize mathematicians who have made very significant contributions to the profession and to the Canadian Mathematical Society. Fellowship recognizes CMS members who have made excellent contributions to mathematical research, teaching, or exposition; as well as having distinguished themselves in service to Canada's mathematical community.

Induction to the Third Class of Fellows was based upon nominations or a recipient of a CMS prize or award for outstanding contributions for research, education, exposition and service to the Society.



Math Camps

Each summer, CMS Math Camps provide students with an interest in mathematics with a unique and unforgettable experience. The camps take place in universities and CEGEPs across Canada and range from day camps to week-long events. Students who attend the camps leave with new friends, new ideas, and a new outlook on mathematics. CMS Math camps are a great opportunity to enhance skills and knowledge, gain a new perspective on mathematics and make new friends with similar interests. Many 2020 camps were cancelled or held virtually due to the COVID-19 pandemic. The CMS offered 1 Regional Camp, 4 National Camps and 5 Specialty Camps.



Meetings

CMS COVID-19 Research and Education Meeting (CCREM) July 13 – 16 - Online Meeting

The CMS had to postpone the 2020 CMS Summer Meeting planned for June due to the COVID-19 pandemic. Since we could not hold a meeting in person, the CMS provided an online platform for mathematicians to come together and learn during a difficult time. We felt that a meeting focused on the changes caused by COVID-19 to the way we plan, teach and do research would be of great benefit to the Canadian mathematical community.

The meeting was conceived in April 2020 and held in July 2020. In 3 months the CMS and our ambitious scientific directors, Kseniya Garaschuk (University of the Fraser Valley) and Julien Arino (University of Manitoba) put together a scientific organizing committee, and recruited four plenary speakers and eight sessions for the event.

The conference opened with a welcome and a session on public policy and academic integrity. Over the course of four days, we heard from four plenary speakers including Pauline van den Driessche (Victoria), Stan Matwin (Dalhousie), Daniel Coombs (UBC) and Jim Fowler (Ohio State). The meeting had a strong focus on education and included a joint panel with the Canadian Mathematical Education Study Group (CMESG) titled “What COVID might teach us about the broad strokes of student assessment” organized by Richelle Marynowski (Lethbridge) and Peter Taylor (Queen’s) with brief commentaries by Peter Liljedahl, Lisa Lunney Borden and Richelle Marynowski, followed by an open discussion. The other panel titled “Voices of diversity: Students in a University Math Classroom” organized by Kseniya Garaschuk (University of the Fraser Valley) and Veselin Jungic (SFU) served as a forum to hear students’ voices and discuss student supports in a time of crisis.

The meeting had eight sessions and panels in both research and education including:

- COVID-19 and Public Policies
- What COVID might teach us about the broad strokes of student assessment (panel)
- When a Door Closes... The Creative Fallout of the Pandemic
- K-12 Education Session

- Design and Teaching of Online and Remote Mathematics Courses
- Academic Integrity in the Remote Classroom
- Modelling in Biomathematics: COVID-19 and beyond
- Voices of diversity: Students in a University Math Classroom (panel)

Overall the meeting brought in over 200 attendees from across Canada and featured a math escape adventure, and a Math Code Names Social. In addition to these activities, the meeting also hosted an NSERC town hall.

The CMS would like to acknowledge the support from the sponsors and the Scientific Directors, Kseniya Garaschuk, and Julian Arino, and the entire scientific organizing committee for their part in making the first online meeting of the CMS such a success.

2020 CMS Winter Meeting

Over 780 mathematicians were welcomed to the online platform for the 2020 Online CMS Winter Meeting from December 3 to 8th. This was the second online meeting the CMS has hosted. Participants attended 30 scientific sessions; three plenary lectures; three prize lectures and one public lecture over the course of the meeting. The plenary lecturers were Nicolas Bergeron (École normale supérieure); Irene Fonseca (Carnegie Mellon’s Center for Nonlinear Analysis (CAN)); and Yvan Saint-Aubin (Université de Montréal).

The official conference opened on Friday morning with an opening and welcome given by CMS President, Javad Mashreghi followed by a panel discussion on COVID-19. At the end of the opening day, CMS hosted their first MITACS Public Lecture featuring Alicia Carriquiry (Iowa State) on “Statistics, Mathematics, and the Fair Evaluation of Evidence.”

Following the public lecture, the CMS Student Committee (STUDC) hosted a student social giving students a chance to network and interact in a non-academic setting in a relaxed atmosphere buoyed by icebreaker activities. Mathematically themed games were also played.

During the 2020 Winter Meeting attendees were able to network with peers and like-minded individuals on the online community boards and in our networking sessions. The CMS committees for Equity, Diversity, and Inclusiveness (EDI) and Women in Mathematics invited all participants to participate in several EDI-themed activities taking place during the meeting

including breakout rooms which discussed: a thought-provoking letter written by members of the association for European Women in Mathematics on proactive steps that universities can take to address the impact of the Covid-19 pandemic on underrepresented and marginalized groups in the mathematical sciences; challenges faced by parents of young children and challenges faced by mathematicians from underrepresented groups; supporting LGBTQ+ mathematicians; and supporting early career researchers. The committee wrapped up with a panel/social on Monday evening to report on their impressions and further discuss challenges people are facing and the supports they need.

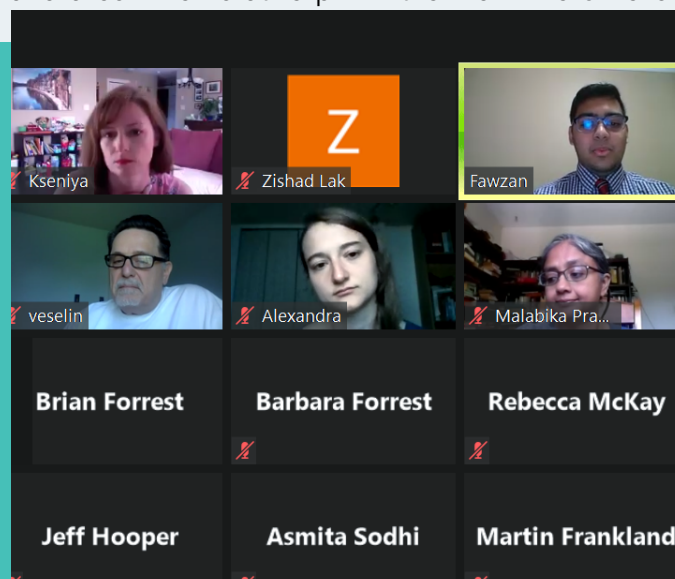
There was not an awards banquet in 2020, but the CMS recognized our 2020 prize winners in a video during the conference opening. Those recipients include: Duncan Dauvergne (Princeton) recipient of the Doctoral prize; Jacopo De Simoi (Toronto) recipient of the Coxeter James Prize; Veselin Jungic (Simon Fraser University) recipient of the Adrien Pouliot Prize; Claude Levesque (Université Laval) recipient of the Graham Wright Award for Distinguished Service; and Dr. Chao Zhang (Shing-Tung Yau Center of Southeast University in Nanjing, China) recipient of the G. de B. Robinson Award.

The winners from the summer were also recognized including Juncheng Wei (UBC) recipient of the Jeffery-Williams Prize; Joseph Khoury (Ottawa) recipient of the Excellence in Teaching Award; and Sujatha Ramdorai (UBC) recipient of the Krieger-Nelson Prize.

The Student Poster Awards were also presented: AARMS Prize: Maryam Basiri (Ottawa); CMS President's Prize: Jose Avilez (Waterloo); and CMS

Student Committee Prize: a tie between Benoît Corsini (McGill) and Aaron Slobodin (Victoria).

During the opening ceremony, the Class of CMS Fellows was given presented and sent their certificate and a commemorative pin in the mail. The 9 Fellows



were acknowledged in a media release on June 26. Putting on such a meeting requires much dedication and hard work and would not be possible without the efforts of the scientific directors, the session organizers, and the CMS staff. Michael Lipnowski and Brent Pym (McGill), the Scientific Directors, handled the transition to an online meeting very well, and put a tremendous amount of hard work into bringing an attractive and varied online program and greatly deserve our thanks.

The CMS would like to acknowledge the financial support from McGill University, MITACS, PIMS, FIELDS, CRM, AARMS, and DigitalEd.



The 2020 CMS Winter Meeting was planned to take place in Montreal

Committee Reports

CMS Equity, Diversity, and Inclusiveness (EDI) Committee

Chair: Steven Rayan (Saskatchewan)

The EDI Committee is a brand-new CMS standing committee that I have had the privilege of chairing these past several months. Formed in June 2020 and populated over the summer by the Nominations Committee, we have been holding monthly meetings of the EDI Committee since mid-September. The formation of the EDI Committee comes at a crucial time as our society continues to face shocking and inexcusable examples of inequity, including but not limited to the extent to which everyday life is a highly racialized experience. It would be patently false to assume that academic departments and the working lives of mathematical scientists are somehow immune to these inequities. Both a cause and an effect of these pervasive inequities is the fact that Science / Technology / Engineering / Mathematics (STEM) suffers in general from a pronounced lack of diversity in its ranks. At the same time, we face an EDI catastrophe through the heightened pressures that the COVID-19 pandemic is exerting upon caregivers and underrepresented groups in the mathematical sciences.

The membership of the EDI Committee is Habiba Kadiiri (Lethbridge), Elana Kalashnikov (Harvard), Karen Meagher (Regina), Israel Ncube (Alabama A&M), Monica Nevins (Ottawa), Reila Zheng (Toronto), and myself. The committee includes full professors, associate professors (one just recently tenured and an assistant professor at the time of joining the committee), a postdoctoral fellow, and a graduate student. Prof. Meagher is also Chair of the CMS Women in Mathematics Committee, with whom our committee works closely. Prof. Nevins represents the Executive on our committee. I have benefited from the tremendous expertise of my fellow committee members at numerous junctures.

Closing the Gap. The first task for our committee occurred in cooperation with the Competitions Committee on the Closing the Gap project, which has provided resources for students identifying as Indigenous and Black to participate in the Canadian Open Mathematics Competition (COMC) and the new Canadian Mathematical Gray Jay Competition. The EDI

Committee helped to review the promotional materials with an eye to diversity, and some of our committee members were instrumental in recruiting educators to deliver contest preparation webinars for the students. We appreciate the efforts of Termeh Kousha, Zishad Lak, Gosia Skrobutan, Sarah Watson, and others in the CMS in bringing this project to fruition.

EWM Letter. Another task that the EDI Committee has taken on was to assess a letter shared with the CMS by the Association of European Women in Mathematics (EWM). The letter makes plain the impact that COVID-19 is having on caregivers, underrepresented groups, and early-career researchers working in academic departments. It furthermore enumerates proactive measures that universities might enact to mitigate this impact. After much discussion and reflection, our committee produced a resounding endorsement of the letter, leading the CMS to publicly endorse the letter. The letter and our written endorsement has subsequently been sent to the entire membership and will be sent to directors of the mathematics institutes in Canada.

CMS Meeting EDI Components. We have also been working to ensure that EDI-related activities are standing components of each CMS Meeting. With this in mind, the 2020 Winter Meeting featured six EDI activities, ranging from breakout rooms on specific topics (e.g. supporting LGBTQ+ mathematicians, the effect of COVID-19 on caregivers) to a panel session and virtual social gathering. The activities were very well attended. The panel session, which we planned to host for one hour, ran for nearly two and a half hours! Prof. Monica Nevins is writing an article for the CMS Notes that will highlight some of the discussions from the Winter Meeting EDI sessions. We plan to use our experiences running these activities to update the CMS Meeting Organizers' Handbook. We are thankful again to Zishad Lak and Sarah Watson for their efforts in advertising the meeting's EDI components and for connecting us with student leaders to help moderate our breakout sessions.

Code of Conduct. We have also paid attention to the role that codes of conduct play in maintaining safe spaces for mathematicians from underrepresented and marginalized groups. The EDI Committee passed a motion at our November meeting calling for new CMS members to explicitly agree to the CMS Code of Conduct when they join or renew their memberships. This motion, which is designed to remind all of

our members of the importance of inclusivity, was presented to the Executive in December and approved.

Upcoming Projects. The committee is brainstorming ideas around nurturing and connecting EDI committees in mathematics departments around the country, as well as taking a national snapshot of EDI challenges faced by those working in mathematics. This data collection exercise would equip the CMS with knowledge of where its advocacy can help most.

The committee looks forward to taking on various projects that help to improve the EDI landscape in Canada for working mathematicians, students, and other stakeholders. We appreciate any feedback, ideas, or lived context from CMS members.

2020 Women in Math Committee Report

2020 was a very challenging year for everyone, including the Women in Math Committee. Our activities for the year were limited, most people on the committee were overwhelmed with teaching obligations and research, while working from home (often with children!) That being said, this year we focused on four things.

1. Several of our members' terms ended. We were happy to welcome Adriana-Stefania Ciupeanu (Manitoba), Amy Hurford (Memorial), and Jessica Lin (McGill) to the committee, and Karen Meagher (Regina) will be the chair of the committee. Two more members' terms expired at the end of 2020, so we hope to welcome two more members to this committee this year. With so many new members on the committee, we will take some time to decide what direction and new initiatives we want to undertake in 2021.

2. We expressed our support for the letter published by the European Women in Mathematics recognizing the impact of COVID-19 pandemic on female mathematicians. It is important to acknowledge the unequal impact of COVID-19, many of us on the committee are living what the European Women in Math expressed in the letter, and we appreciate their initiative.

3. We also supported the EDI committee's panels at the CMS winter meeting. These panels were well received and constructive. It is clear that there is a strong desire for conversations about EDI considerations. We would like to support the initiation of a regular EDI event at the summer and winter CMS meetings.

4. We are planning the Connecting Women in Math Across Canada (CWIMAC) workshop. We had originally

planned to have this meeting in the days before the 2020 summer CMS meeting. Due to COVID-19, both the meeting and the workshop were rescheduled for the 2021 summer. Funding for the CWIMAC workshop has been secured, and we will decide on the format and schedule closer to the event.

Education Committee

Chair: Joseph Khoury (Ottawa)

The year 2020 was certainly not a usual year in any sense of the word. The impact the pandemic had on both faculty and students alike was enormous and will continue to affect the way we conduct activities in academia for years to come. Education activities to enhance and encourage the learning and appreciation of Mathematics are at the heart of the CMS mandate. Unfortunately, these activities suffered a serious setback in 2020 as colleagues across the country focused their energy and time on finishing academic courses to the best of their abilities. In spite of all the challenges, the CMS education committee continued to conduct the essential tasks it was mandated for, namely selecting laureates for the CMS prestigious education awards (Adrien Pouliot and the CMS Excellence in Teaching awards), helping to organize education sessions for the two meetings, deciding on funding and overseeing the Math Camps program of the Society.

The following is a summary of various activities the committee was involved in:

1. The Committee continued to work with the office of the Prime Minister Award for Early Education and Education in Technology. Some CMS members were selected to serve as regional evaluators. The chair of the committee continued to serve in this role on behalf of the CMS.
2. The Committee selected Veselin Jungic from Simon Fraser University (British Columbia) as the recipient of the 2020 Adrien Pouliot Award. The Adrien Pouliot Award was inaugurated to recognize individuals or teams of individuals who have made significant and sustained contributions to mathematics education in Canada.
3. The Committee selected Joseph Khoury (Ottawa) as the recipient for the 2020 CMS Excellence in Teaching Award. The prize recognizes sustained and distinguished contributions in undergraduate teaching.

4. In 2020, there were 16 requests for funding for the Provincial competitions grants. Because of the pandemic, most of these events were unfortunately cancelled.

The 2020 summer meeting was cancelled because of COVID-19 and was replaced by a research and education virtual meeting. The CMS Winter meeting also took place virtually. Both meetings included interesting education themes in consultation with the education committee.

In 2020, the committee approved funding for 23 regional camps across Canada (with at least one in every province). Unfortunately, most of them were cancelled and only three took place virtually because of COVID-19.

Endowment Grants Committee

Chair: Franco Saliola (UQAM)

Members:

- Tim Alderson (UNB-Saint John)
- Heinz Bauschke (UBC-Okanagan)
- Michael Kozdron (University of Regina)
- Adam Van Tuyl (McMaster University)

The CMS Endowment Grants Committee adjudicates proposals for projects that request financial support from the CMS Endowment Grants Competition.

In 2020, the committee reviewed the EGC Terms of Reference and made several recommendations to the CMS. The recommendations served to update the operating procedures for the EGC and to clarify the role and responsibilities of the EGC.

In addition, the EGC decided on two changes to help respond to difficulties related to the current pandemic. Firstly, the 2020 competition was postponed: applications will be accepted on June 1, 2021. Secondly, the 2019 award holders were permitted to reallocate their funds to support an online or a postponed version of the originally planned activity.

Finance Committee

Chair: Bradd Hart (McMaster)

As with so much this past year, the pandemic dominated the issues faced by the finance committee. At its April meeting, it was realized that the current budget made little sense in the current situation. The summer annual meeting needed to be drastically changed and the winter meeting, with more lead time,

was fully online but still did not produce the expected revenue from an in-person meeting. The revenue losses were partially made up from government subsidies in the form of salary subsidies, rent subsidies (for the administrative offices) and partially forgivable loans. Together with the Legacy fund, the Society is in no immediate financial danger but the finances will have to be looked at carefully as the pandemic winds down. The Finance Committee did endorse the idea of the CMS investigating purchasing property in Ottawa as a permanent home for the Society - the House of Mathematics project.

International Affairs Committee

Chair: Edward Bierstone (Toronto)

The International Affairs Committee (IAC) acts as a liaison between the Canadian mathematical sciences community and international organizations whose activities relate to the mathematical sciences and mathematics education. The Committee includes representatives of the Canadian Applied and Industrial Mathematics Society (CAIMS), the Canadian Mathematics Education Study Group (CMESG), and the Statistical Society of Canada (SSC).

Among its main liaison activities, the IAC serves as Canada's national committee for mathematics, representing the National Research Council of Canada (NRC) in its relation with the International

Mathematical Union (IMU). Canada has been a member of the IMU since 1932. The NRC is Canada's Adhering Organization to the IMU, responsible for the payment of Canada's dues as a top category "Group V" country (a status it has had since 1998). The national committee represents Canada's mathematical community, so that diversity, continuity and renewal are all important to its activities in maintaining a good and stable relationship between the NRC and the IMU.

During the year 2020, formal channels of contact between the NRC and IAC were established in order to facilitate communication between the NRC and IMU via the IAC. Following CMS practice, the IAC collaborated with the Research Committee on the nomination of speakers for ICM 2022 in St. Petersburg.

Invested Funds Committee

Chair: David Saunders (Waterloo)

The Invested Funds Committee of the Canadian Mathematical Society met on Friday, April 17, 2020,

and again on Tuesday, October 13. All members of the committee (C. Hyndman, R. Makarov, D. Saunders and L. Seco) attended both meetings. The April meeting was also attended by Termeh Kousha from the CMS, and the October meeting by Terence Sawchuk and Wendi Zou from TD, who will be taking over from Terence as TD's relationship manager with the CMS.

It's been an up and down (or down and up) year. With negative performances in the first quarter (-6.5%) due to the severe market downturn caused by the COVID-19 pandemic, but recovery since, so that even by June overall year-to-date returns were 1.7%. Over the year equity returns have stabilized, and we had some strong returns on bonds driven by decreasing interest rates, although this cannot be expected to continue long-term.

The portfolio is well diversified, conservative, and passively invested across funds. We are somewhat underweighted in equities with respect to comparable investors, a conscious decision taken due to concerns about market volatility. At both meetings, the committee reviewed the current target asset mix. The current target asset mix is 30% Canadian Bonds, 15% Canadian Equities, 30% Global Equities, 25% Cash and Equivalents. As mentioned above, the allocation to equities is lower, and the allocation to cash and equivalents higher than one might typically expect in a portfolio of this type. Some discussion was devoted to investment in possible new asset classes (such as global bonds or high-yield bonds) for additional diversification benefits. The committee decided to maintain the current target asset mix for the time being, and to revisit the issue at subsequent meetings.

Mathematical Competitions Committee

Chair: Dorette Pronk (Dalhousie)

The Mathematical Competitions Committee (MCC) oversees the Society's involvement in mathematics contests. The Society currently sponsors and runs four competitions: the Canadian Open Mathematics Challenge (COMC), the Canadian Mathematical Olympiad (CMO), the Canadian Junior Mathematical Olympiad (CJMO) and the Canadian Mathematical Gray Jay Competition (CMGC). The MCC is also responsible for Canada's participation in the Asian Pacific Mathematics Olympiad (APMO), the European Girls Math Olympiad (EGMO) and the International

Mathematical Olympiad (IMO) with its training camps, and oversees the CMS National Math Camp.

Most of the work of the MCC is done by its four subcommittees (the COMC, CMO, EGMO and IMO Committees). Further information, including press releases, on most of the items in this report can be found through the [CMS Competitions web pages](#) and [media releases](#).

The MCC and (especially) its subcommittees have been very active this year, with a large number of deadlines throughout the calendar. Due to the COVID pandemic various adaptations had to be made and we thank all committee members for their efforts, enthusiasm and thoughtful consideration of changes that needed to be made. You have ensured that Canadian students could still participate in our competitions at all levels, from the Gray Jay to the CMO and the international contests. The CMS Executive Office also deserves our special gratitude for their dedication and support this year.

The European Girls Math Olympiad

The 9th European Girls Math Olympiad was held virtually in Egmond aan Zee, The Netherlands, April 15-21, 2020. The actual contest days were April 16 and 17 for us (countries could choose two out of the three days from April 16 till 18), with 4.5 hours to work on three problems each day, just as at the IMO. Each country participates with a team of up to four students. This was Canada's third year to participate. The students on the team were Anna Krokhine, *University of Toronto Schools, Toronto, ON*, Elaine Liu, *Appleby College, Oakville, ON*, Jennifer Wang, *University of Toronto Schools, Toronto, ON*, Amelie Zhou, *Marc Garneau C.I., Toronto, ON*. The leader was Dr. Dorette Pronk from Dalhousie University and the deputy leader was Diana Castañeda Santos from the University of Waterloo. We are extremely grateful to our principal sponsor, the Faculty of Mathematics at the University of Waterloo, for making this possible. The team members trained with potential IMO students at the winter training camp, early in January, and had a second training at the Fields Institute in February.

The Canadian team placed 30th out of 53 countries. The top three countries were Russia, Serbia and Romania, in that order. EGMO Math team Canada was awarded with a Silver Medal, a Bronze Medal and one Honourable Mention (for completely solved problems by a student who did not receive a medal). The Silver Medal was awarded to Jennifer Wang, the Bronze

Medal to Anna Krokhine and the Honourable Mention was awarded to Elaine Liu. The team's total score was 47 out of 252.



The Canadian Mathematical Olympiad

Seventy-seven students officially wrote the 51st eighty-three students from more than sixty different schools officially wrote the 52nd Canadian Mathematical Olympiad (CMO) on March 12, 2020. Most were invited on the basis of their performance in the most recent Canadian Open Mathematics Challenge or the CMO Qualifying Repêchage, a set of 8 problems posted online in the first half of February. Invited participants had just one week to submit solutions. The Repêchage was assembled by a group of volunteer experts, chaired by Lino Demasi, who was helped with the grading by Shawn Godin, Graeme Kemkes, and Mark Saaltink. A small number of additional invitations were made, in particular to winners of the Concours de l'Association mathématique du Québec and the Alberta High School Mathematics Competition. In addition, nine students wrote the CMO as unofficial participants, through a special agreement with ASDAN that gives Chinese students the opportunity to attempt the CMO.

The successful running of the contest is due largely to the efforts of the CMS Staff, particularly Sarah Watson, Gosia Skrobutan, and Alan Kelm. Thanks are also due to the members of the CMO Committee, who created and fine-tuned the problems, and graded the exams.

The top score this year was 32/35, the median score was 9/35.

The following students received prizes:

- **FIRST PRIZE and the CMO Cup:** Thomas Guo, Phillips Exeter Academy, Exeter, NH
- **SECOND PRIZE:** Zixiang Zhou, London Central Secondary School, London, ON
- **THIRD PRIZE:** Michael Li, Marc Garneau C.I., Toronto, ON;
- **HONOURABLE MENTIONS** were awarded to:
 - Andrew Dong, Centennial Collegiate Vocational Institute, Guelph, ON;
 - Arvin Sahami, Richmond Hill World School, Richmond Hill, ON;
 - Eric Shen, University of Toronto Schools, Toronto, ON;
 - Edgar Wang, Marianopolis College, Westmount, QC;
 - Kevin Wan, Marc Garneau C.I., Toronto, ON;
 - Daniel Yang, University of Toronto Schools, Toronto, ON

A full report of the 2020 CMO, including the question paper, solutions and analysis of the marking can be found at www.cms.math.ca/Competitions/CMO.

The Canadian Junior Mathematical Olympiad

In 2020 we introduced the Canadian Junior Mathematical Olympiad for top-scoring students in grade 10 or below who do not qualify for the CMO. This year nineteen students from seventeen different schools wrote the contest. The top score this year was 21/35, the median score was 10/35.

The 2020 CJMO Champion is Richard Zhang of Western Canada H.S., Calgary, AB. Honourable Mentions were won by:

- William Bate (Math Challenge at Western), London, ON;
- Jason Fang (Prince of Wales Secondary School), Vancouver, BC;
- George Wang (University of Toronto Schools), Toronto, ON;
- Haozhe Yang (Walter Murray Collegiate), Saskatoon, SK.

Further details regarding the CJMO are available through [CMS - Canadian Mathematical Olympiad | CMS-SMC](http://CMS-SMC).

The Asian Pacific Mathematics Olympiad

The 32nd Asian Pacific Mathematics Olympiad (APMO) was written on March 9, 2020 in North and

South America, and on March 10 in the Western Pacific and Asia, with Canada serving as the coordinating country. Of the twenty Canadian students who wrote the four-hour competition with five problems, ten were Canada's official participants.

- The top Canadian student was Thomas Guo (Phillips Exeter Academy), who was given a Gold Award.
- Silver Awards went to Michael Li (, Marc Garneau C.I.) and David Tang (University of Toronto Schools).
- Bronze Awards went to Edgar Wang (Marianopolis College, Westmount, QC), Eric Shen (University of Toronto Schools, Toronto, ON), Warren Er Bei (Sir William Osler Elementary School, Vancouver, BC), and Zixiang Zhou (London Central Secondary School, London, ON).
- Honourable Mentions went to Daniel Yang (University of Toronto Schools, Toronto, ON), Jiangxu Wan (University Hill Secondary School, Vancouver, BC), and Hyeonjik Son (A.Y. Jackson S.S., North York, ON).

Canada ranked 6th among 38 participating countries. Further details regarding the APMO are available through www.cms.math.ca/Competitions/APMO/.

International Mathematical Olympiad

The 61st International Mathematical Olympiad (IMO) had been scheduled to take place in St Petersburg in July 2020. Due to the COVID outbreak, it was rescheduled as a virtual competition, held September 19-28, 2020. The contest itself was held on September 21 and 22. The Team Leader was Alex Song from Citadel LLC and the Deputy Leader was Byung Chun from Royal St. George's College. The six high school students on the Canadian team were:

- Zixiang (Peter) Zhou, London Central Secondary School, London, ON
- Thomas Guo, Phillips Exeter Academy (Exeter, NH)
- Michael Li, Marc Garneau C.I., Toronto, ON
- Edgar Wang, Marianopolis College, Westmount, QC
- David Tang, University of Toronto Schools, Toronto, ON
- Eric Shen, University of Toronto Schools, Toronto, ON

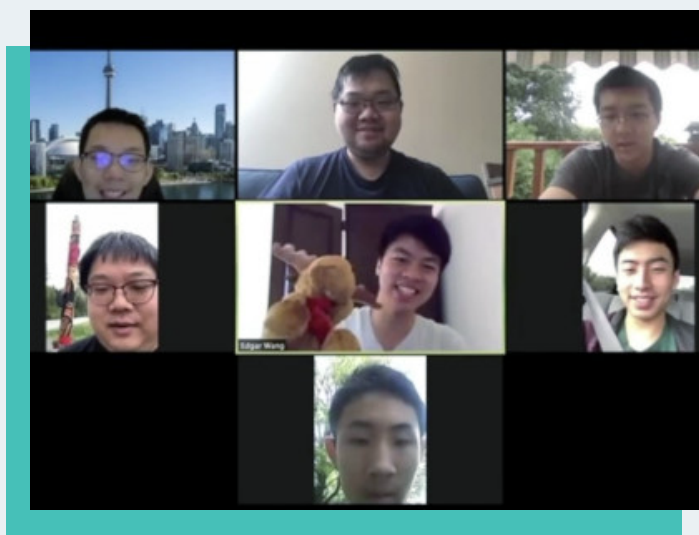
The students were asked to write the exam at a designated testing site. Most of our team wrote in Toronto under the supervision of Ed Barbeau and Dani Spivak. Edgar Wang, who had already started college in the US, wrote the test at the Boston testing site.

The Canadian team placed 12th out of 105 countries. The top three countries were China, Russia and the United States of America, in that order. Math team Canada was awarded with three golds, one silver and two bronze medals. The Gold Medals were awarded to Thomas Guo, Michael Li and Eric Shen, the Silver Medal was awarded to Zixian Zhou, and the Bronze Medals were awarded to David Tang and Edgar Wang. The team's total score was 161 out of 252.

The team trained this year virtually throughout the summer with training provided by the leader, Alex Song, and Victor Rong, a member of Math Team Canada to the IMOs from 2017 till 2019.

The CMS's Media Releases on the 2020 IMO can be found at [Six top mathletes selected for Math Team Canada 2020 | CMS-SMC](#) and [All Members of Math Team Canada Win Medals at the 2020 IMO | CMS-SMC](#). There is also a report on the 2020 IMO, written by the team leader in the CMS Notes, [2020 IMO Report - CMS Notes](#).

The **IMO Winter Training Camp** was hosted by York University, January 8-12, 2020, and was attended by



sixteen high school students (eleven male and five female) from across Canada. The local organizer was Neal Madras, assisted by Hongmei Zhu, Norman Purzitsky, Ann-Marie Carless, and the staff in the Office of the Master of Bethune College at York University. The program of the camp was organized by the IMO Team Leader Alex Song with assistance from Byun Chun (IMO Deputy Leader), Dorette Pronk (EGMO Team Leader), and additional trainers Mike Pawliuk, Howard Halim, Dani Spivak, Jacob Tsimmerman and Victor Rong.

CMS Canada Math Camp

The Canada Math Camp is designed primarily for younger Canadian students with at least two years remaining in high school (grades 8-10) and with the potential to compete at the Mathematical Olympiad level. Participation in this camp is by invitation only. Students are charged a registration fee of \$500 (plus tax) each.

The 2020 CMS Canada Math Camp took place online, organized by Teresa Gong from the University of Toronto and the dates were July 6-10. The instructor was Malors Espinosa, PhD candidate and former Math Olympian for Mexico. Twenty-five students attended the camp (six female, nineteen male). Seventeen were from Ontario, six from British Columbia, one from Nova Scotia and one from the United States. The selection process was based predominantly on the results of the COMC with some being invited based on scores in the Waterloo competitions and some on a referral basis. The camp was held online and involved 20 hours of class time and 4 office hours. All of the students found that the camp had increased their interest in this field of study, and 90% of them found that the camp increased their curiosity to learn more about the topics.

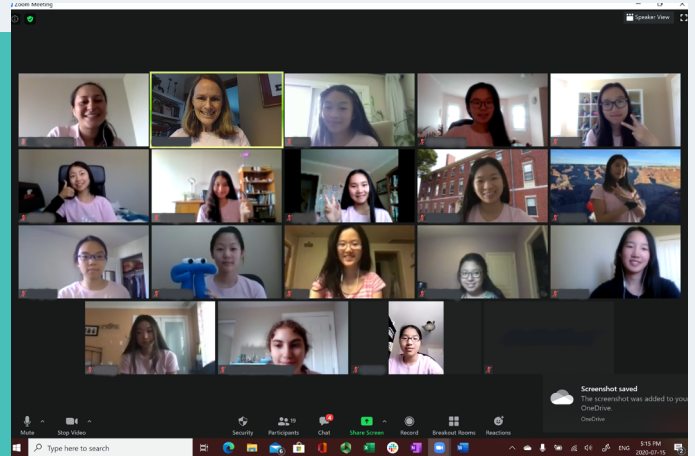


See the Education Committee report for information about other Math Camp activities.

EGMO Summer Training Camp

In 2020 we had our first summer training camp for girls to prepare for EGMO. The camp dates were: July 13-17. This camp is aimed at girls who have scored well on the COMC or other equivalent contests and provides them with a week of training on topics that typically covered on an EGMO contest. This camp proved to be a wonderful time for students to meet and instructors

from various Canadian universities, as well as IMO and EGMO alumni. There were lectures in the mornings and problem-solving tutorials in the afternoons. In between sessions students worked together in small groups in Zoom breakout rooms. The students also enjoyed solving an online escape room puzzle. The camp was attended by the camp instructors were: Elnaz Hessami



Pilehrood, Ildiko Pelczer, Anne Dranowski, Qi Qi, Matilde Lalin, Mike Pawliuk and Yuliya Nesterova. We also organized a Women on Math discussion panel with panelists Matilde Lalin, Victoria Krakovna, Anne Dranowski, Elnaz Hessami Pilehrood and Melody Guan.

The Cyberspace Math Competition

Since IMO 2020 had to be moved to September, a number of the organizers of the IMO and EGMO competitions decided to organize an alternate invitational competition during the summer. They used the Art of Problem Solving platform to organize the Cyberspace Mathematical Competition. Students wrote the contest from home. Marking and coordination were done online via AoPS. The Canadian marking team consisted of James Rickards, Matthew Brennan and Victor Rong. The contest was held over two days over the period of July 12-14, with four essay-style problems each day. Each participating country was invited to send a team of up to eight students including at least two female students. The Canadian team consisted of:

- Edgar Wang, Marianopolis College, Westmount, QC
- Eric Shen, University of Toronto Schools, Toronto, ON
- David Tang, University of Toronto Schools, Toronto, ON
- Jennifer Wang, University of Toronto Schools, Toronto, ON
- Yijia (Laura) Li, St. Clement's School, Toronto, ON

- Michael Li, Marc Garneau C.I., Toronto, ON
- Thomas Guo, Phillips Exeter Academy (Exeter, NH)
- Zixiang (Peter) Zhou, London Central Secondary School, London, ON

The Canadian team earned in total 286 out of 448 points, placing us 9th among 75 participating countries. The three top-scoring countries were Russia, the United States and Korea. The Canadian team was awarded with five Gold Medals, one Silver Medal, and one Bronze Medal. Michael Li, Thomas Guo, David Tang, Zixiang Zhou, and Eric Shen received Gold Medals; Edgar Wang received a Silver Medal; and Jennifer Wang received a Bronze Medal.

Further details are available on [Cyberspace Mathematical Competition](#).

The Canadian Mathematical Gray Jay Competition

Our second new competition this year, to celebrate



the 75th birthday of the CMS, was the Canadian Mathematical Gray Jay Competition. This contest is based on the math curriculum from grades 5 to 8 and is open to students in grades K-8. Due to the pandemic situation, the Gray Jay was offered in two formats: paper and online. The contest was popular both in Canada and abroad: 108 students wrote it through ASDAN in China, and 236 students wrote it through the Thai-Canadian Alumni Association in Thailand.

There were 24 perfect papers, 16 in Canada and 8 international, and the quartile scores were 52, 37 and 24 out of 80.

The winners are selected in two categories: Canadian and International. We list here the Gold Awards in both categories.

Canadian Students

Gold Award

- Ansh Agarwal, Competitive Kids STEM Projects, Brampton, ON
- Patrick Bian, TTMATH School, Markham, ON
- Elliott Chen, Rootofmath Academy, Surrey, BC
- Perry Dai, University of Toronto School, Toronto, ON
- Wei Miao Fu, Math House Academy, Richmond, BC

- Anton Lazarchyk, Olympiads School, North York, ON
- Nicholas Ng, TTMATH School, Markham, ON
- Eric Ning, Olympiads School, North York, ON
- Michael Qu, Cedarview Middle School, Nepean, ON
- Mark Raspopov, University of Toronto School, Toronto, ON
- Jingchun Ethan Su, Countrise Education, LaSalle, ON
- Yuying Wang, TTMATH School, Markham, ON
- Michael Wu, The Renert School, Calgary, AB
- Henry Zhang, Ivy Path School, Toronto, ON
- Jeremy Zhang, Triway Education, Richmond Hill, ON
- Daniel Zhou, Vancouver Olympiad School Inc., Vancouver, BC

International Students

Gold Award

- Angel Antonov Hristov, High School of Math and Sciences Acad. Nikola Obreshkov, Bulgaria
- Yaoyi Jiang, ASDAN China, China
- Jiayin Miao, ASDAN China, China
- Prima Pipatnarapong, Thai-Canadian Alumni Association, Thailand
- Kittipat Pongarunotai, Thai-Canadian Alumni Association, Thailand
- Sanjana Ramesh, ICAE, United States
- Peerawat Suphanrungsirisi, Thai-Canadian Alumni Association, Thailand
- Kornchawan Tantivisetthak, Thai-Canadian Alumni Association, Thailand

Further information can be found on the website, [Canadian Mathematical Gray Jay Competition \(CMGC\)](#), and in the media release, [The First Canadian Mathematical Gray Jay Competition Was a Huge Success! | CMS-SMC](#).

The Canadian Open Mathematics Challenge



The 25th writing of the COMC, the third sponsored by the Casualty Actuarial Society and the Society of Actuaries, took place on October 29, 2020. The contest was again supported by a partnership of universities from across Canada. This was our first national contest to be held under pandemic conditions. We are very grateful for the efforts of the CMS office staff to set in place the

possibility of online administration of the contest to respond to the pandemic threat. There were, of course, concerns about security, but a reasonable solution with remote supervision was found. Comparison of results from online and in school writing did not produce evidence of cheating for the COMC marked in Canada.

The CMS extends a special note of thanks and appreciation to all the volunteers, at several locations across the country, who helped to mark the competition papers. This was our fourth year working with Crowdmark (which was essential to marking during a pandemic). The earlier contest date and the addition of further marking centres, including a francophone centre in Quebec, meant that we were able to complete the first round of marking in time this year. The validation round went smoothly with the panel of people, many from the group who prepared the problems. This provided them with information about how students handled their creations.

This was the third year that we partnered with ASDAN to make the exam available to a much larger contingent of students in China.

The competition questions were developed by the 2020 Problem Committee which consisted of Margo Kondratieva (chair), Lino Demasi, Shawn Godin, John Irving, Yuliya Nesterova, James Rickards, Alex Song, and Zack Wolske. We thank them for all their hard work and welcome the new members to the committee.

We are grateful to the Casualty Actuarial Society and the Society of Actuaries for their commitment to sponsor our competitions for the coming year as well.

The COMC has several purposes. First and foremost, it aims to encourage students in their exploration of mathematics and problem solving. Second, the COMC provides an enrichment activity for teachers to use with their students during the fall term. Third, the COMC is used by the CMS to identify students who will write the Canadian Mathematical Olympiad and who will attend, among other events, the Winter Training Seminar and the Canada Math Camp. It is also used in the team selection for Canada's EGMO team.

The 2020 COMC had 8822 students participating (4886 in Canada and 3936 elsewhere, of which 1665 wrote with ASDAN in China and 188 in Thailand). This means that our numbers in Canada were a bit down, due to the pandemic, but our international numbers showed a significant increase. There were two perfect papers this

year: one in Canada and one in Indonesia. The quartiles divided this year at the scores of 22, 33 and 44 points out of 80.

This was the first year of our inclusiveness initiative to invite black and indigenous students to participate for free. As a result, four new schools participated: two in Nova Scotia, one in Manitoba and one in Ontario.

As in previous years, the top awards in the 2020 COMC were given in two categories.

The first category this year is Canadian-schooled students and Canadian citizens/PR-card holders at schools outside Canada. The top competitors in this category were:

Gold Award:

Yiu Him Chung, Seaquam S.S., Delta, BC

Silver Awards:

- Kevin Min, TTMATH School, Markham, ON
- Jiangxu (Justin) Wang, University Hill S.S., Vancouver, BC
- Bronze Awards: Michael Hahn, University Hill S.S., Vancouver, BC
- Zhening Li, University of Toronto Schools, Toronto, ON
- Andrew Wen, Phillips Academy, United States

Honour Roll:

- Warren Er Bei, Homeschool, Vancouver, BC
- Tiger Che, SpringLight Education Institute, United States
- Thomas Frith, Abbey Park H.S., Oakville, ON
- Antoine Labelle, Collège de Maisonneuve, Montréal, QC
- William Szeto, University of Toronto Schools, Toronto, ON

In addition, hundreds of awards at the provincial level and at various regional and grade levels were made, and gift certificates were given out through random draws. A number of prizes were also awarded to teachers in appreciation of their participation in the 2020 COMC.

In the International category the top competitors were:

Gold Award:

Stanve Avriilium Widjaja, Simetri, Indonesia

Silver Award:

Nikola Kolarov, High School of Math and Sciences Acad. Nikola Obreshkov, Bulgaria

Bronze Award:

Sanjana Das, SpringLight Education Institute, United States

Honour Roll:

- Tianyang Huang, Shanghai Foreign Language School, China
- Natchanon Mongkoltananont, Thai-Canadian Alumni Association, Thailand
- Worrawat Rungaramsin, Thai-Canadian Alumni Association, Thailand
- Sitta Tantikul, Thai-Canadian Alumni Association, Thailand
- Filbert Ephraim Wu, Math Trainers Guild of Philippines, Philippines

Further details are available at www.cms.math.ca/Competitions/COMC/.

Nominating Committee

Chair: Alexandre Girouard (Laval)

The CMS Nominating Committee actively solicits and recruits individuals with an interest in volunteering with the CMS, in support of the Canadian mathematics community. The Nominating Committee ensures that the Executive and Board receive all necessary nominations required to fill vacancies in CMS standing committees, and also that a slate of nominations is received for Executive and Board elections. It also periodically reviews the terms of reference for all CMS standing committees.

During 2020, 165 individuals contributed to the work of the CMS, either by election or by serving on one or more of the CMS's standing committees, subcommittees or editorial boards. In 2020 there were 54 appointments to committees, subcommittees, or editorial boards that took effect, including 29 appointments to standing committees.

Two new standing committees were created in 2020: the Reconciliation in Mathematics Committee and the Equity, Diversity and Inclusiveness Committee.

Publications Committee

Chair: Matthias Neufang (Carleton)

The Publications Committee was working on a variety of areas in 2020. The Committee made a number of appointments to editorial boards of the Society's publications, namely:

- ten appointments to the CJM/CMB Editorial Board;
- five appointments to the Crux Mathematicorum Editorial Board;
- one appointment to the CMS Notes Editorial Board.

Moreover, there has been discussion regarding the continuation of the Society's publishing agreement with Cambridge University Press beyond its current duration. Different models will be explored. Furthermore, the Publications Committee has been considering the creation of a new journal for longer research papers, which would complement the Canadian Journal of Mathematics (CJM) and the Canadian Mathematical Bulletin (CMB). There appears to be demand for a journal specializing in longer research papers. A detailed proposal will be prepared.

The CMS publishes annual volumes of two peer-reviewed research journals as well as educational publications; in 2020, the CMS published the following:

- Canadian Journal of Mathematics (Volume 72);
- Canadian Mathematical Bulletin (Volume 63);
- Crux Mathematicorum (Volume 46);
- CMS Notes (Volume 52).

On other issues, a new edition of the publication *Moreover*, the CMS/CAIMS Books in Mathematics Series is published in cooperation jointly with the CMS and the Canadian Applied and Industrial Mathematics Society (CAIMS). This new series, with several volumes already in the works, replaces the CMS Books in Mathematics Series, which successfully published 45 volumes since 2000.

Reconciliation in Mathematics Committee

Chair: Keith Taylor (Dalhousie)

The Terms of Reference for this committee state: The Reconciliation in Mathematics

Committee (RMC) is responsible for (i) coordinating the contributions of the mathematical community to the reconciliation process, and for (ii) devising a strategy to eliminate educational and employment gaps in mathematics between Indigenous and non-Indigenous Canadians.

The Nominations Committee established the following membership of the RMC: Keith Taylor (Chair), Melania Alvarez, Shawn Desaulniers, Edward Doolittle, Lisa Lunney Borden, Matilde Lalin (President's designate), and Joseph Khoury (Education Committee Representative). The Terms of Reference call for six



regular members in addition to the Chair, so there remain two vacancies.

Due to travel and meeting restrictions, the committee was not able to have an in-person meeting after being formed. A two-hour virtual meeting was held on November 30, 2020. It was decided that one of the vacancies on the committee should be led by an Elder who had an interest in the mandate of the RMC. Several names were proposed of Elders known by members of the committee and a short list was created. Following the meeting, one of the members began the process of discussing the prospect with the first Elder on our list. We also agreed to ask that the fee for membership in the CMS be waived for an Elder who agrees to serve and who is approved through the nomination process. We also developed suggestions for someone appropriate for the final vacancy of the committee.

We decided on a adhoc committee to organize a small session on issues of Indigenous engagement with mathematics at the 2021 Summer Meeting.

An extended list of topics was formulated for development in 2021.

Research Committee

Chair: Kai Behrend (UBC)

The CMS Research Committee oversees the research activities of the Society. The Committee helps with selecting the scientific organizers for the summer and winter meetings, it participates in the scientific organization of these meetings, and it advises the Executive Committee on research-related issues.

The Research Committee adjudicates the research-related prizes awarded by the Society. The Coxeter-

James Prize, recognizing young mathematicians who have made outstanding contributions to mathematical research, was awarded this year to Jacopo De Simoi of the University of Toronto, for his work in the area of dynamical systems. He works on some of the most challenging problems in dynamics and has made profound contributions to Hamiltonian systems, Fermi acceleration, hyperbolic billiards, slow-fast systems and nearly integrable systems. He presented his prize lecture at the 2020 CMS Winter Meeting hosted by McGill University.

The Krieger-Nelson Prize, recognizing outstanding research by a female mathematician, was awarded to Sujatha Ramdorai of the University of British Columbia, for her work that covers a broad range of subjects, including motives, K -theory and arithmetic geometry.

The Jeffery-Williams Prize, recognizing mathematicians who have made outstanding and sustained contributions to mathematical research, was awarded to Juncheng Wei of the University of British Columbia, for his exceptional contributions to the theoretical development and interdisciplinary applications of nonlinear partial differential equations.

The Research Committee also appoints the members of the Doctoral Prize Selection Committee. The CMS Doctoral Prize, recognizing outstanding performance by a doctoral student, was awarded to Duncan Dauvergne, who received his PhD under the supervision of Bálint Virág at the University of Toronto in the field of probability. He delivered his prize lecture at the 2020 CMS Winter Meeting. Starting in 2021, this prize is renamed the CMS Blair Spearman Doctoral Prize thanks to the generous donation provided to CMS by the Spearman Family.

We were particularly proud this year to put out a call for nominations for a new CMS research award. The prize is named in honour of Cathleen Synge Morawetz (1923-2017), to reflect the remarkable breadth and influence of her research achievements in pure and applied mathematics. The prize will be awarded every year to the author or authors of an outstanding research publication. The research area the prize is awarded in rotates on a 6-year cycle. The first prize will be awarded in Geometry and Topology. The call for nominations for the inaugural prize 2021 went out this year, and the Research Committee received many high caliber nominations. The winner(s) will be announced in early 2021.

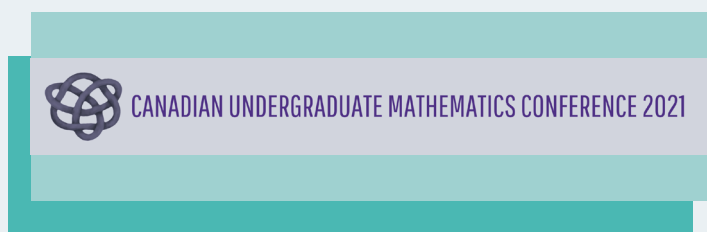
The International Mathematical Union sought advice from the CMS on potential speakers from the Canadian mathematical community at the International Congress of Mathematicians 2022 in St. Petersburg. In response, the Research Committee, in conjunction with the International Affairs Committee, assembled a list of eminent Canadian researchers that we hope would excellently represent us at the ICM.

The 2020 Summer Meeting of the CMS was postponed by a year, due to the Covid-19 epidemic. The CMS Winter Meeting was hosted by McGill University and was held entirely online. It was nevertheless a great success. There were 31 scientific sessions, 6 plenary lectures, and over 700 participants. The CMS Winter Meeting hosted the first annual Mitacs Innovation Lecture, by Alicia Carrquiry of Iowa State University, titled, "Statistics, Mathematics, and the Fair Evaluation of Evidence."

Student Committee

Co-chairs: Sébastien Lord (Ottawa) and William Verreault (Laval)

Canadian Undergraduate Mathematics Conference (CUMC)



Amid the ongoing global pandemic, the Student Committee is proud to say that the Canadian Undergraduate Mathematics Conference (CUMC)

remained a success and was held online in August 2020. The CUMC local organizing committee, composed of students from Western University and led by CUMC President Amar Venga, quickly adapted to the requirements of going online and delivered an excellent mathematical experience to over 100 registrants from around the country and beyond. More than 40 students gave talks at this conference, representing 22 universities and four countries. The Student Committee and local organizing committee would also like to thank the 12 keynote speakers and industry panelists.

Student Activities at the 2020 CMS Winter Meeting

The Student Committee organized multiple student-oriented events during the 2020 CMS Winter Meeting held online in December. This included the first student focused mini-course, which was given by three keynote speakers on the topic of mathematical communication to about 20 students. Student research was also featured with 10 students giving talks on their work and nine more presenting posters. Finally, a virtual social event with math-themed parlour games was attended by about a dozen students.

Upcoming New Activity: An online student talk series.

In looking to adapt to an increasingly online world of academia, the Student Committee began preparations to launch an online student talk series in early 2021. The Committee also hopes that this monthly event by and for students will help promote the Committee and the CMS to students on a more frequent and regular basis.

Change in Membership

Over the late summer and early fall, the Student Committee welcomed three new members and thanked those whose terms had ended. Notably, we extend our deepest gratitude to Yuliya Nesterova who completed her term as co-chair and welcomed William Verreault for a two-year term in this position.

Grants

Through the Society's Competitions and Endowment Grants Programs, the CMS funds projects that promote the discovery, learning and application of mathematics in Canada. Due to the COVID-19 pandemic, grants were not granted in 2020 since many of the activities set to take place in 2020 were cancelled and deferred to 2021 and/or 2022. The following activities that were awarded grants in 2020 took place:

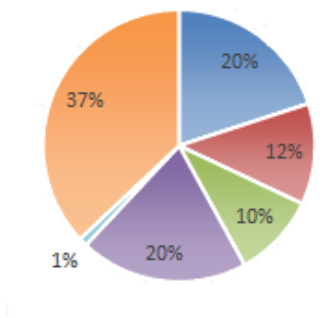
Endowment Grants

- Fraser Valley Math Education Sq'ep (University of the Fraser Valley)
- Outreach to Schools Initiative (University of Toronto)
- Création d'ateliers paradoxaux et présentations dans les écoles secondaires (Université Laval)
- Septième Semaine des maths, ateliers, spectacles et formations (Université Laval)

Provincial Competition Grants

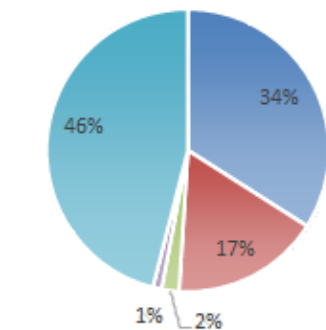
- Alberta High School Math Competition
- AQJM-Université Laval
- Canadian Math Challengers Competition
- Caribou Cup

Financial Overview



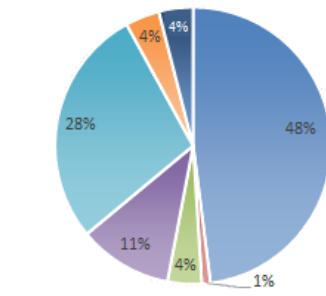
Revenue \$1,425,047

- Registration fees, other sales
- Membership fees
- Grants
- Other
- Services, advertising and sales
- Subscriptions and publications



Expenses \$940,661

- Learning
- Discovery
- Operations
- Other
- Advancement



Invested Funds \$2,726,042

- Legacy
- Operations
- Olympiads
- Endowment
- Spearman Doctoral Prize
- Borwein Distinguished Career
- House of Mathematics

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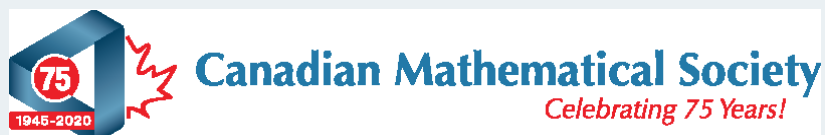
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For more information about the CMS, please contact:

Dr. Termeh Kousha

Executive Director
Canadian Mathematical Society
tkousha@cms.math.ca

Denise Charron

Manager, Member Relations
Canadian Mathematical Society
mpagent@cms.math.ca