

Canadian Mathematical Society

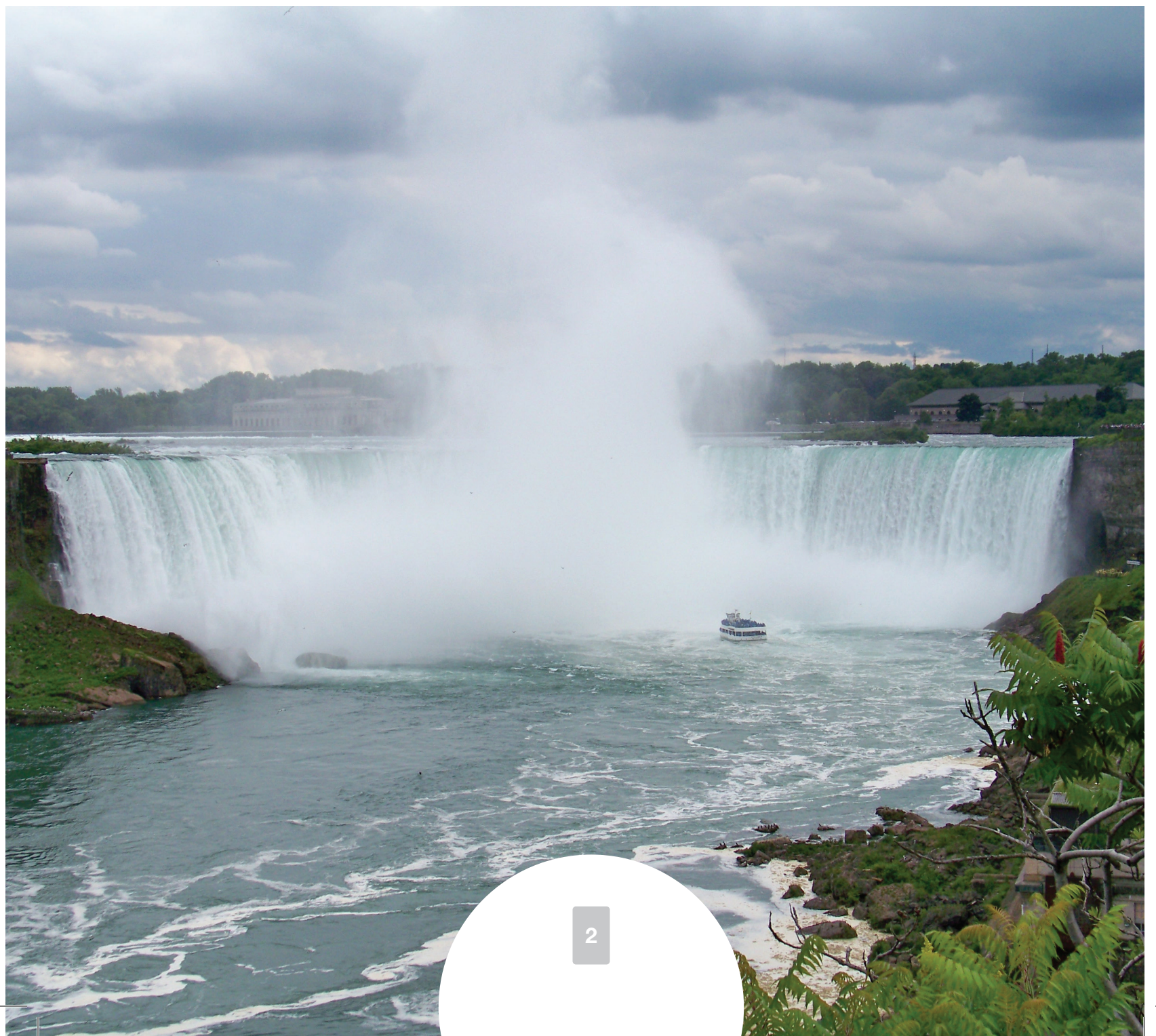
Annual Report

2016



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as of Dec. 31, 2016

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President's Report

In the summer of 2017, the breadth of mathematical achievement in Canada will be on display for all to see. From July 24th to 28th, the Canadian Mathematical Society (CMS) plays host to the second Mathematical Congress of the Americas (MCA), in Montreal (joint with our annual CMS summer meeting). This highly anticipated meeting of mathematicians and students from across North, Central and South America, and the Caribbean is the largest meeting to be held in Canada since the International Congress of Mathematicians in Vancouver in 1974. It features a truly first-rate collection of speakers, including plenary lectures by Manuel del Piño, Shafira Goldwasser, Peter Ozsvath, Yuval Peres and Kannan Soundararajan, and public lectures by Eric Demaine and Étienne Ghys.

Immediately preceding this congress, the International Mathematical Olympiad takes place in Rio de Janeiro, Brazil, featuring teams of talented high school mathematicians from more than one hundred countries around the world. One year after the CMS-sponsored Canadian team completed their sixth straight top twelve finish, featuring both the youngest gold medalist and the highest scoring female in the Olympiad, hopes are even higher this time around.

At the same time that Canada is showcasing our successes in mathematics, a confluence of political events in North America and Europe has presented us with unprecedented possibilities for recruitment and expansion of the Canadian mathematical community at the undergraduate, graduate, postdoctoral and professorial levels. Applications from international students, both undergraduate and graduate, have risen across the country, a trend that shows no sign of abating; which begs the question: can we capitalize on these opportunities and deal with the corresponding challenges? While much of the onus to do so will undoubtedly rely upon quick and flexible thinking from administrators at individual universities and colleges, they will need to depend on financial backing from provincial authorities. Additionally, there remains an urgent need for federal government support as well.

With the current political climate, there are reasons to believe that such support might even be forthcoming. This is where the CMS can make a difference. Our membership is national, highly engaged and representative of a broad cross-section of Canadian mathematics, while our permanent staff is based in Ottawa, ideally positioned to connect with the federal government.

The past year saw continued personnel change at the CMS executive office, ably managed by our excellent staff, overseen by Executive Secretary Graham Wright. A very successful fundraising initiative was carried out by our fundraising consultants Gerri Jensen and David Rodgers. The ongoing adoption of a new IT system has presented us with numerous challenges, but smooth sailing is hopefully coming in the near future. Our publishing office under Michael Doob and Craig Platt, together with our Editors in Chief, Luigi Addario-Berry and Eyal Goren (Canadian Journal of Mathematics), Jie Xiao and Xiaoqiang Zhao (Canadian Mathematical Bulletin), and Kseniya Garaschuk (Crux Mathematicorum) helped maintain the reputation of the CMS for excellence in publications. Outreach and educational activities continued unabated, with more than a dozen CMS-sponsored Math Camps and the highly-successful Canadian Open Math Challenge (COMC) and Canadian Mathematical Olympiad (CMO). The wide range of activities supported by the CMS to promote the advancement of Canadian mathematics at all levels is only possible due to the continued efforts of volunteers. I thank you all.

The CMS held two meetings in 2016, a Summer Meeting in Edmonton and a Winter Meeting in Niagara Falls. Both were well-attended and featured excellent speakers and scientific programs. The CMS would like to thank CRM, PIMS, Fields and AARMS for their generous support for both meetings. A very special thanks should go to the scientific directors, session speakers, local organizers, staff and volunteers for making these meetings such a central part of Canadian mathematics. The Canadian Mathematical Society is Canada's voice in Mathematics. Contributions from members allow the CMS to promote the application of math in Canadian industry; to support math outreach; and to help support math enrichment programs.

In 2016 there was a 6% increase in membership from 2015. The retired member category has increase by 9% and continues to increase each year, however, our highest regular category (salaries over \$100K) decreased by 9%. Student membership (including institutionally sponsored student memberships) increased by 8%.

As I reach the half-way point of my term as President, I would like to express my sincere thanks to the outgoing Vice Presidents Chantal David, Florin Diacu, Rahim Moosa, David Pike, and Raj Srinivasan, as well as the Past President Lia Bronsard for their hard work and exceptional support, particularly during my sabbatical and resulting time as President-in-absentia. I and the entire CMS community additionally owe a tremendous debt of gratitude to Graham Wright who is proving to be not only figuratively but also literally irreplaceable.

Michael Bennett (UBC)

Prizes and Awards

Jeffery–Williams Prize

Daniel Wise (McGill)



The Jeffery-Williams Prize recognizes mathematicians who have made outstanding contributions to mathematical research. In 2016, the Jeffery-Williams Prize was awarded to Professor Daniel Wise (McGill). Wise is widely recognized as one of the top geometric group theorists in the world and the best of his generation.

His work has not only had a profound impact on the immediate subject of geometric group theory, but also played a key role in the solution of outstanding open problems in the theory of 3-manifolds.

Photo Credit: Yael Halevi-Wise

Krieger–Nelson Prize

Malabika Pramanik (UBC)

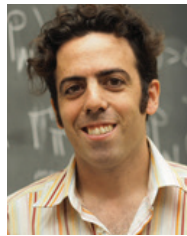


The Krieger-Nelson Prize was inaugurated to recognize outstanding research by a female mathematician. In 2016, the prize was awarded to Malabika Pramanik. Pramanik uses analytical tools to answer questions about pattern identification in sparse sets; that is, in finding regular structures within sets that are otherwise very disordered and thin.

Pramanik was born in India, and obtained her bachelor's and master's degree in statistics from the Indian Statistical Institute. She got her Ph.D. in mathematics from University of California at Berkeley in 2001. Prior to joining the University of British Columbia in 2006, she held positions as a Van Vleck Visiting Assistant Professor at the University of Wisconsin, Madison, and a Fairchild Senior Research Fellow at the California Institute of Technology, Pasadena. She received the US Junior Oberwolfach Fellowship in 2005, and was funded twice by the NSF before joining UBC. She has held visiting positions at University of Rochester, the Indian Institute of Science, and Beijing Normal University, and was the winner of the 2015-2016 Ruth I. Michler Memorial Prize. Pramanik is an editor for the Transactions and Memoirs of the American Mathematical Society, and editor of the Proceedings of the Edinburgh Mathematical Society.

Coxeter–James Prize

Louigi Addario-Berry (McGill)



The Coxeter-James Prize was inaugurated to recognize young mathematicians who have made outstanding contributions to mathematical research. In 2016, Associate Professor Louigi Addario-Berry was the recipient. Addario-Berry works on the interface of probability and combinatorics, and “has emerged as one of the leaders

of his generation in the area of discrete probability” one referee said.

A challenging and exciting area of investigation in probability and statistical physics is to mathematically define and study random energy landscapes. As in the case of a river system, an extraordinarily large number of these models turn out to have an underlying branching structure. One of the aims of Addario-Berry's research is to investigate the structure and scaling limits of typical and exceptional paths in probabilistic discrete models and in their scaling limits, and in particular in systems containing a phase transition or exhibiting some form of tree-like behaviour.

Photo Credit: Jonathan Mattingly

Doctoral Prize

Vincent Genest (Massachusetts Institute of Technology)



The Doctoral Prize recognizes outstanding performance by a doctoral student who has graduated from a Canadian University. In 2016 the CMS recognized Vincent X. Genest. Dr. Genest's doctoral thesis, Algebraic structures, superintegrable systems and orthogonal polynomials, is comprised of twenty-three research

papers and five conference proceedings written in collaboration with other mathematicians and physicists, most of which have been published in top-tier journals including four in Communications in Mathematical Physics, two in Letters in Mathematical Physics, and one in Proceedings of the American Mathematical Society.

“The theme of Vincent's research concerns the rich interplay between exactly solvable quantum mechanical problems, symmetries, orthogonal polynomials and the algebraic structures that underlie the links between these themes,” said Niky Kamran (McGill University) in his nomination letter for Dr. Genest. “This amazing thesis reflects his deep commitment to research and the boundless energy that he brings to his work, but what is equally remarkable is the diversity of techniques and perspectives that appear in his research.”

Adrien Pouliot Award

Donald Violette (Moncton)



The Adrien Pouliot Award recognizes individuals who have made significant and sustained contributions to mathematics education in Canada. In 2016, Donald Violette (Moncton) was the recipient for his excellence in teaching and contributions to mathematics education in Canada, particularly in his home province of New Brunswick.

For over 25 years, Violette has played an active and leading role in the promotion, teaching, recognition and appreciation of mathematics in his community and home province of New Brunswick. His reputation as an exceptional teacher has flourished since the beginning of his teaching career at the age of twenty-three.

Violette's incredible energy and passion have allowed him to work towards demystifying the subject of mathematics for students and the general public. Outside of teaching mathematics at the post-secondary level, Violette has kept busy with outreach activities, from conducting over 450 workshops benefiting nearly 17,000 students at local high schools to initiating new programs and math competitions, which include concours de mathématiques de Poincaré, concours de mathématiques de Möbius and concours de mathématiques de Sierpinski.

He is also the founder and organizer of many math camps in New Brunswick, including camps mathématiques de l'Acadie, camp Séjour vacances : à la découverte des mathématiques and camp Les mathématiques, c'est magique. In 2014, Violette established the first mathematical foundation in Canada, Fondation Mathématique Donald Violette Inc., a non-profit organisation with the main objective of supporting math outreach activities.

Excellence in Teaching Award

Ian VanderBurgh (Waterloo)



The Excellence in Teaching award was inaugurated to recognize sustained and distinguished contributions in teaching at the post-secondary undergraduate level at a Canadian Institution.

In 2016 Lecturer Ian VanderBurgh (Waterloo) was the recipient. VanderBurgh's teaching has addressed diverse audiences, from struggling calculus students to Putnam students. His work has had a significant influence on the mathematical community among both students and teachers at large.

Within the University of Waterloo's Faculty of Mathematics, VanderBurgh has earned enormous respect from faculty and students alike. His reputation and popularity are legendary

and the influence he has had on students and teachers will endure. VanderBurgh understands students' needs and knows where and when they will have difficulties with the material. He carefully prepares and presents material in a way that is easy to understand, with motivating examples and insightful observations.

Presenting problem-solving workshops in countless elementary and secondary schools across Canada and abroad, VanderBurgh's deep commitment and dedication to teaching and to students extends well beyond the classroom. He has assisted with the coaching of the Waterloo Putnam team and participated in developing and administering three University of Waterloo undergraduate math contests. As the Director of the Centre for Education in Mathematics and Computing (CEMC) since 2005, VanderBurgh has led numerous initiatives to promote mathematics including contests, high school visits, student and teacher workshops, and online resources. Under VanderBurgh's leadership, the CEMC received the 2014 NSERC Award for Science Promotion.

G de B Robinson Award

Jim Agler (University of California, San Diego) and
John E. McCarthy (Washington University, St. Louis)



The G. de B. Robinson Award is given out to recognize outstanding contributions to the Canadian Journal of Mathematics (CJM) and the Canadian Mathematical Bulletin (CMB). In 2016 Jim Agler (California) and John E. McCarthy (Washington University, St. Louis) were recognized for their paper "Global Holomorphic Functions in Several Noncommuting Variables" (Canadian Journal of Mathematics Vol. 67:2 [2015] pp. 241-285).



Agler and McCarthy's paper is a fundamental contribution to free analysis, a rapidly developing area of modern mathematics which studies function theory in free noncommutative variables.

Both Agler and McCarthy are well-known specialists in multivariate complex analysis and operator theory. The selection committee, chaired by CJM Editors-in-Chief Henry Kim and Robert McCann, noted that the prize-winning article, "Without doubt is one of the most influential papers in the area. The article's nomination for the Robinson Prize was enthusiastically supported by the CMS Editorial Board due to its novelty, originality and introduction of important techniques leading to pioneering results."

Both Agler and McCarthy have authored over 75 articles, approximately two dozen of which they have co-authored together. They are also the authors of the book Pick Interpolation and Hilbert Function Spaces (AMS, 2002).

Committee Reports

Research Committee

The CMS Research Committee oversees the research activities of the Society. This includes helping to select the scientific organizers for the summer and winter meetings, participating in the scientific organization of these meetings, playing a major role in the selection of winners for research-related prizes, and advising the Executive Committee on research related issues.

The Research Committee adjudicates a number of awards and prizes. The Coxeter-James Prize, recognizing a young mathematician who has made outstanding contributions to mathematical research, was awarded to Louigi Addario-Berry (McGill University). The Jeffery-Williams Prize, recognizing a mathematician who has made outstanding contributions to mathematical research, was awarded to Daniel Wise (McGill University). The Krieger-Nelson Prize, recognizing outstanding research by a female mathematician, was awarded to Malabika Pramanik (University of British Columbia). The Research Committee also appoints the members of the Doctoral Prize Selection Committee (one of whom must be a member of the Research Committee). The Doctoral Prize, recognizing outstanding performance by a doctoral student, was awarded to Vincent Genest (Ph.D. Université de Montréal, 2015) for his thesis supervised by Luc Vinet.

With the support of PIMS, Fields, CRM, and AARMS, the CMS semi-annual national meetings attracted 654 participants. Together, the meetings presented 2 public lectures, 11 plenary lectures, and 44 scientific sessions, encompassing 529 talks.

Ailana Fraser (UBC) Chair

2016 CMS Summer Meeting

June 24 - 27, 2016, Host: University of Alberta Edmonton, AB

The 2016 Summer Meeting was held in Edmonton, Alberta and included one Public Lecture, five Plenary Lectures and 17 scientific sessions.

The Awards Banquet was held on June 25th at Wildrose, Lister Hall, University of Alberta, to highlight exceptional performance in the area of mathematical research and education. Prizes were presented at the Banquet:

Excellence in Teaching Award - **Ian VanderBurgh** (Waterloo)
Krieger-Nelson Prize - **Malabika Pramanik** (UBC)

The film Navajo Math Circles was presented at the University of Alberta. The film follows Navajo students in a lively collaboration with mathematicians.

June 26th – CMS Publications Committee, CMS Student Committee

CMS Annual General Meeting. To focus on what was achieved in 2015, with a short presentation followed by questions and answers. This was an opportunity for participants to get together with the CMS Executive and discuss emerging issues as well as directly voice their opinions, concerns and interests.

Joint CAIMS/CMS Reception. Attended by delegates from both the CMS Summer Meeting and the CAIMS Conference. To celebrate the wrap up of the CMS Summer meeting, and the kick off of the CAIMS Conference.

June 27th – CAIMS/CMS Industrial Event.

A Workshop discussing the Jupyter Notebook open web application, and a two part Panel Discussion on Jobs in Industry.



2016 CMS Winter Meeting

December 2 - 5, 2016, Niagara Falls, ON

The 2016 Winter Meeting was held in Niagara Falls, Ontario and included one Public Lecture, four Plenary Lectures and two joint CAIMS/CMS Plenary Lectures, and 27 scientific sessions. 430 participants attended the 2016 Winter meeting.

The Awards Banquet was held on December 3rd at the Elements on the Falls Restaurant, to highlight exceptional performance in the area of mathematical research and education. Prizes were presented at the awards:

- » Adrien Pouliot Award - **Donald Violette** (University of Moncton)
- » Coxeter-James Prize - **Louigi Addario-Berry** (McGill University)
- » Doctoral Prize - **Vincent Genest** (Massachusetts Institute of Technology)
- » Jeffery-Williams Prize - **Daniel Wise** (McGill University)

International Affairs Committee

The International Affairs Committee acts as a liaison between the Canadian community in the Mathematical Sciences, and international organizations relating to mathematics and mathematics education. As such, the committee also includes representatives from other national organizations such as CAIMS and SSC. For the International Mathematical Union, the committee acts as the Canadian National Committee.

The committee also interacts with the National Research Council of Canada, which provides the funding for Canada's membership of these organizations.

Canada has been a member of the IMU since 1932, and since 1998 has been a "group" country, the top category. The IMU now asks for nominations for ICM speakers from its members, and the main activity of the IAC last year was the preparation of these nominations. We consulted past ICM speakers, and a joint meeting of the IAC and CMS Research committee selected a list of about 20 speakers from Canada to be nominated. While these nominations are received by the appropriate program committees of the ICM, their ultimate impact is unclear.

Martin Barlow (UBC), Chair

Publications Committee

The year 2016 was a busy year for this committee on a number of issues. Perhaps most importantly, a new team of Editors-in-Chief of the Canadian Journal of Mathematics was chosen, namely Louigi Addario-Berry and Eyal Goren of McGill University, to succeed Henry Kim and Robert McCann of the University of Toronto, who had held this position for 10 years. Another change to the two research journals was the introduction, early in the year, of the option for "Gold" Open Access.

Further Committee business included the problem-solving journal *Crux Mathematicorum*, which continued to decrease the backlog. Related to this a possible new edition of the publication "The Canadian Mathematical Olympiad 1969-1993" to celebrate the CMO's 50th anniversary in 2018.

Most of the remaining committee business included "housekeeping issues", including the oversight of the two research journals, the CMS Notes, the CMS-Springer book series, and "A Taste of Mathematics" (ATOM), all of which have been doing well.

The CMS publishes two peer-reviewed research journals as well as various educational publications annually.

In 2016, the CMS published the following:

- » Canadian Journal of Mathematics, (Volume 68);
- » Canadian Mathematical Bulletin, (Volume 59);
- » *Crux Mathematicorum*, (Volumes 41 and 42); and
- » A Taste Of Mathematics (ATOM) Volume XVI: Recurrence Relations.

Karl Dilcher (Dalhousie) Chair

Mathematical Competitions Committee

The Mathematical Competitions Committee (MCC) oversees the Society's involvement in mathematics contests. The Canadian Open Mathematics Challenge (COMC) and the Canadian Mathematical Olympiad (CMO), both jointly sponsored by Sun Life. The MCC is also responsible for Canada's participation in the Asian Pacific Mathematics Olympiad (APMO) and the International Mathematical Olympiad (IMO). Most of the work of the MCC is done by its three subcommittees (the COMC, CMO, and IMO Committees). The MCC and (especially) its subcommittees have been very active, with a large number of deadlines throughout the calendar. We would like to thank all members for their enthusiasm, reliability and hard work in making sure that everything runs smoothly. The CMS Executive Office also deserves our gratitude for their dedication and support.

Canadian Open Mathematics Challenge 2016

The Canadian Open Mathematics Challenge (COMC) is Canada's premier national mathematics competition and is open to any student with an interest in and grasp of high school math. More than 6,500 students wrote the COMC in November 2016. The purpose of the COMC is to encourage students to explore, discover, and learn more about mathematics and problem solving. The competition serves to provide teachers with a unique student enrichment activity during the fall term.

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. We are also thankful to all who volunteered to assist in remarking at the CMS meeting in Niagara Falls in December; in particular, Aaron Berk, Malgorzata Dubiel, Edgar Goodaire, Richard Hoshino, Svenja Huntemann, Andrew McEachern, John Grant McLaughlin, Yingjie Qian, David Rodgers, Zoran Sunic, and Robert Woodrow.

The competition questions were developed by the 2016 Problem Committee, which consisted of Lino Demasi (Chair), Shawn Godin, Margo Kondratieva, Mohamed Omar, and James Rickards, along with problem submissions from Richard Hoshino and Adrian Tang.

The top awards in the 2016 COMC were given in two categories: Canadian-schooled students, and students (regardless of citizenship) at schools outside Canada.

The top awards in the Canadian category were:

- » Gold Awards: Thomas Guo (Olympiads School, North York, Ont.), Rui Ming Xiong (Western Canada H.S., Calgary, Alta.) and Daniel Zhou (Centennial Collegiate, Saskatoon, Sask.).
- » Silver Award: Ben Wei, Waterloo Collegiate Institute.
- » Bronze Awards: Victor Wang, Sir Winston Churchill Secondary School.

In the International category the top competitors were:

- » Gold Award: Nicholas Sun, Phillips Exeter Academy, USA.
- » Silver Awards: Clyde Wesley Ang, Math Trainers Guild of Philippines, Philippines; Philip Lamkin, Phillips Academy, USA; Albert John Patupat, Math Trainers Guild of Philippines, Philippines; Farrell Eldrian Wu, Math Trainers Guild of Philippines, Philippines.
- » Bronze Award: Dick Jessen William, Surya Institute, Indonesia.
- » The top 50 students from the COMC are invited to write the Canadian Mathematical Olympiad (CMO) in March.

Canadian Mathematical Olympiad 2016

The Canadian Mathematical Olympiad (CMO) is Canada's premier national mathematics competition at the Olympiad level. Candidates require an invitation from the Canadian Mathematical Society in order to participate.

The top 3 scores for the 2016 CMO were achieved by:

- » FIRST PRIZE and the Sun Life Financial Cup: **Kai Sun**, AB Lucas Elementary School, London, ON.
- » SECOND PRIZE: **Jinhao Xu**, University Hill Secondary School, Vancouver, BC; and William Zhao, Richmond Hill High School, Richmond Hill, ON.

Students who excel in the CMO and In the Asian Pacific Mathematics Olympiad (APMO) have the opportunity to be selected as part of Math Team Canada to compete in the International Mathematical Olympiad (IMO).

The Asian Pacific Mathematics Olympiad

The 28th Asian Pacific Mathematics Olympiad (APMO) was written in March, with Mexico serving as the coordinating country. Of the 34 Canadian students who wrote the four-hour competition, 10 were Canada's official participants, and Canada ranked 7th among 36 participating countries.

The top Canadian student was Kevin Sun (Phillips Exeter Academy, Exeter, NH, USA), who was given a Gold Award.

- » Qi Qi (Phillips Exeter Academy, Exeter, NH, USA) and Caleb Ji (The Bear Creek School, Redmond, WA, USA) were given Silver Awards.
- » Bronze Awards went to William Zhao (Richmond Hill High School, Richmond Hill, ON), Ruizhou Yang (University Hill Secondary School, Vancouver, BC), Jinhao Xu (University Hill Secondary School, Vancouver, BC), and Nicholas Sun (Phillips Exeter Academy, Exeter, NH, USA).
- » Honourable Mentions went to Ruiming (Max) Xiong (Western Canada High School, Calgary, AB), Daniel Guo (Homestead High School in Cupertino, CA), and Freddie Zhao (ICAE, Troy, MI, USA).

International Mathematical Olympiad 2016

The International Mathematical Olympiad (IMO) is the world championship mathematics competition for high-school students. Canada has proudly participated in the IMO for over thirty years. Team members are chosen based on their results in previous competitions and their eligibility to represent Canada at the IMO. Two important Canadian competitions on the road to the IMO are the **Canadian Open Mathematics Challenge (COMC)** and the **Canadian Mathematical Olympiad (CMO)**.

Math Team Canada 2016 placed 12th out of 109 countries at the IMO in Hong Kong July 6 - 16.

The team members included:

- » **Robert Morewood** - Leader
- » **Hunter Spink** - Deputy Leader (Harvard)
- » **Patrick Lopatto** - Deputy Leader observer (Harvard)
- » **Kevin Sun** – Phillips Exeter Academy - Gold medalist
- » **William Zhao** – Richmond Hill High School - Gold medalist
- » **Qi Qi** – Phillips Exeter Academy - Silver medalist
- » **Kai Sun** – AB Lucas Secondary School - Silver medalist
- » **Ruizhou Yang** – University Hill Secondary School - Bronze medalist
- » **Andrew Lin** – University Hill Secondary School - Honorable Mention

The Society is indebted to many sponsors for the success of the competitions program, particularly to its dedicated and long-term major sponsor, Sun Life Financial.

Dorette Pronk (Dalhousie), Chair

Education Committee

The role of the Education Committee is to help implement education strategies and initiatives, consistent with the society's mission and Strategic Plan. The Committee is also involved in developing new ideas and strategies to either expand the existing programs or to create new ones with the goal of impacting more students and educators. This is accomplished by reviewing reports and issues that may have an impact on education-related topics pertaining to the CMS, by selecting winners for national education prizes, and by recommending support for various educational activities. As part of these general objectives, the committee has a number of specific tasks. These include proposing speakers for education plenary talks at CMS meetings, the selection of organizers for the education sessions at these meetings, the annual selection of the winners of the Adrien Pouliot Award, and the CMS Excellence in Teaching Award, the awarding of grants for math competitions run in different provinces.

- » 2016 CMS Summer Meeting: The education session, titled Mathematics Outreach Programs: Reach Out, Reach Wide, Reach Deep, was organized by Gerda de Vries (Alberta), Malgorzata Dubiel (SFU) and Veselin Jungic (SFU). There were six speakers participating in the session.
- » 2016 CMS Winter Meeting in Niagara Falls: The Education Plenary, History for the Future: Heavenly Storytelling in the Mathematics Classroom, was given by Glen Van Brummelen (Quest); and there were two education sessions: Improving Success Rates in First Year Calculus Class, which was organized by Jaimal Thind and Maria Wesslen (University of Toronto), with eight talks, given by speakers from Canada and UK, and Teaching for Deeper Mathematical Engagement, which was organized by John Grant McLoughlin (University of New Brunswick) and Caroline Junkins (Western). The section had nine speakers.

Malgorzata Dubiel (Simon Fraser), Chair



Math Camps

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 \$250 each.

The 2016 CMS Canada Math Camp took place at the University of Toronto from July 23 - 30, organized by Pamela Brittain. Twenty-two students attended the camp (four female, 18 male). Ten were from Ontario, six from Canada west of Ontario, two from Eastern Canada, one from Quebec, and the remaining three from the USA. The selection process is based predominantly on the results of the COMC with some being invited on a referral basis.

The CMS Math Camps are a major enrichment activity for young Canadian students from coast to coast. Every year, the CMS collaborates with universities and colleges to organize and support math camps in all Canadian provinces.

In 2016, 22 Math Camps, 17 Regional Camps, three National camps and two Specialty Camps took place- with more than 1000 students and volunteers participating overall. For the first time, some CMS Math Camps had more girls than boys attending, showing that our efforts to close the gender gap are beginning to work. We are pleased that more than 80% of students reported increased interest in STEM professions.

Joseph Khoury (Ottawa), Chair

Student Committee

The year 2016 was a fruitful one for StudC in terms of recruiting new membership and undertaking new initiatives. We had four new members join us in June, many of whom will be taking on web-based or technology roles: Simon Huang (Waterloo), Yingjie Qian (McGill), Marie-Andree Langlois (Dalhousie), and Aram Dermenjian (UQAM). Aram took over as Co-Chair for Muhammad Khan (Calgary), who continued as a General Member.

There was a good turnout at the Summer meeting in Edmonton with 10 students at the student social, six

students in the student research presentations, and eight in the poster session. For the Winter meeting, those numbers increased to 30 students at the student social, 12 talks in the student research presentation and 11 posters in the poster session. Hopefully these numbers will increase in the future. The committee supported 6 student conferences which took place across Canada.

CUMC also had another successful year at the University of Victoria under the leadership of the 2016 CUMC President Chloe Lampman. There were more than 130 participants and more than 80 student talks. Next year's CUMC will be held jointly by the four main universities in Montréal: Université de Montréal, McGill University, Université du Québec à Montréal, and Concordia University. It will be led by the CUMC President Alexis Langlois-Rémillard.

Finally, there has been an increase in outreach to students at the various universities throughout Canada. The committee has started keeping track of what societies exist at each university. Additionally there has been more control over social media and plans have developed to better communicate with students throughout Canada.

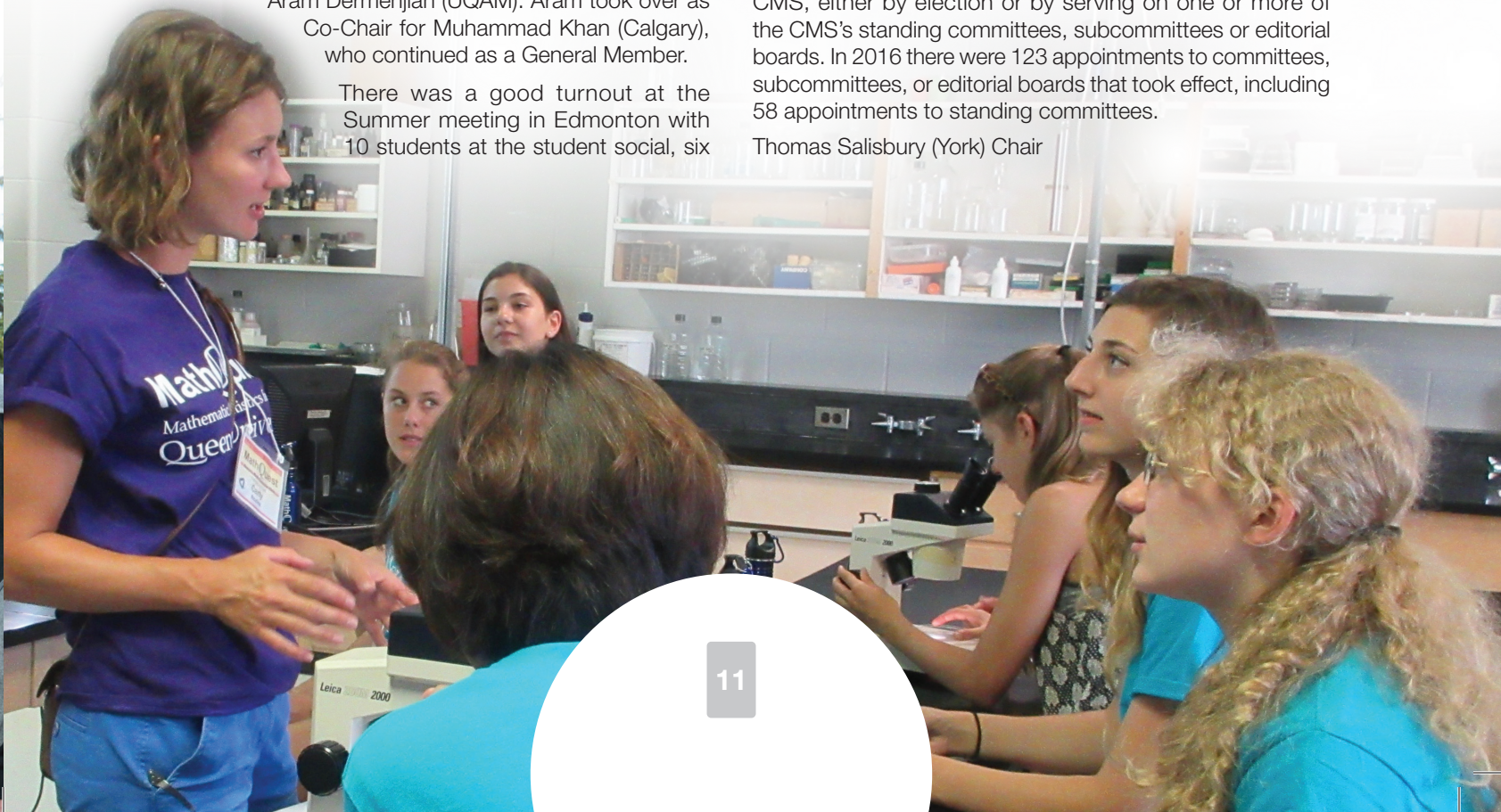
Aaron Berk (UBC) and Aram Dermenjian (UQAM) Co-Chairs

Nominating Committee

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 2016, 177 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 2016 there were 123 appointments to committees, subcommittees, or editorial boards that took effect, including 58 appointments to standing committees.

Thomas Salisbury (York) Chair



Finance Committee

The mandate of the Finance Committee is to provide the Executive Committee and the Board with financial oversight of the operations of the CMS. The committee typically meets twice a year, once in the spring and once in the fall. The spring meeting this year was very much a get acquainted event since all members of the committee were new, including the chair. This did allow us to ask many questions that were at least new to us. The notable request was to ask the Executive Committee to produce a plan for eliminating the long term budget deficit and to state more explicitly the goals of the annual budget. The fall meeting has traditionally been devoted to considering the budget itself and this year was no different. In light of the recommendations from the spring meeting, a narrative for this year's budget was provided and the exact roles of the fundraising activities were made explicit. The Finance Committee remained concerned that publication revenues, one of the largest revenue sources, will continue to decrease. The Executive Committee was asked to strike a committee to consider a long term plan regarding publications, including a review of the expense side of the ledger.

Bradd Hart (McMaster), Chair

Fundraising

The CMS initiated a Fundraising Program in 2016. An Annual Giving Campaign was designed, developed, and implemented. About 900 CMS members were called and asked to renew membership and donate. To better serve members, a new computer system with online membership, payment, and donation capabilities and streamlined workflow was implemented. Materials have been developed for an Estate Planning program. Funder research was carried out and a list of 150 potential funders has been developed. We are seeking grants and/or sponsorships from private foundations, provincial governments, and corporations. A grant proposal with the theme Math at Work was developed and about 100 unique proposals were submitted. Letters and proposals were submitted to the provincial governments. Efforts were made to reconnect with past members of Math Team Canada (IMO). A proposal for a CMS Fellows program was developed.

We were able to raise about \$150,000 in 2016 which enabled the CMS to continue to provide math camp funding for 29 provincial math camps serving almost 1,000 children; and to provide math competitions for over 6,500 students through the Canadian Math Open Challenge (COMC), Canadian Mathematical Olympiad (CMO), and to train and support Math Team Canada at the International Mathematical Olympiad (IMO). Canada placed 12th out of 109 teams in the 2016 IMO.

David Rodgers & Gerri Jensen, Fundraising Consultants

Endowment Grants Committee

The CMS Endowment Grants Committee (EGC) adjudicates proposals for projects that request financial support from the CMS Endowment Grants Competition. Projects that are funded must contribute to the goals of the CMS and to the broader good of the Canadian mathematical community.

In 2016 the total funding requested among the applications considered by the EGC was more than double the amount budgeted to the program. As such, the committee had to make some difficult decisions to arrive at consensus. We are happy to report that in 2016, the CMS funded seven programs promoting the advancement, discovery, learning and application of mathematics among students in Canada.

Tim Alderson (UNBSJ), Chair

Grants

Through the Society's Competitions and Endowment Grant programs, the CMS funds projects that promote the discovery, learning, and application of mathematics in Canada. The following were awarded grants in 2016:

Competition Grants

- » Association Québécoise des jeux mathématiques – Université Laval
- » BC Secondary School Contest for the Okanagan Region – Okanagan College
- » BC Secondary School Contest for the Vancouver Island Region – Vancouver Island University
- » Calgary Elementary School Mathematics Contest – Mount Royal University
- » Caribou Cup – Thorold, Ontario Concours de mathématiques Poincaré – Université de Moncton
- » Nine Chapters on the Mathematical Art Contest – Grand River Chinese School
- » Ontario Math Olympics – Scarborough Association for Mathematics Education
- » Provincial Mathematical Competition – University of Alberta
- » Provincial Mathematical Competition - University of Manitoba
- » Vancouver Math Olympiad – Canadian Secondary School Mathematics Association

Endowment Grants

- » Semaine des Maths (Laval)
- » Trousse éducative de la pièce de théâtre interactive à saveur scientifique/mathématique. (Laval)
- » Math Enrichment at Carleton
- » Montreal Math Circle (Concordia)
- » Math Horizons Day (Ottawa)
- » Math in the Community (Toronto)
- » Unpossible: NL's Math Circles of St. John's Pilot Project (Memorial)

Upcoming International Meetings

Mathematical Congress of the Americas 2017

The second Mathematical Congress of the Americas (MCA) is being staged by the Canadian Mathematical Society (**CMS**) in collaboration with the Pacific Institute for the Mathematical Sciences (**PIMS**), the Fields Institute (**FIELDS**), Le centre de recherches mathématiques (**CRM**), and the Atlantic Association for Research in the Mathematical Sciences (**AARMS**). The event takes place at the Centre Mont-Royal and McGill University from July 24-28, 2017.

Wide participation of mathematicians and students from the Americas (North, South and Central) as well as the Caribbean is expected.

MCA 2017 aims to highlight the excellence of mathematical achievements of the Americas in the international arena and to foster collaboration between the Americas' mathematical communities. The congress is a collective initiative by the Mathematical Council of the Americas.

International Congress on Mathematical Physics 2018

2018 is the first time for Canada to be hosting the International Congress on Mathematical Physics (ICMP) to be held in Montreal, Quebec, Canada from July 23 to July 28, 2018. The International Congress of Mathematical Physics (ICMP), on its three year cycle, is the most important conference of the International Association of Mathematical Physics. The ICMP 2018 will be a major event, where new results and future challenges will be discussed, illustrating the richness and vitality of Mathematical Physics.

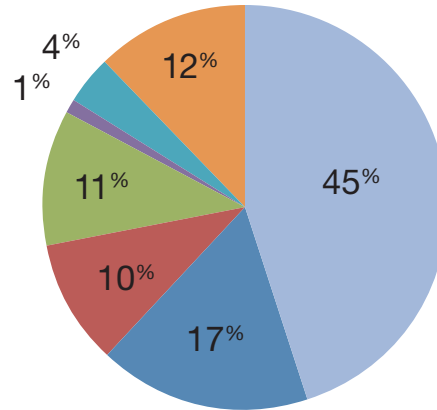
ICMP 2018 will be preceded by the Young Researchers Symposium (July 20 and 21, 2018). Seven satellite meetings are being organized in Banff, Toronto, Montreal, and the Perimeter Institute, either before or after ICMP 2018.



Financial Overview

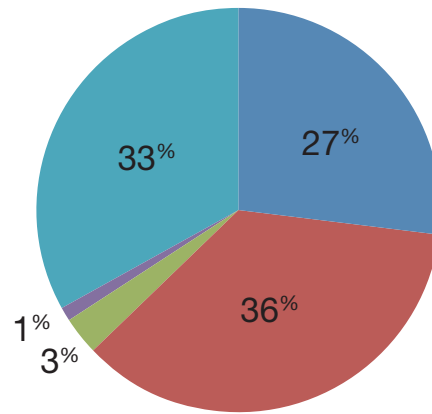
Revenue \$1,433,312

- Registration and other fees
- Membership
- Grants
- Other
- Service, advertising and sales
- Foreign Exchange
- Subscription and Publications



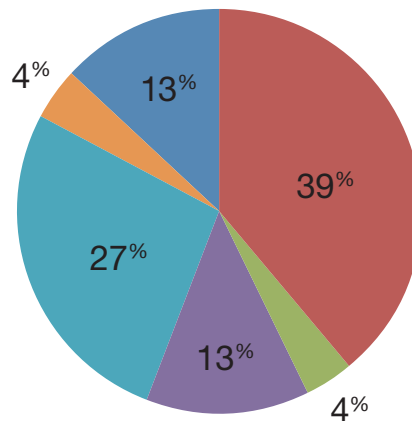
Sales \$1,432,882

- Learning
- Discovery
- Operations
- Other
- Advancement



Invested Funds \$2,264,575

- Lifetime
- Legacy
- Operations
- Olympiads
- Endowment
- Borwein Distiguated Career



Donors

Individual Donors

The Canadian Mathematical Society is very appreciative of the following individuals for their financial support and encouragement as well as those supporters who contributed anonymously to the Society's various activities.

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Karl Dilcher

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Sponsors

The Canadian Mathematical Society would like to acknowledge the following corporations, governments, math societies and institutions for their support of and partnership with the Society's various activities:

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