Pacific Institute for the Mathematical Sciences

PIMS MONTHLY CONNECTION | **September 2022**

Hello from PIMS

September is typically the start of the school year and we hope you all had a restful summer and are ready to start the 2022- 2023 academic year. We look forward to hosting new and returning students, faculty, and staff at all our member universities and affiliated institutions.

One of our highlights from this past summer is the **PIMS Summer Camp for Elementary Math Teachers**. Elementary school math teachers from districts all over BC met with PIMS Education Coordinator, Dr.Melania Alvarez, and UWaterloo Lecturer, Cameron Morland during the month of July. Together, they explored new ways of teaching mathematics and how to better engage their students in the subject. We connected with Jo-Ann Chiu, one of the participants, to find out about her experience. More details are available below.

We are excited to announce the return of **PIMS Network Wide Colloquium**. This month's speaker will be **Prof Bryna Kra (Northwestern University).** We also welcome **CRM-Fields-PIMS Prize** winners, **Balint Virág** (2022 winner) and **Andrew Granville** (2021 winner), both of whom will deliver their lectures in person at the University of British Columbia. These lectures will be available on Zoom, allowing members from the PIMS network to join remotely. Details are available in the "Feature Events" section below.

Nominations for PIMS postdoctoral awards are now open. Candidates must be nominated by a scientist or department affiliated with PIMS. These fellowships are intended to supplement the support provided by the sponsor and are tenable at any of the PIMS Canadian member universities. Nominations close on December 1, 2022.

A reminder that the **PIMS Call for Proposals is currently open until October 1, 2022.** PIMS supports the mathematical sciences community by funding events and collaborations. We provide significant sponsorship for events in active areas of mathematical sciences research. More details are available in the news section below.

See below for more details on this month's news, announcements, and featured events.

Upcoming Deadlines:

- **Today, Aug 31-** PRIMA Early Career Research Showcase: Poster and Short talk
- **October 1**- PIMS Call for Proposals Close
- **October 1**- PIMS-Europe Fellowship Close
- **December 1**- PIMS PDF Nominations Close

Sincerely,
The PIMS Team

NEWS & ANNOUNCEMENTS

PIMS Welcomes Proposals for Activities in 2023.

PIMS is currently accepting proposals for events in 2023 and beyond. Proposals for events such as conferences, workshops, summer schools, distinguished visitors, focus periods, collaborative research groups, and related activities in the mathematical sciences are accepted. Activities should occur after April 1, 2023. Proposals will be accepted until **October 1, 2022**.

See Funding Details

We are accepting applications for PIMS-Europe Fellowships (CNRS IRL #3069). The goal of this program is to develop and support research collaborations between mathematical scientists at PIMS member universities and researchers across France. These fellowships will champion a mutual exchange of knowledge and talent while encouraging cross-ocean research on the frontline of the mathematical sciences. Fellowship awardees will receive CAD $5,000 to facilitate long-term visits to France. Application deadline is **October 1, 2022**.

See Fellowship Details

PIMS Virtual Experimental Mathematics Lab.

The PIMS Virtual Experimental Mathematics Lab (VXML) is a new initiative which brings together world-leading faculty members, postdocs, graduate students and undergraduate students to work on exciting research problems in mathematics. Project teams from throughout the PIMS

network work together to tackle challenging research problems through experimental, computational and visual mathematics, showcasing mathematics as a creative discipline.

Research problems are proposed by a faculty member or postdoc at a PIMS member (or affiliate member) university, and a project team consisting of the mentor, a graduate student and 2-4 undergraduate students are formed to work on the problem (we encourage teams that integrate members from multiple PIMS sites). Teams commit 6-8 hours per week to work on the project and to meet to discuss their discoveries. Students will use a mixture of computational tools such as CoCalc (Sage Math Cloud), to work and collaborate.

We are now accepting new proposals from faculty and postdocs for projects for the first edition of the VXML. The deadline for project submissions is **September 15, 2022.**

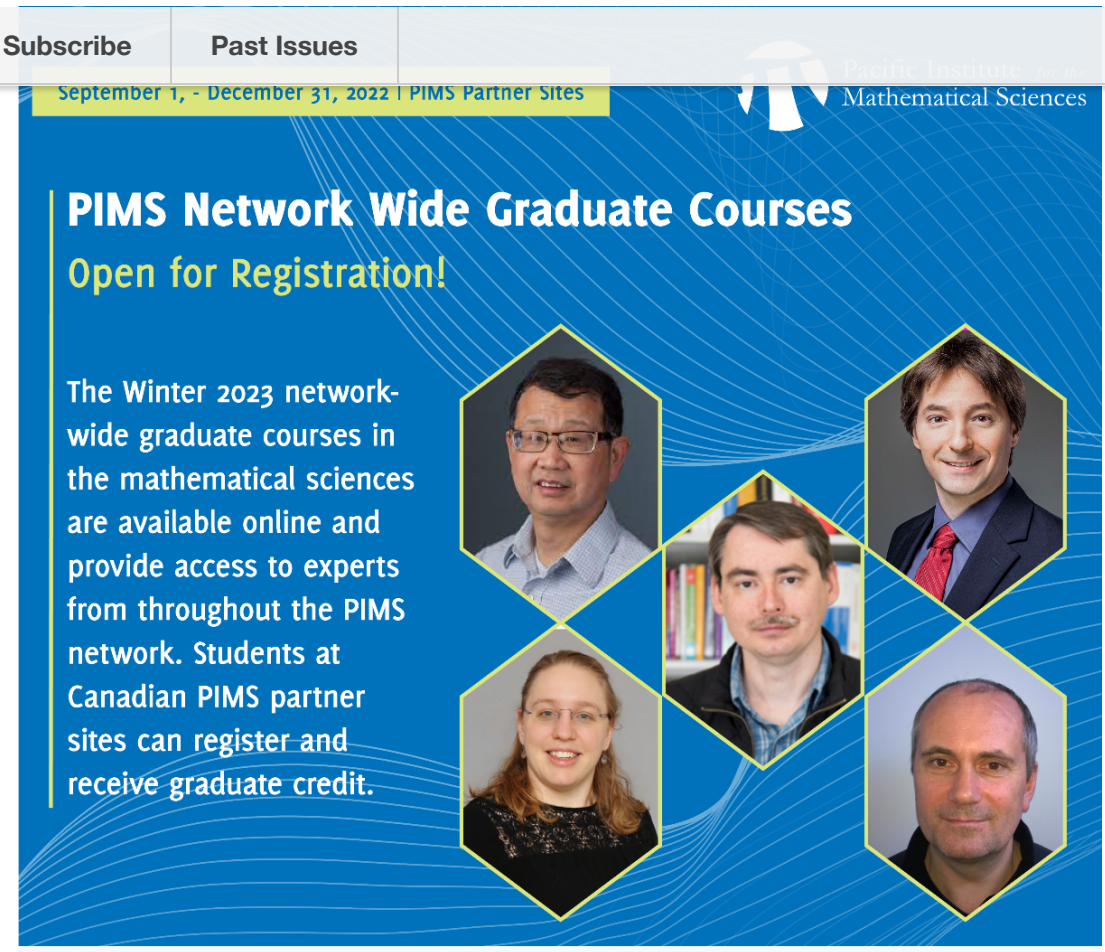
See VXML details

Nominations for PIMS Postdoctoral Positions Now Open.

PIMS invites nominations of outstanding young researchers in the mathematical sciences for postdoctoral fellowships beginning in the academic year 2023-2024. Candidates must be nominated by a scientist or department affiliated with PIMS. These fellowships are intended to supplement the support provided by the sponsor, and are tenable at any of the PIMS Canadian member universities: the University of Alberta, the University of British Columbia, the University of Calgary, the University of Lethbridge, the University of Manitoba, the University of Regina, the University of Saskatchewan, Simon Fraser University and the University of Victoria.

Award decisions are made by the PIMS PDF Review Panel based on the scientific qualifications of the candidate, demonstrated scientific leadership, the fit between the research interests of the candidate and those of the sponsor, and adequacy of matching funds. We strongly encourage people from historically underrepresented groups to apply for these positions. **Nominations close on December 1, 2022**.

See Nomination Details



PIMS Network Wide Graduate Courses 2023.

Registration for Winter 2022-2023 PIMS Network-Wide Graduate Courses is now open. Students at Canadian PIMS member universities can register for these courses and receive graduate credit via the Western Deans Agreement.

- Gaussian and Empirical Process Theory for High Dimensional Statistics
- Nanoscale Modelling and Simulations
- Lie Groups: Structure and Representation Theory
- Analytic Number Theory II
- Methods for Multivariate Data
- Stochastic Differential Equations
- Geometry and Mechanics
- Algebraic Topology
- The Mathematics of Evolution
- Classifying Spaces of Algebraic Groups

See the Courses Website for more information and registration details. In some cases, students must enroll **6 weeks** in advance of the next term, so register early.

See Course Details

EDUCATION HIGHLIGHTS

Q & A with Jo-Ann Chiu: Elementary School Teacher and Participant at the 2022 PIMS Math Summer School for

Throughout the month of July, elementary school math teachers from districts all over BC met with PIMS Education Coordinator, Dr.Melania Alvarez, and UWaterloo Lecturer, Cameron Morland. Together they practiced various exercises, shared ideas, and watched videos—all for the purpose of getting their students hyped on mathematics. We connected with Jo-Ann Chiu, one of the participants to find out about her experience at the summer camp.

What has your journey in this year's teachers camp been like? My journey has been absolutely fantastic and transformative! It was hard work and intense—but in a nice way. I learned so much, and I can tell that I've developed new ways of mathematical thinking even in my own life in addition to what I will be applying to teaching!

What new things have you learned?

I've learned so many things! My favourites are the crazy-fun arts and crafts activities that actually contain sophisticated math concepts. Compass arts, origami, popsicle stick mysteries, pattern-hunting with Pascal's triangles, and cellular automata fun—to name just a few. I also learned amazing pedagogy activities for teaching the core numeracy skills. I was also inspired to learn that what we do now in the primary years really will make a long-term impact on students even when they go on to high school and university, and, if they choose, employment in industry.

What will you be taking with you after the summer school ends and school begins in September?

My biggest transformation has been switching from teaching a linear curriculum to teaching a spiral curriculum. For example, I am planning on starting every Monday with a number families focus that will be referred to for the entire week, and teach numeracy in a more integrated way, such as addition and subtraction simultaneously. Then, finishing the week with combination geometry-art activities. I have also learned great open-ended math activities that can be added to students' choices of math centres. I think students will enjoy those activities so much that they may even choose to do them during their spare time—and practise sophisticated math concepts at the same time. Some of my favourites that I learned from this course are: Pattern-hunting with Pascal's triangle, cellular automata arts, maximum-length sequencing using beading crafts, and origami.

See more K-12 Programs at PIMS

Callysto: Call for Proposals.

If you teach Grades 5-12 students in Canada, Callysto wants to help fund your classroom activities related to **computational thinking, data literacy, and coding**. Callysto is a free, online program that helps Grades 5-12 students and teachers in Canada learn and apply in-demand data science skills — including data literacy, analysis, visualization, coding, and computational thinking — across any subject matter.

This is Callysto's fifth Call for Proposals — the theme for this Call for Proposals is **Developing Responsible Digital Citizens**. Read about our past recipients for proposal ideas and inspiration.

Applications will be accepted as part of a rolling intake until 4:00 pm Mountain Time on **October 14, 2022**, for activities occurring between September 1 – March 31, 2023. Visit the Callysto website to read more about award details, assessment criteria for submitting proposals, and eligible activities.

See Callysto Application Details

CRM-Fields-PIMS Prize Colloquia.

2022 Winner: Balint Virág

September 23, 2022: Hybrid

Prof. Bálint Virág earned his Ph.D. at the University of California, Berkeley in 2000, after which he was a Moore Instructor at the Massachusetts Institute of Technology, before coming to the University of Toronto in 2003 as a Canada Research Chair. Among other awards, he has received the Rollo Davidson Prize in Probability, the Canadian Mathematical Society's Coxeter-James Prize in 2010 and the John L. Synge Award from the Royal Society of Canada in 2014. Virág was a speaker at the International Congress of Mathematicians in 2014. See the 2022 announcement here.

2021 Winner: Andrew Granville

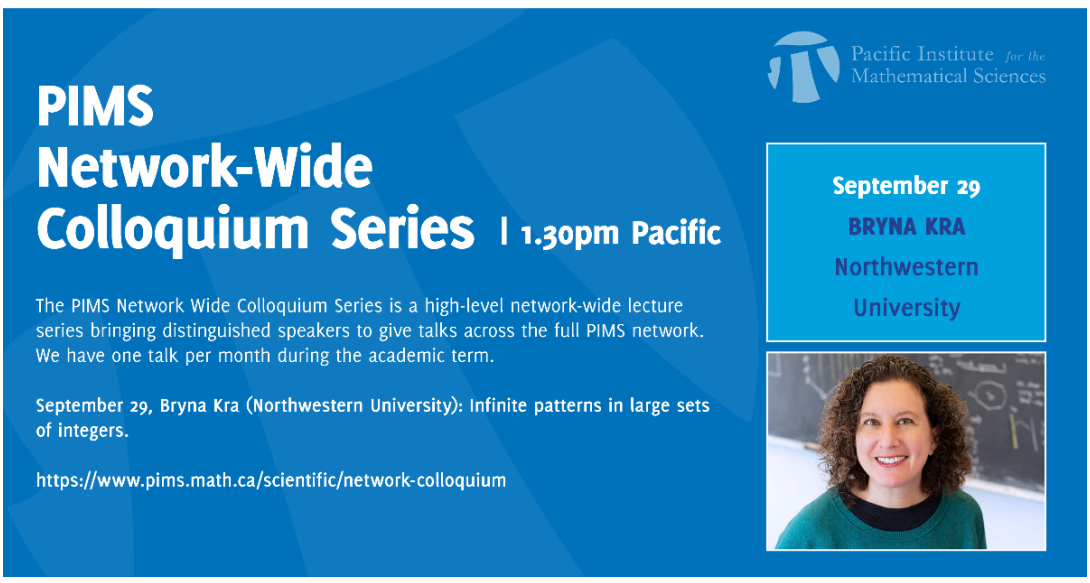
September 28, 2022: Hybrid

Prof. Andrew Granville is a professor in the Department of Mathematics and Statistics at the Université de Montréal. His broad range of mathematical interests include arithmetic geometry, Diophantine approximation, algorithmic and cryptographic aspects and analytic number theory, and he has more than 160 publications. His writing accomplishments also include a theatrical play and a widely acclaimed graphic novel that explores mathematical themes. Dr. Granville obtained his PhD from Queens University in 1987. In 2002, he joined the Department of Mathematics and Statistics at the Université de Montréal as a senior Canada Research Chair. See the announcement here.

About the Prize:

The CRM-Fields-PIMS prize is the premier Canadian award for research achievements in the mathematical sciences. It is awarded jointly by the three largest Canadian mathematics institutes: the Centre de Recherches Mathématiques (CRM), the Fields Institute, and the Pacific Institute for the Mathematical Sciences (PIMS).

See Colloquium Details



PIMS Network Wide Colloquium Series: Bryna Kra

September 29, 2022: Online

Infinite patterns in large sets of integers

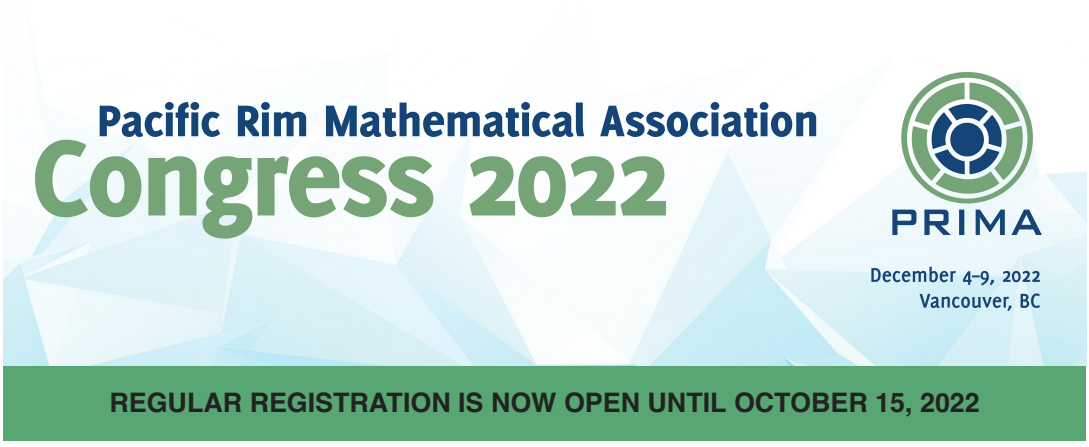
Resolving a conjecture of Erdos and Turan from the 1930's, in the 1970's Szemeredi showed that a set of integers with positive upper density contains arbitrarily long arithmetic progressions. Soon thereafter, Furstenberg used Ergodic Theory to gave a new proof of this result, leading to the development of combinatorial ergodic theory. These tools have led to uncovering new patterns that occur in any sufficiently large set of integers, but until recently all such patterns have been finite. Based on joint work with Joel Moreira, Florian Richter, and Donald Robertson, we discuss recent developments for infinite patterns, including the resolution of conjectures of Erdos.

See Colloquium Details

View our calendars for more meetings and events

Scientific Events

PRIMA Notices



Pacific Rim Mathematical Association (PRIMA) Congress 2022.

Regular Registration closes October 15, 2022 at 11:59pm PST

Dec 4–9, 2022: In-Person, Vancouver, BC

The 2022 Pacific Rim Mathematical Association Congress will take place in Vancouver, Canada, between **December 4-9, 2022**. The fourth meeting will be hosted by the Pacific Institute for the Mathematical Sciences (PIMS).

- **Regular Registration**: Aug 1 - Oct 15
- **Late Registration**: Oct 15 - Dec 9

Visit the PRIMA Congress 2022 website to read more about the program, how to register for tickets, and featured plenary and public speakers.

Get your tickets!

PRIMA Early Career Research Showcase and Career Fair.

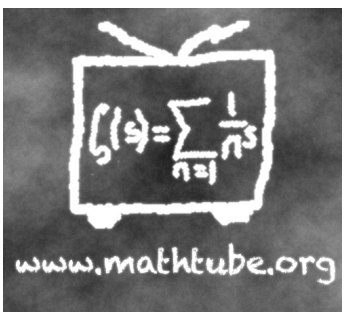
Whether you are a graduate student or postdoctoral scholar, take advantage of this full day dedicated to early career researchers.

- **Submit your abstracts for a short talk or poster session** here **by August 31**

- Attend the PRIMA career fair and see what industry positions are open.

- **Date**: December 7, 2022

MEDIA



Missed a Lecture? Go to Mathtube.Org

Since 1996 PIMS has collected and maintained an archive of videos and lecture notes covering many areas of the mathematical sciences. If you missed a Network Wide Colloquium or a PIMS Emerging Research Seminar, visit www.mathtube.org to see these and other archives.

ABOUT PIMS

The Pacific Institute for the Mathematical Sciences (PIMS) was created in 1996 to promote discovery, understanding, and awareness in the mathematical sciences. PIMS has expanded from the mathematics community of Alberta and British Columbia to include Washington State, Saskatchewan, and Manitoba. Our mandate is to promote research in and applications of the mathematical sciences, to facilitate the training of highly qualified personnel, to create an equitable, diverse and inclusive community, to enrich public awareness of and education in the mathematical sciences, and to create mathematical partnerships with similar organizations in other countries in the Pacific Rim. PIMS funds Collaborative Research Groups, Post-Doctoral Fellowships, and individual events on a competitive basis.

We Want to Hear from You

Share your feedback on this month's newsletter and tell us what stories and news you would like to hear more of.

Feedback

Your Support Makes a Difference

PIMS education and outreach programs touch countless educators, students, and Indigenous communities. Some of our activities include summer schools, mathematics contests and meetings for educators Learn more

Donate to PIMS

Follow PIMS and be a part of our community

Mailing address:
Pacific Institute for the Mathematical Sciences
The University of British Columbia
4176-2207 Main Mall
Vancouver, BC V6T 1Z4
Canada

We acknowledge with gratitude that PIMS central office is located on the unceded, traditional, and occupied territory of the Coast Salish peoples. This includes the territories of the xwməθkwəy̓əm (Musqueam), Skwxwú7mesh (Squamish), and Səl̓ílwətaʔ/Selilwitulh (Tsleil-Waututh) Nations.
www.native-land.ca