Pacific Institute for the Mathematical Sciences

PIMS MONTHLY CONNECTION | **October 2021**

Hello from PIMS

The PIMS mandate is to promote research in and applications of the mathematical sciences of the highest international caliber and enhance the mathematical training of researchers, teachers, and students from K-12. The addition to our mandate --**"to create an equitable, diverse and inclusive community in the mathematical sciences"**, is an area that we have begun to explore with our EDI Committee, executive leadership, and research community. Please look forward to more engagement on this topic.

To increase awareness of the **funding, education, and outreach** we participate in, we have created a PIMS-at-a-Glance info sheet, a takeaway for you to share amongst your networks.

Good news! We have **extended our deadline for proposal submission to October 15** so you have a bit more time to submit applications for your 2022 events/activities. PIMS provides significant sponsorship for events in all areas of mathematical science research.

And don't forget, the **deadline for nominations for the annual CRM- Fields-PIMS Prize is coming up quickly on November 1**. This is the premier prize for research awarded jointly by the three Canadian mathematics institutes. As part of our commitment to equity, diversity, and inclusion, we encourage nominations of women and of members of underrepresented groups.

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

Sincerely,
The PIMS Team

Participants learn from respected Îyârhe Nakoda Elder Tom Snow, on traditional bow and arrow making

EDUCATION HIGHLIGHT: Bows, Arrows & Math

In July and August, TELUS Spark Science Centre and FIMS supported Îyârhe Nakoda Youth to create bows and arrows using Indigenous and Western knowledge, science, engineering, and math. Knowledge was passed on through stories by local Îyârhe Nakoda Elders and Knowledge Keepers. From this knowledge, participants learned experientially to locate adequate trees, how to carve, and the importance of testing and breaking different arrows and bows. Experiential methodologies are central to learning through Indigenous perspectives, as they allow our body and spirit to learn relationally.

Scientific Highlights:

- Trajectory (how to fire a bow, angles, movement)
- Force of bows (differences between wood, size, balance, purpose)
- Arrow Aerodynamics (feather positing, wood)
- Relationally between trees, water, and ideal wood for bows
- Biology of different trees (chokecherry, diamond willow) used for different of bows
- Science of traditional materials (rocks, hide, granite, sap, sinew)
- Leverage in making and shaping the bows and arrows

This workshop took place in Îyârhe Stoney Nakoda Land and Calgary, Alberta-- which is situated on the traditional territories of the people of the Treaty 7 region in Southern Alberta, which includes the Blackfoot Confederacy (comprising the Siksika, Piikani, and Kainai First Nations), the Tsuutina First Nation, and the Îyârhe Stoney Nakoda (including the Chiniki, Bearspaw, and Wesley First Nations). Calgary is also home to Métis Nation of Alberta, Region 3.

"I enjoyed the stories and the lessons of the bow and arrow. I learned how to make a whistle [from a piece of willow]."—Participant

"I enjoyed making friends and learned a lot about curves and math."—Participant

"It was fun and creative."—*Participant*

"I learned that it is ok to break your bow!"—Participant

Scientific aspects of the workshops were explained through Indigenous story, a process of passing on knowledge of, for example, where to find specific willow when you need to make a quick bow for quick meal.

NEWS & ANNOUNCEMENTS

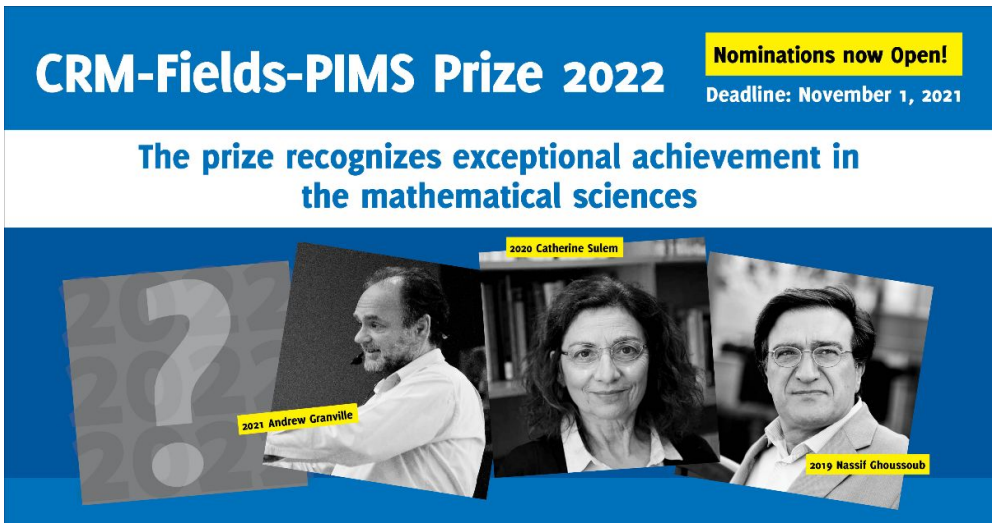
DEADLINE EXTENDED! PIMS Welcomes Proposals for Activities in 2022

Proposals will be accepted until October 15, 2021.

PIMS is currently accepting proposals for events in 2022 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, 2022 or later.

PIMS Network Wide Graduate Courses

PIMS is excited to announce eight! new PIMS Network Wide Graduate Courses for spring 2022. Students at PIMS member universities may *register for these courses, participate remotely, and receive credit for them under the Western Deans Agreement. The courses run for one term, beginning in January 2022 (individual start dates vary by institution). ***Please note some institutions require you to register 6 weeks before the course starts (November 26th in some cases).***



2022 CRM-Fields-PIMS Prize - Submit your Nominations!

The prize recognizes exceptional achievement in the mathematical sciences. It was established by the Centre de recherches mathématiques and the Fields Institute as the CRM-Fields prize in 1994. In 2005, PIMS became an equal partner. The winner, selected by a committee appointed by the three institutes, receives a monetary award, and an invitation to present a lecture at each institute within one year after the award is announced. We encourage nominations of women and of members of underrepresented groups. **Nominations close on November 1, 2021.**

FEATURE EVENTS

The PIMS Postdoctoral Fellow Seminar: Youngmin Park

Oct 13. Online.

Hear Youngmin Park (UManitoba) speak on *High-Order Accuracy Computation of Coupling Functions for Strongly Coupled Oscillators*.

Women Leading Change in STEM
Oct 13. In-person + Online

Special event hosted by Government House and the University of Victoria

Join in the conversation with Julie Angus, Open Ocean Robotics, Mina Hoorfar, UVic Engineering and Computer Science, Sue Paish, Canada's Digital Technology Supercluster and Denise Williams, First Nations Technology Council. Moderated by Her Honour, Janet Austin, Lieutenant Governor of British Columbia, the panel will talk about increasing equality, diversity and inclusion in science, technology, engineering and math and share stories that will connect, inspire and empower.

2021 PIMS-UBC Math Job Forum for Postdoctoral Fellows and Graduate Students
Oct 22. Online.

The PIMS-UBC Math Job Forum is an annual Forum to help graduate students and postdoctoral fellows in Mathematics and related areas with their job searches. Previously held at UBC, the event is now open to junior researchers at PIMS member universities. The session is divided in two parts: short presentations from our panel followed by a discussion.

Mean Field Games on Networks Workshop
Oct 26–29. Online.

Mean Field Game (MFG) theory studies strategic decision problems in large populations of interacting agents, which is now widely applied in economics, financial markets, engineering, social science, and many other areas. The generalization of classical mean field game theory to the study of problems on networks that exhibit heterogeneity, bounded local connections, dynamic dependence, and uncertainties in structure is extremely important in terms of theoretical development and practical applications; it is the focus of the proposed workshop.

The PIMS Postdoctoral Fellow Seminar: Thomas Theurer
Oct 27. Online.

Thomas Theurer (UCalgary) will be presenting on Quantum Operations as Resources. After an introduction to the general topic, Thomas will speak about his recent research on how these concepts can be extended to quantum operations and why this is of interest.

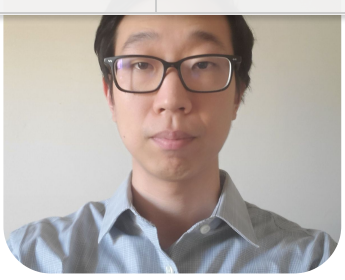
PIMS Network Wide Colloquium: Maryanthe Malliaris
Oct 28. Online.

Model theory and complexity

Click below for upcoming events

Scientific

MEDIA



Meet PIMS PDF Youngmin Park

"For networks of oscillators in CPG circuits, the desired property often involves phase differences between oscillators. One of the most general methods to this end over the past 50 years includes the classic "weak coupling" theory—however, it comes with the significant caveat that oscillators influence each other very weakly. In my work I extend this theory to include strong coupling, allowing for applications in more realistic CPG circuits where neurons are strongly coupled." —Youngmin Park, University of Manitoba

Meet PIMS PDF Thomas Theurer

"After my Ph.D., I joined Gilad Gour and Carlo Maria Scandolo in Calgary, who are amongst the leading experts in quantum resource theories too. I will continue working on resource theories but broaden my focus from coherence to other quantum resources. Moreover, we intend to link the rather abstract framework to more concrete applications." —Thomas Theurer, University of Calgary

To view past lectures and other PIMS resources, please visit mathtube.org

PIMS COMMUNITY RECENT PUBLICATIONS

1. S. Wang, A. Berger, H. Qian & Y. Yi. Intermittent synchronization in nite-state random networks under Markov perturbations, Comm. Math. Phys. 384 (2021), no. 3, 1945{1970.
2. R.Clouâtre & E. J. Timko, Gelfand Transforms and Boundary Representations of Complete Nevanlinna Pick Quotients. Trans. Amer. Math. Soc. 374 (2021), no. 3, 2107-2147

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

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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