Pacific Institute *for the* **Mathematical Sciences**

PIMS MONTHLY CONNECTION | **JANUARY 2023**

UNBC UNIVERSITY OF NORTHERN BRITISH COLUMBIA

Hello from PIMS

Welcome to 2023! We hope you enjoyed the holidays, had a restful break, and are ready for a new year of activities with PIMS. We had the pleasure of hosting the 2022 PRIMA Congress last December where we welcomed a wide array of mathematicians from across the globe. The PRIMA planning team is now evaluating locations for the next meeting, and we hope you will be able to participate.

We are pleased to share our **2023 Event Highlights Calendar**, which showcases some of our upcoming meetings and events.

Our PIMS PDF Seminar Series also resumes this month. The seminars are an excellent opportunity to connect with current PIMS postdoctoral scholars as they continue their research at our member universities. **Goudong Gai**, the PIMS-CNRS PDF at UBC, will be presenting on January 25th. Mark your calendars!

PIMS is welcoming **applications for support of educational activities** aimed at creating opportunities for students to learn, for teachers to improve their knowledge of mathematics, statistics, and computer science, and for their capacity to teach. Examples include math fairs, summer camps, hack-a-thons, and teacher training workshops. The deadline for submission is **February 28, 2023**.

UPCOMING DEADLINES

- **February 1** - Deadline for Minisymposia proposals for the Computational and Mathematical Population Dynamics Conference
- **February 28** - Applications for Education Activities
- **February 28** - Callysto Applications
- **April 10** - Application for admission to the Summer School on Forecasting and Mathematical Modeling for Renewable Energy
- **March 30** - Applications due for Team Up! Pathways to Inclusive Research

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

Sincerely,
The PIMS Team

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NEWS & ANNOUNCEMENTS

PRIMA 2022 Highlights.

The 2022 Pacific Rim Mathematical Association Congress took place in Vancouver, Canada, from December 4-9, 2022. PIMS had the pleasure of hosting a distinguished array of speakers and participants from around the globe. The congress is held every four years where mathematical scientists from around the Pacific Rim converge to discuss the latest developments in Mathematics. This year's congress featured public and plenary talks from top mathematical scientists, as well as special sessions spanning pure and applied math, Indigenous mathematicians, a job fair (with Boeing, CoCalc, PIMS, and Springer), and research from early career scholars. We've posted a few pictures from the meeting below.
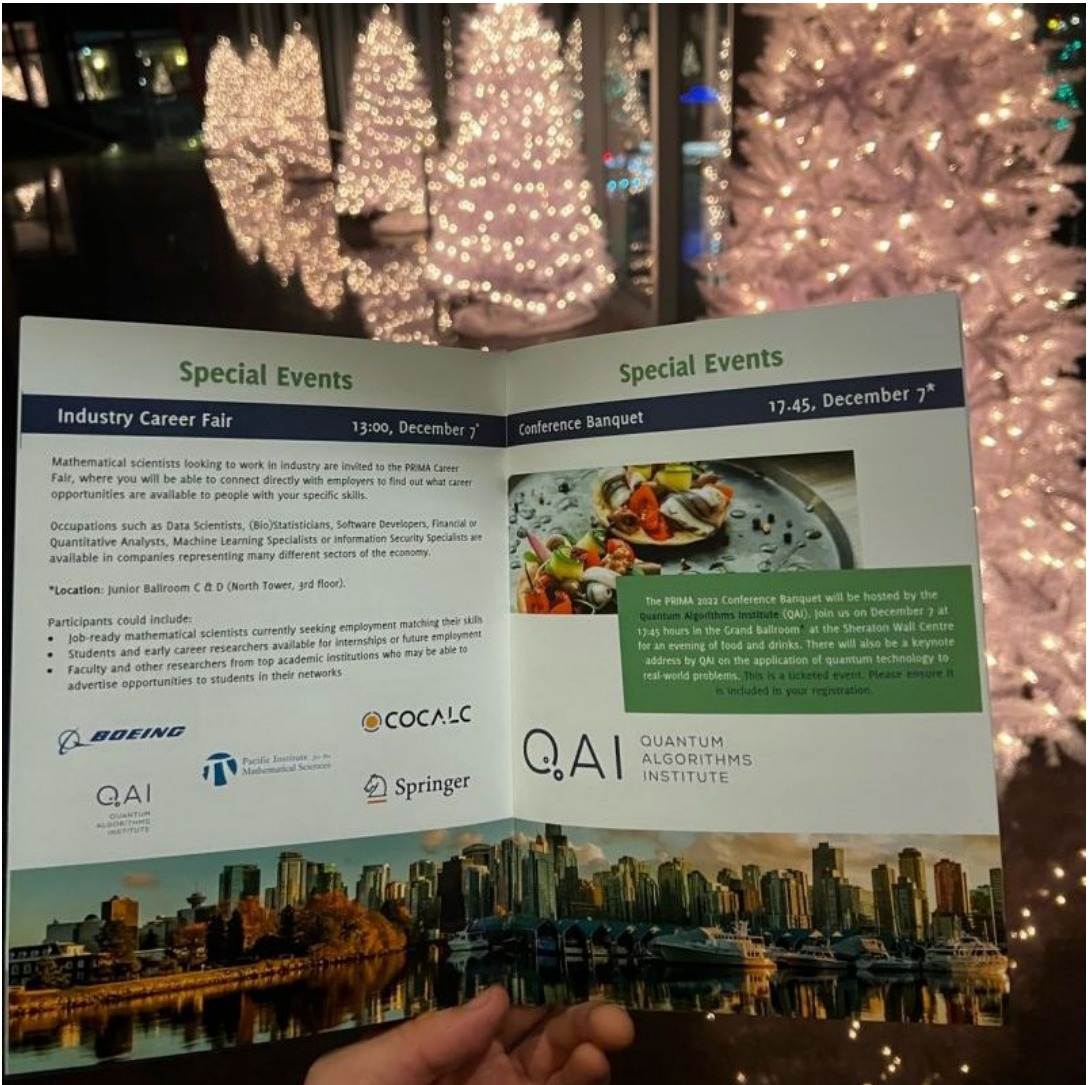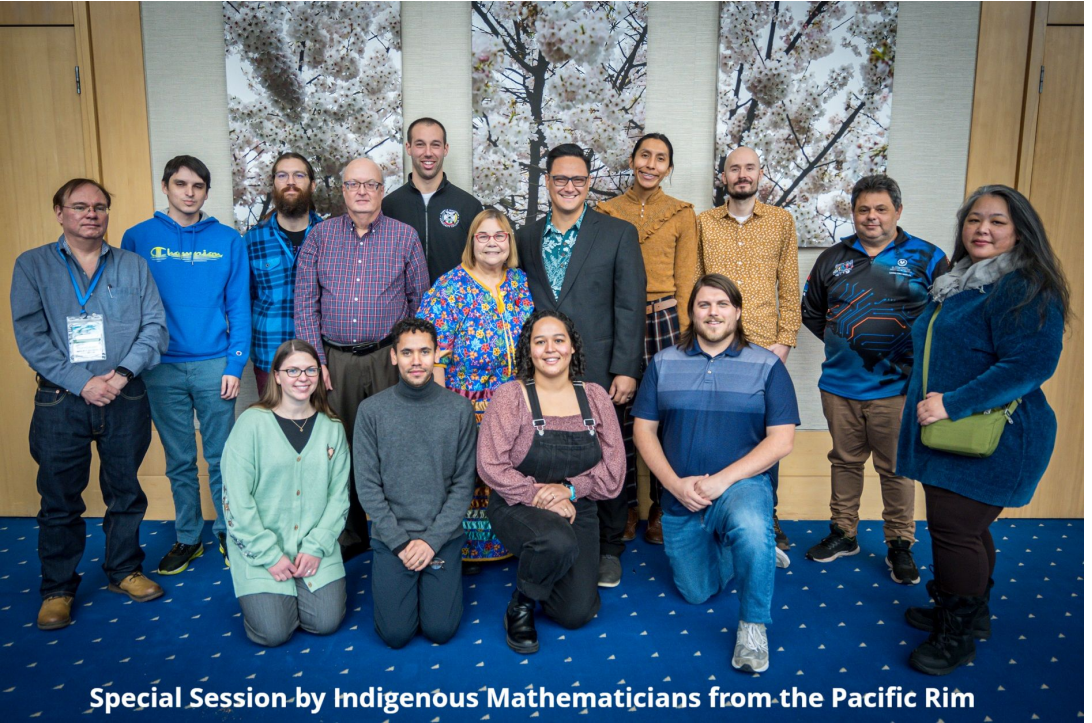

PIMS hosted the PRIMA 2022 Congress which featured an industry career fair with Boeing, CoCalc, PIMS, and Springer.
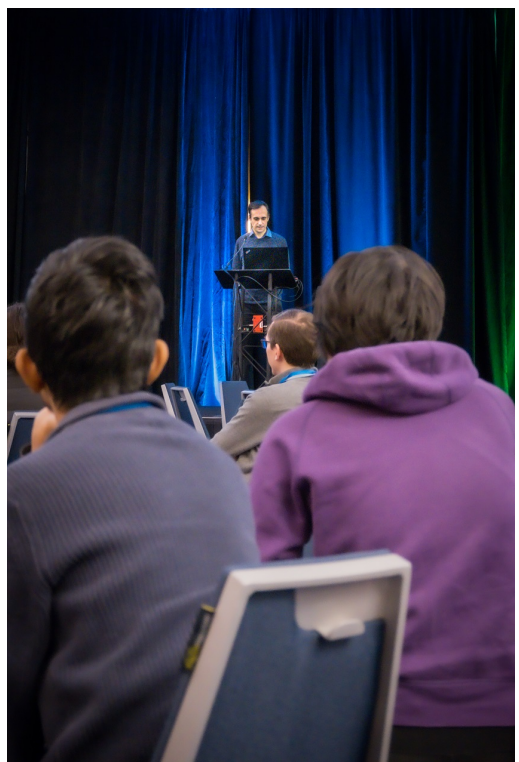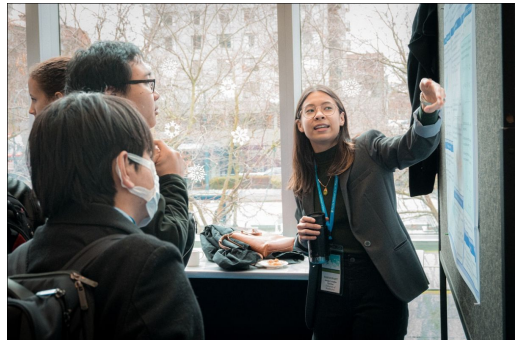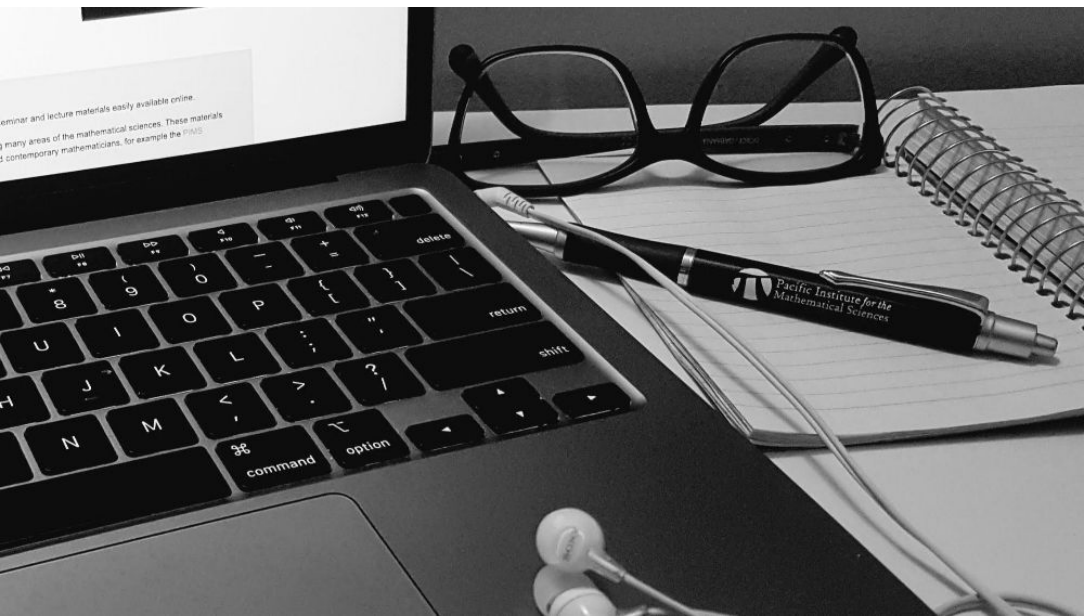
Special Session by Indigenous Mathematicians from the Pacific Rim

Call for Network-wide Graduate Courses: 2023-2024.

We invite proposals for PIMS Network Wide Graduate Courses in the mathematical sciences to take place in either term of the 2023-2024 academic year. Instructors participating in this program will benefit by reaching a larger potential audience, and from interactions with fellow instructors and PIMS staff on how to best develop network-wide offerings. These courses will be designated as PIMS network-wide graduate courses, and will be advertised and promoted throughout the PIMS network. If you are interested in participating as an instructor, please complete the instructor application form by **April 15th, 2023**.

Submit A Course

FEATURE EVENTS

Testing Gravity Conference.

January 18 - 21, 2023: Simon Fraser University

The Testing Gravity 2023 (TG2023) conference is planned in person at the SFU Harbour Centre, Vancouver, from January 18-21, 2023. TG2023 will be the 4th Testing Gravity conference and will bring together leading theorists and experts on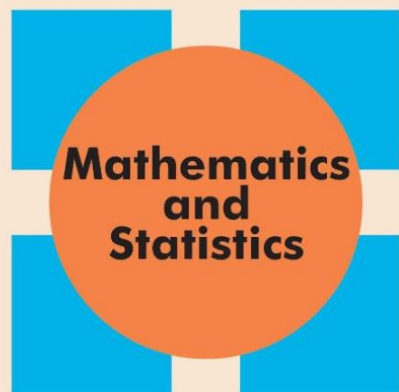 various ways of testing the laws of gravity. Previous TG conferences held in 2015, 2017, and 2019 were each attended by over 120 scientists from diverse backgrounds, who came in from over 15 countries, with many of them being recognized leaders in their respective fields.

Event Details

Prairie Mathematics Colloquium: Payman Eskandari.

January 23, 2022: Hybrid, University of Regina

Periods in number theory and algebraic geometry.

Supported by PIMS, URegina, UManitoba and USaskatchewan, the Prairie Mathematics Colloquium is an opportunity for mathematicians to converge with the underlying goals of sharing interesting mathematics while initiating and fostering new collaborations, which in turn, strengthen the mathematical community on the prairies of Canada. The next keynote speaker is Payman Eskandari (UWinnipeg), whose talks will give an introduction to periods and Grothendieck's period conjecture.

Event Details

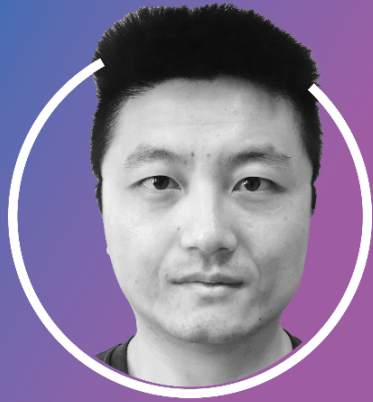## PIMS Emergent Research: PDF Seminar Series.

Emergent Research:

The PIMS Postdoctoral Fellow Seminar

Jan 25, 2023 | 9:30am Pacific

Pacific Institute Mathematical Sciences

Dynamics and Wakes of a Fixed and Freely Moving Angular Particle in an Inertial Flow

Guodong Gai
University of British Columbia

January 25, 2023: Online, Guodong Gai, UBC

Dynamics and Wakes of a Fixed and Freely Moving Angular Particle in an Inertial Flow.

We investigate the interaction between a Platonic solid and an unbounded inertial flow. For a fixed Platonic particle in the flow, we consider three different angular positions: face facing the flow, edge facing the flow, and corner facing the flow, to elucidate the effects of the particle angularity on the flow regime transitions. The impact of these angular positions, notably on drag and lift coefficients, is discussed. The particle cross-section area has a prominent influence on the drag coefficients for low Reynolds numbers, but for higher Reynolds numbers, the impacts of angular positions are more significant. As for the freely moving particle, the change in symmetry of the wake region and path instabilities are strongly related to the particle's angular position and the transverse forces. We analyze and determine the two well-known regimes transitions: the loss of symmetry of the wake and the loss of stationarity of the flow.

Speaker Biography:

Guodong Gai is a PIMS-CNRS postdoctoral scholar working in fluid mechanics. He currently works with Prof. Anthony Wachs in the Mathematics Department at the University of British Columbia. He completed his Ph.D. from INSA Rouen, at the University of Normandy in France.

[**Register for the PDF Colloquium**]

UNIVERSITY OF CALGARY

Pacific Institute *for the* Mathematical Sciences

PIMS Lunchbox Lecture

**February 2
12pm Mountain**

DR. WILTEN NICOLA

University of Calgary

Dr. Wilten Nicola is an Assistant Professor and Tier II Canada Research Chair in Computational Neuroscience in the Department of Cell Biology and Anatomy, at the Cumming School of Medicine in the University of Calgary. His research focus in computational neuroscience is to investigate how the dynamics of single neurons or neuron models interact with and alter their connectivity via synaptic plasticity to create emergent behaviours at the network and organism level.

PIMS Lunchbox Lecture: Dr. Wilten Nicola.

February 2, 2023: In-person, University of Calgary

Spiking Networks and Neuromorphic Computing

The human brain contains on the order of 100 billion neurons, collectively implementing the functions and behaviours that ensure our survival, and endow us with intelligence. While the

mathematical modelling of single isolated neurons was achieved decades ago by Hodgkin and Huxley, we have yet to determine how to couple networks of neurons to perform meaningful functions and operations. This talk will present some recent advances in training recurrent spiking neural networks with reservoir-based computing methods. These powerful techniques allow for the training of systems where a gradient either does not exist or is not easy to compute. Reservoir-based training methods are a class of techniques to potentially train models of real biological neurons as artificial neural networks, leading to potentially novel neuromorphic applications.

Sign up for the Lecture

View our calendars for more meetings and events

Scientific Events

EDUCATION HIGHLIGHTS

PIMS Education Call for Proposals 2023 Open.

PIMS welcomes applications to support education activities in the mathematical sciences to occur after April 3, 2023. Applications are open now until the deadline of **3pm Pacific Time on February 28, 2023**. We will be awarding grants from $500 up to $5000. This year we have coordinated deadlines with Callysto (see below) and applications with joint mathematical and computational components are encouraged to apply to both programs. Proposals will be reviewed by the PIMS Education Review Panel in early March, with awards announced on March 15th.
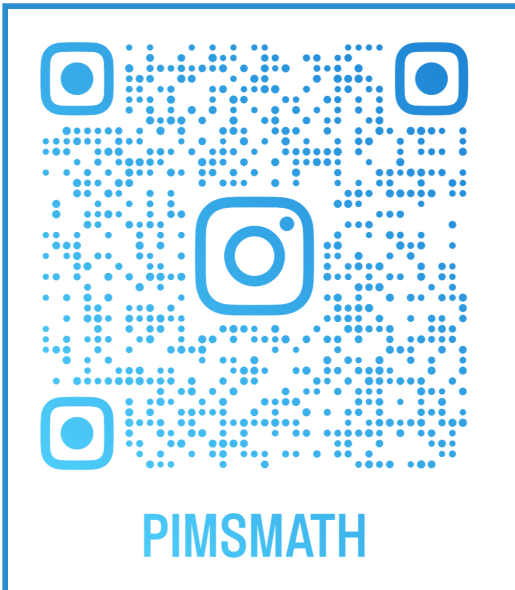
See Application Details

Callysto Call for Proposals Open.

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. The theme for this Call for Proposals is **Developing Responsible Digital Citizens**. Read about our past recipients for proposal ideas and inspiration.

This year, the Callysto call for proposals deadline has been coordinated with the PIMS Education Call for Proposals (see above). Applications with both computational and mathematical
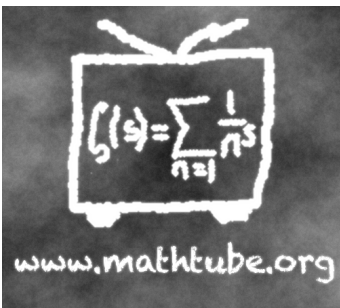
components are encouraged to apply to both programs. **Applications will be accepted as part of a rolling intake until 4:00 pm Mountain Time on February 28, 2023.**

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See Application Details

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MEDIA

PIMSMATH

PIMS is officially on Instagram!

Follow us at @pimsmath to keep in touch with all #PIMS news and math content.

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 any of the CRM-Fields- PIMS Prize Lectures (see below) 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

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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 Səl̓ílwəta?/Selilwitulh (Tsleil-Waututh) Nations.
www.native-land.ca