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Pacific Institute *for the*
Mathematical Sciences

PIMS MONTHLY CONNECTION | **March 2021**



Hello from PIMS

Our March calendar is filling up! We will be hosting **James Watmough** for the [PIMS-UNBC Distinguished Lecture](#) on March 4, and we celebrate scientific leadership at PIMS on **March 8, International Women's Day**. If you have not yet attended the past **PIMS 25th Anniversary Network-Wide Colloquium**, don't miss out on the next lecture from [Lauren Williams on March 11](#). Don't forget to turn your clocks ahead on March 14 (if you are in the Northern Hemisphere) and enjoy the first day of Spring on March 20.

PIMS is looking forward to another year of mathematical excellence as we celebrate our 25th anniversary with our community!

Sincerely,
The PIMS Team

FEATURE EVENTS



[PIMS - UNBC Distinguished Colloquium](#)


March 4: Hosted Online

James Watmough, University of New Brunswick

Case importation and community spread: post-pandemic control of the spread of sARS-CoV-2 in low density populations.


It has been just over one year and 100 million cases since we first heard of a novel coronavirus with pandemic potential. We are now all far too familiar with epidemic curves and would very

much like to see the tail of this one. In this talk, I will review the simple mathematical models for the transition from pandemic to endemic and what they tell us about this tail. For the past year, Canada has kept case numbers relatively low through a combination of community quarantine and travel restrictions. In theory, this has implications for how we approach and manage the new normal of endemic SARS-CoV-2. I will focus on what this might mean for Atlantic Canada.



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PIMS 25th Anniversary Network-Wide Colloquium



Lauren K. Williams, Harvard University
1:30PM Pacific. March 11, 2021
From hopping particles to Macdonald and Schubert polynomials

Online via Zoom:
<https://www.pims.math.ca/scientific/network-colloquium>

[PIMS 25th Anniversary Network-Wide Colloquium](#)

March 11, 1:30PM Pacific Time. Hosted online by PIMS

Lauren Williams, Harvard University

From hopping particles to Macdonald and Schubert polynomials

The asymmetric exclusion process (ASEP) is a model of particles hopping on a one-dimensional lattice. While it was initially introduced by Macdonald-Gibbs-Pipkin to provide a model for translation in protein synthesis, the stationary distribution of the ASEP and its variants has surprising connections to combinatorics. I will explain how the study of the ASEP on a ring leads to new formulas for Macdonald polynomials, a remarkable family of multivariate polynomials which generalize Schur polynomials. In a different direction, the inhomogeneous ASEP on a ring is closely connected to Schubert polynomials, which represent classes of Schubert varieties in the flag variety. This talk is based on joint work with Corteel-Mandelshtam, and joint work with Donghyun Kim.



[Emergent Research: The PIMS Postdoctoral Fellow Seminar](#)

March 17, 9:30AM Pacific Time. Hosted online by PIMS

Peter Kristel, University of Manitoba

The geometry of the spinning string

The development of quantum electrodynamics is one of the major achievements of theoretical physics and mathematics of the 20th century, called the "Jewel of physics" by Richard Feynman. This talk is not about that. Instead, I explain two of its basic ingredients - Feynman diagrams, and Spinor bundles - and then describe how these can be adapted to "electron-like" strings. This will lead us naturally to the Spinor bundle on loop space, which I will describe in some detail. An element of loop space, i.e. a smooth function from the circle into some fixed manifold, is supposed to represent a string at a fixed moment in time. I will then explain the notion of a fusion product (on this bundle), and argue that this is a manifestation of the principle of locality, which is ubiquitous in physics. If time permits, I will discuss some ongoing work, in collaboration with Matthias Ludewig, Darvin Mertsch, and Konrad Waldorf, where we describe how this fusive spinor bundle on loop space fits beautifully in the higher categorical framework of 2-vector bundles.

Click below for all events: March 2021

Scientific

NEWS & ANNOUNCEMENTS

2021 PIMS Education Prize: Nomination Deadline

A prize of \$1,000 will be awarded to a member of the PIMS community who has made a significant contribution to education in the mathematical sciences. This prize is intended to recognize individuals

from the PIMS universities, or other educational institutions in Alberta, British Columbia, Manitoba, Saskatchewan and Washington who have played a major role in encouraging activities which have enhanced public awareness and appreciation of mathematics, as well as fostering communication among various groups and organizations concerned with mathematical training at all levels. **The nomination deadline is March 15, 2021.** More details can be found [here](#).

International Women's Day



Join us on March 8 as we recognize [scientific and administrative leadership](#) on International Women's Day. We thank the many scientists and administrative leaders who collaborate and work with PIMS in various capacities.

Changing the Culture: Registration Open.

Registration is now open for the annual Changing the Culture Conference, organized and sponsored by the Pacific Institute for the Mathematical Sciences. This conference brings together mathematicians, mathematics educators and school teachers from all levels to work together towards narrowing the gap between mathematicians and teachers of mathematics, and between those who do and enjoy mathematics and those who think they don't. This year's meeting will take place on **Friday May 14, 2021**, with a plenary lecture from Math educator, James Tanton. Registration is free and can be done [here](#).

MEDIA



Interview with PIMS Postdoctoral Fellow: Andrew Schopieray, University of Alberta

PIMS 25th Anniversary Network-Wide Colloquium

Feb 11, 2021; 1:30PM PST

Ben Green, University of Oxford
New lower bounds for van der Waerden numbers



Watch it again! Feb 11, 2021- PIMS 25th Network Wide Colloquium with Ben Green

PIMS COMMUNITY RECENT PUBLICATIONS

1. Vatwani, A & Wong, P. 2020. [On generalizations of the Titchmarsh divisor problem](#). Acta Arithmetica 193 , 321-33.
2. Budzinski, T., Curien, N. & Petri, B. (2021). [On the minimal diameter of closed hyperbolic surfaces](#). Duke Mathematics Journal 170 no. 2, 365 - 377.
3. Rayan, S. & Schaposnik, L. (2021). [What is...a hyperolygon?](#) Notices Amer. Math. Soc. 68, no. 1, 94-97.

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**. We are proponents of mathematical **collaboration with industry, innovation in mathematics education** from K-12 to graduate level initiatives, **public outreach and partnerships** with similar organizations around the globe. We fund Collaborative Research Groups, Postdoctoral Fellowships, individual events, and competitive prizes in mathematics.

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