Pacific Institute for the Mathematical Sciences

Emergent Research:
The PIMS Postdoctoral Fellow Seminar

April 28, 2021
9:30 AM Pacific/ 10:30 AM Mountain / 11:30 AM Central
Zoom

PIMS is pleased to present an ongoing lecture series featuring our Postdoctoral Fellows! Every three weeks, you will have the opportunity to connect with emerging research in the mathematical sciences from a PIMS Postdoctoral Fellow. PIMS PDFs are amongst the top young researchers in Canada, and this is an excellent opportunity to learn about them, and their work.

Eric Jones, PhD
PIMS Postdoctoral Fellow - Simon Fraser University

Stochasticity in an ecological model of the microbiome influences the efficacy of simulated bacteriotherapies.

Abstract:

We consider a stochastic bistable two-species generalized Lotka-Volterra model of the microbiome and use it as a testbed to analytically and numerically explore the role of direct (e.g., fecal microbiota transplantation) and indirect (e.g., changes in diet) bacteriotherapies. Two types of noise are included in this model, representing the immigration of bacteria into and within the gut (additive noise) and variations in growth rate associated with the spatially inhomogeneous distribution of resources (multiplicative noise). The efficacy of a bacteriotherapy is determined by comparing the mean first-passage times (the average time required for the system to transition from one basin of attraction to the other) with and without the intervention. Concepts from transition path theory are used to investigate how the role of noise affects these bacteriotherapies.

Speaker Biography:

Eric Jones is a PIMS and Banting Postdoctoral Fellow at SImon Fraser University. He is working with David Sivak (SFU Physics) to explore the role of stochastic fluctuations in ecological models of the microbiome.

REGISTRATION: https://www.pims.math.ca/seminars/PIMSPDF