Emergent Research:
The PIMS Postdoctoral Fellow Seminar

Pacific Institute for the Mathematical Sciences

March 17, 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.

Peter Kristel, PhD
PIMS Postdoctoral Fellow - University of Manitoba

The geometry of the spinning string:

Abstract:
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.

Speaker Biography:
Peter Kristel is a PIMS fellow at the University of Manitoba, working with Derek Krepski and Eric Schippers. He obtained his PhD at the University of Greifswald (Germany) in 2020 under supervision of Konrad Waldorf. He is generally interested in mathematics inspired by physics; in particular, functorial quantum field theory.

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