

# Emergent Research:

The PIMS Postdoctoral Fellow Seminar



Pacific Institute *for the*  
Mathematical Sciences

Apr 12, 2023 | 9:30am Pacific

## Equivalences of Categories of Modules Over Quantum Groups and Vertex Algebras



### Matthew Rupert

PIMS PDF, USaskatchewan

#### SPEAKER BIO:

Matthew Rupert is a PIMS postdoctoral fellow at the University of Saskatchewan under the supervision of Steven Rayan, Alex Weekes, and Curtis Wendlandt. His research interests are in quantum algebra, category theory, and the Kazhdan-Lusztig correspondence for vertex algebras. He obtained his PhD in pure mathematics at the University of Alberta in 2020 under the supervision of Thomas Creutzig, where he studied unrolled quantum groups and their representation theoretic connections to the singlet vertex operator algebras. After completing his PhD, Matthew was a Visiting Assistant Professor at Utah State University from August 2020 to June 2022.

#### ABSTRACT:

Vertex operator algebras are the symmetry algebras of two dimensional conformal field theory. In a famous series of papers, Kazhdan and Lusztig proved an equivalence between particular semisimple categories of modules over affine Lie algebras and quantum groups, the former of which can also be realized as modules over a corresponding vertex operator algebra. Such equivalences between representation categories of vertex operator algebras and quantum groups are now broadly referred to as the Kazhdan-Lusztig correspondence. There has been substantial research interest over the last two decades in understanding the Kazhdan-Lusztig correspondence for vertex operator algebras with non-semisimple representation theory. In this talk I will present an overview of this research area and discuss recent results and future directions.

#### For more information and registration:

<https://www.pims.math.ca/seminars/PIMSPDF>

#### ABOUT PIMS PDF SEMINARS:

PIMS 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.

