

Colloquium

**DEPARTMENT OF
MATHEMATICS & STATISTICS**
University of Michigan-Dearborn

MONDAY, OCTOBER 6TH, 2025

3:45PM - 4:45PM | 2048 CB

**QUANTUM MECHANICS AND
RANDOMNESS**

Speaker: Owen Ekblad



Owen Ekblad is in his sixth and final year of the mathematics PhD program at Michigan State University, and, before that, he did his BA in mathematics at the University of Michigan-Dearborn. He is a mathematical physicist, focusing on building more accurate models of nature by studying the effect of randomness and disorder on quantum mechanical systems.

Abstract

Quantum mechanics (QM) describes nature at the smallest scale, where many surprising physical effects occur: proposals for technology taking advantage of these effects—like quantum computers—have rightfully received much attention in popular media. Mathematically, randomness takes center stage in QM, as captured by the well-known Schrödinger's cat thought experiment: the mere observation of quantum systems leads to outcomes that may only be described in terms of probabilities.

Besides this so-called quantum randomness, additional types of randomness are necessary to describe QM fully. For example, external environmental noise affecting quantum systems is known to be the main obstruction to engineering a useful quantum computer. In this talk, I will give a mathematical description of QM in terms of matrices, explaining some physics on the way, and describe some of my recent work on how randomness affects it all. This talk assumes no background in physics.

Refreshments will be provided!