

HONOURS SEMINAR

Monday, April 8, 2024

1:30 p.m.

AdHum 318

Cody Antal

Lie Groupoids and the Stokes Groupoids

Abstract:

This talk will first introduce the category of groupoids which can be seen as a generalization of the category of groups in which the binary operation is only partially defined. We will then discuss the basic algebraic properties of these objects followed by an informal picture of them as arrows between points in space.

Layne Burns

The Dynamics of Fairness - Revisiting The Peach Stone Bowl Game

Abstract:

In this seminar, we revisit 'The Peach Stone Bowl Game' from a new perspective, questioning the idealized fairness of its components. Through extensive simulation, we examine how altering the probabilities of the stones affects the game's dynamics. Our study and statistical analysis, supported by over a quarter-million simulated games, offers a deeper understanding of the game's probabilistic landscape.

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Peter Wadel

Low-dimensional SIC-POVMs

Abstract:

In continuation of the previous seminar's discussion on symmetric, informationally complete positive operator-valued measures (SIC-POVMs), this talk will focus on exploring several examples of low-dimensional SIC-POVMs and their group-covariant properties.

Jeffery Xu

Fock-Hilbert Spaces and their Operators

Abstract:

The analysis of Fock spaces relies on the operators that live on it just as much as the spaces themselves. In particular, Fock space operators are defined in a similar fashion to the space itself, that of an infinite direct summation of n -tensor product Hilbert space operators, with summation over n . After defining annihilation operators and creation operators, this leads to the fundamental notions of Canonical Commutation Relations (CCR) for symmetric tensor spaces, and Canonical Anticommutation Relations (CAR) for antisymmetric tensor spaces. These are important in the field of quantum field theory (QFT) due to being related to various uncertainty principles.