Categorical Equivalence Between Finitary Orthomodular Dynamic Algebras and Orthomodular Lattices

Juanda Kelana Putra

Masaryk University

Abstract

This talk reveals a categorical equivalence connecting two distinct quantum logic structures. The first is the orthomodular lattice, an algebraic system designed to formalize the properties of quantum systems. The second is a finitary orthomodular dynamic algebra, a specialized development of the orthomodular dynamic algebra where the underlying quantum actions are restricted to be finitary. The applicability of the result extends to more specialized lattices, such as Hilbert lattices of closed subspaces of a Hilbert space, beyond general orthomodular lattices. As these lattice structures exhibit connections to a diverse array of quantum structures, the established equivalence categorically bridges unital involutive m-semilattices with a broad spectrum of quantum formalisms.