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Speaker: Samson Abramsky ;

Title: Categorical Quantum Mechanics: some mathematical aspects

Abstract:

Our starting point is the categorical axiomatics for quantum mechanics recently developed with Bob Coecke. This yields an effective approach to modelling and reasoning about both quantum and classical information flows in entangled quantum systems. This axiomatics also has strong links with a number of topics in algebra, geometry and logic, and opens up some fascinating connections between recent work in Logic and Theoretical Computer Science (Linear Logic, Geometry of Interaction, Traced Monoidal Categories), and in Mathematics and Mathematical Physics (Temperley-Lieb and other diagram algebras, Topological Quantum Field Theories, Quantum groups). I shall discuss some of these connections, which raise many interesting mathematical questions.