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Title: Higher Dagger Categories and Unitary Topological Quantum Field Theory

Abstract: A topological quantum field theory (TQFT) is a symmetric monoidal functor from a bordism category to the category of vector spaces, providing a physical axiomatization of quantum field theories. TQFTs have been studied extensively by topologists, with the goal of providing manifold invariants that are stable under gluing. Extending TQFTs to higher bordism categories enables higher codimension manifold gluing. The physical concept of unitarity in TQFTs can be described using dagger categories. However, the standard definition of dagger categories conflicts with the principle of equivalence, complicating higher-categorical generalizations. In this talk, I define dagger 2-categories to establish a definition of unitary 2-TQFTs. I state a classification result of unitary extended 2-dimensional TQFTs, which suggests a unitary version of the cobordism hypothesis. This is based on joint work with Lukas Müller and many others.