

TFTs and Morita theory for (braided) tensor categories

Adrien Brochier

The Baez-Dolan cobordism hypothesis, now a theorem, provides a dictionary between topological field theories (TFT) and objects in higher categories satisfying strong finiteness condition, generalizing finite-dimensionality for vector spaces. It turns out that many basic notions in representation theory have a natural interpretation in this context. A somewhat familiar example comes from the Morita theory of associative algebra, which can be encoded in a 2-category having algebras as objects, bimodules as morphisms, and morphisms of those as 2-morphisms. Constructions like Hochschild Homology, and properties like semi-simplicity, pop up spontaneously when using this 2-category as a target for TFTs. In this talk, I will explain a joint work with D. Jordan and N. Snyder replacing algebras by tensor and braided tensor categories. This leads to new examples of 3 and 4 dimensional TFTs, and organizes various important categorical structures and properties.