Integral structures in TQFT

Abstract:
The formalism of TQFT (Topological Quantum Field Theory) is a good way to think about quantum invariants in three dimensions, such as the Jones polynomial of classical knots in 3-space, or the Witten-Reshetikhin-Turaev invariants of 3-dimensional manifolds. A crucial fact about these invariants is that in many situations, they are not just arbitrary complex numbers, but algebraic integers. This fact leads to a notion of integral structure on the whole TQFT, which I have developed in joint work with Pat Gilmer. In my talk, I will try to give a non-technical introduction to this theory, mainly by discussing some of its applications to 3-manifold topology and to questions about mapping class groups of surfaces.

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