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Title: Towards knot homology for 3-manifolds

Abstract: The Jones polynomial is an invariant of knots in $\mathbb{R}^3$. Following a proposal of Witten, it was extended to knots in 3-manifolds by Reshetikhin--Turaev using quantum groups.

Khovanov homology is a categorification of the Jones polynomial of a knot in $\mathbb{R}^3$, analogously to how ordinary homology is a categorification of the Euler characteristic of a space. It is a major open problem to extend Khovanov homology to knots in 3-manifolds.

In this talk, I will explain forthcoming work towards solving this problem, joint with Leon Liu, David Reutter, Catharina Stroppel, and Paul Wedrich. Roughly speaking, our contribution amounts to the first instance of a braiding on 2-representations of a categorified quantum group. More precisely, we construct a braided $(\infty,2)$-category that simultaneously incorporates all of Rouquier's braid group actions on Hecke categories in type A, articulating a novel compatibility among them.