

A QUASI-LOCAL APPROACH TO LINK HOMOLOGY

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In 1999, Khovanov introduced a bigraded homology theory associated to oriented links in R^3 , which recovers the Jones polynomial upon taking Euler characteristic. One of the most important features of Khovanov homology is its 4-dimensional aspect, namely functoriality under 4-dimensional link cobordisms. Since Khovanov's seminal work, numerous categorifications of other Reshetikhin-Turaev link invariants have been constructed. In contrast with Khovanov homology, many of these link homologies either fail to be functorial or fail to be local (extend to tangles).

In this talk I will focus on the case of the colored Jones polynomial and the problems with functoriality of its categorifications. I will then discuss how a categorical analogue of clearing denominators produces a new, related link homology theory which seems likely to be functorial. During the process, Jones-Wenzl idempotents will be traded for quasi-idempotents, which is the origin of the term "quasi-local". The new theory categorifies a (well-understood) scalar multiple of the colored Jones polynomial.

I will not assume familiarity with Khovanov homology, and as a result will stress qualitative properties of the invariants, rather than the precise constructions.

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