Cocenter of the Soergel category

Matt Hogancamp, Northeastern University

Recall that the cocenter of an algebra A is the algebra modulo commutators. It is well known that the direct sum of cocenters of symmetric group algebras Q[S_n] forms an algebra isomorphic to the ring of symmetric functions in infinitely many variables. There is a q-deformation of this fact: the direct sum of cocenters of type A Hecke algebras forms an algebra isomorphic to the ring of symmetric functions with an additional formal parameter q.

In this talk I will discuss a categorification of this fact, in which the Hecke algebra gets replaced by the category of Soergel bimodules. First I will present an explicit dg model for the categorical cocenter of an arbitrary (dg) monoidal category. Miraculously, the cocenters of Hecke categories can be calculated (in type A, anyway) as the derived categories of explicit wreath product algebras. Finally, I plan to sketch how this gives rise to a well-behaved notion of Khovanov-Rozansky link homology for links in a solid torus (which was the primary motivation for this work). This is joint with Eugene Gorsky and Paul Wedrich.