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Hall algebras and skein theory

The Hall algebra of an abelian category is spanned by isomorphism classes of objects, with the multiplication defined by "counting extensions." Skein algebras of surfaces are spanned by links in a thickened surface, with multiplication defined by stacking. We discuss a result that the skein algebra of the torus is isomorphic to the Hall algebra of an elliptic curve. In light of homological mirror symmetry, this work motivates the study of the Hall algebras of Fukaya categories of surfaces, which will be discussed further in Ben Cooper's talk. (joint with H. Morton and B. Cooper)