

Introduction to Soergel bimodules

Ben Elias, University of Oregon

Soergel bimodules are in the title of this workshop, so we thought it would be nice if all the attendees got a chance to learn what they are (at least in type A). This talk will begin by motivating the Hecke algebra and its categorification using Schur-Weyl duality, explaining how one obtains knot invariants from representation theory and categorical representation theory. Then I will focus on Soergel bimodules themselves, one of the most approachable categorifications of the Hecke algebra. They are a particular kind of bimodule over a polynomial ring, defined by inducing and restricting between subrings of partially invariant polynomials. I'll explain the basics of the theory, and how one constructs a categorification of the braid group using complexes of Soergel bimodules.