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Title: Knots, Graphs and Lattices

Abstract: In a 2011 breakthrough, Greene uses the "Tait graph" construction for knots, and a lattice-valued invariant of graphs, to prove that the Heegaard-Floer homology of the double branched cover is a complete mutation invariant of alternating knots. I will describe our recent work generalising this construction to knots on surfaces, and showing - by counterexample - that the analogous invariant is not complete up to mutation. I will give brief summary of the computational methods used - which are interesting in their own right - and end with a list of open questions. This talk is based on joint work with Hans Boden, Damian Lin and Tilda Wilkinson-Finch.