The Temperley-Lieb Algebras of Types A and B and Their Corresponding Diagram Algebras

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Abstract: The Temperley–Lieb Algebra, invented by Temperley and Lieb in 1971, is a certain finite dimensional associative algebra, which arose in the context of statistical mechanics. Later in 1971, Roger Penrose showed that this algebra can be realized as a certain diagram algebra. Then in 1987, V.F.R. Jones showed that the Temperley–Lieb Algebra occurs naturally as a quotient of the Hecke algebra arising from a Coxeter system of type A (whose underlying group is the symmetric group). Eventually, this realization of the Temperley–Lieb Algebra as a Hecke algebra quotient was generalized to the case of an arbitrary Coxeter system. In this talk, we will introduce the diagram algebras corresponding to the Temperley-Lieb Algebras of Coxeter types A and B. At the end of the talk, I will briefly discuss my current research on the Temperley–Lieb Algebra of type $\widetilde{C}$. This all sounds complicated, but I'll only assume that you know some basics about groups and vector spaces.