

Title: Searching for invariants for graphs

Abstract: Two knots (or graphs) are considered equivalent if one can be transformed into the other via a type of deformation of R^3 upon itself. A basic problem of knot theory (or graph theory) is to distinguish between two equivalent knots (or graphs). A useful tool for this recognition problem consists of knot/graph invariants, which are quantities that are the same for equivalent knots/graphs.

The scope of this talk is to construct invariants for trivalent graphs embedded in R^3 . The first invariant that we will consider is a polynomial invariant which holds only for trivalent graphs whose third of the edges are considered rigid, and it arises from a state model for the 2-variable Kauffman polynomial for knots and links. This was recently constructed by the speaker, in collaboration with James Tipton, a former Fresno State math major. But one should wish for an honest invariant, namely an invariant that deals with topological graphs. So we will discuss ways for improving this polynomial invariant and, also, another idea that we believe will yield an honest numerical invariant for topological trivalent graphs.