

1154-57-1353

Scott Baldridge* (sbaldrid@math.lsu.edu), Department of Mathematics, Baton Rouge, LA 70803. *A new cohomology for planar trivalent graphs with perfect matchings*. Preliminary report.

In this lecture, I will describe a simple-to-compute polynomial invariant of a planar trivalent graph with a perfect matching (think: Jones polynomial for graphs). This polynomial when evaluated at 1 counts the number of 3-edge colorings of the graph that has the same color for all the perfect matching edges. (If the count is non-zero, it implies the map is 4-colorable.) I will then discuss how to categorify this polynomial to get a Khovanov-like cohomology theory for planar trivalent graphs. This is the first “TQFT” for graphs that gives combinatorial information instead of topological invariants. (Received September 15, 2019)