

On generalized graphs, polynomial invariants and Brauer algebra

The Bollobas-Riordan polynomial [Math. Ann. 323, 81 (2002)] is a universal polynomial invariant for ribbon graphs. A new class of graphs called stranded graphs arise in the study of tensor models for quantum gravity in physics, and is a generalization of graphs and ribbon graphs. Then a seven-variable polynomial invariant [Sigma. 12 (2016), 030] of these graphs which obeys a contraction/deletion recursion relation similar to that of the Tutte and Bollobas-Riordan polynomials has been found. Recently the study of the quiver of ribbon graphs and of their Brauer algebra receive much attention [arxiv:1608.00321[math.RT]]. From a particular class of ribbon quivers called triangulation quiver, a new class of algebra of tame representation type called triangulation algebra has been discovered. We hope that these results will find an extension to the new class of combinatorial objects called rank D weakly-colored stranded graphs.

This is an outgoing work with V. Futorny, K. Iusenko and A. Sierra.