Session: Identities in combinatorial monoids

Identities of plactic-like monoids via tropical representations

Marianne Johnson[1],

[1] University of Manchester

Finite rank plactic monoids are infinite monoids arising from a natural combinatorial multiplication (determined by Schensted's insertion algorithm) on semistandard tableaux over a fixed finite alphabet. Each finite rank plactic monoid can be faithfully represented by matrices over the tropical semiring; the existence of such representations implies that these monoids satisfy non-trivial semigroup identities (joint work with Kambites).

There are several well-studied families of finite rank 'plactic-like' monoids whose elements are combinatorial gadgets of a particular type over a fixed finite alphabet, and whose multiplication can be defined by means of an insertion algorithm. It turns out that most of these well-studied families can be faithfully represented by matrices over semirings from a large class (including the tropical semiring). Using our representations, we prove some results about the varieties generated by various plactic-like monoids (joint work with Cain, Kambites and Malheiro).