

1086-05-1409

Mark Dukes* (mark.dukes@strath.ac.uk), University of Strathclyde, United Kingdom, and
Yvan Le Borgne (borgne@labri.fr), CNRS, LaBRI, University Bordeaux 1, Bordeaux, France.
Parallelogram polyominoes, the sandpile model on $K_{m,n}$ and a q, t -Narayana polynomial.

In this talk I will highlight some results from a recent paper ([arXiv:1208.0024](https://arxiv.org/abs/1208.0024)) that was motivated by a correspondence between bivincular patterns and composition matrices. We classify recurrent configurations of the sandpile model on the complete bipartite graph $K_{m,n}$ in terms of polyominoes. A canonical toppling process on these recurrent states gives rise to a *bounce* path within the corresponding polyomino. This bounce path, in turn, gives rise to a polynomial that we call the q, t -Narayana polynomial. We discuss this q, t -Narayana polynomial and its relation to the well-known q, t -Catalan polynomial. The specialization to the original correspondence between bivincular patterns and a sub-collection of recurrent configurations will also be touched upon. (Received September 21, 2012)