

Workshop on Combinatorial Hopf Algebras
and Macdonald Polynomials

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Tableaux, Puzzles, and Mosaics

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Abstract

There are several well known combinatorial rules for computing Littlewood-Richardson numbers. I will talk about two of the main ones: the original rule of Littlewood and Richardson, which is phrased in terms of tableaux, and the Knutson-Tao “puzzle rule”, which looks very different. Most every other known rule is just a variant on one or the other. Yet it is not immediately obvious why these two are rules are the same, or why they are correct. I will give a new construction—mosaics—which interpolates between puzzles and tableaux. Then a miracle will occur: just using the fact that one can interpolate between them, a new and pleasant proof of correctness (for both rules) will appear out of thin air.