

Combinatorial actions and homomesic orbit averages

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008 Kemeny (!), 4:00PM

(3:30 Tea, 300 Kemeny)

Abstract

We consider a variety of combinatorial actions on finite sets which have interesting unexpected properties. Starting with simple examples such as cyclic rotation of binary strings, we generalize to actions on Young tableaux and order ideals of other partially ordered sets. We identify a particular phenomenon called “homomesy” appearing in many unrelated combinatorial contexts: namely that the average value of some natural statistic over each orbit is the same as the average over the entire set. Viewing these actions as products of “toggle operations” allows us to see how some of these actions are related and to extend much of this picture more broadly to interesting non-combinatorial actions, such as a piece-wise linear action on the order polytope of a poset.

This talk largely discusses recent work with Jim Propp, including ideas and results from Arkady Berenstein, David Einstein, Shahrzad Haddadan, Jessica Striker, and Nathan Williams.

This talk should be accessible to graduate students.