

“Group Theory International” Online Seminar

Benjamin Steinberg

(City College of New York, CUNY)

“Hyperplane arrangements, flag complexes and monoid cohomology”

Thursday, May 9, noon (New York Time)

Abstract:

Bidigare, Hanlon and Rockmore exploited the Tits multiplication on the faces of a hyperplane arrangement to analyze a number of Markov chains. This was further studied by Ken Brown and Diaconis, and then generalized to complex hyperplane arrangements by Anders Bjorner. Ken Brown realized that in fact a number of combinatorial structures admit a monoid operation making them LRBs and developed a theory of random walks on LRB monoids.

An LRB has a natural poset structure and in this talk we connect the topology of this poset structure (geometrically realized as a simplicial complex) with the cohomology of the LRB. Moreover, we construct for each flag complex an LRB whose cohomological dimension is the Leray number of that flag complex. The Leray number is an invariant that arises in the study of Stanley-Reisner rings and Helly theorems.

The talk will mostly consist of illustrative examples. No knowledge of monoid theory required. This is joint work with Stuart Margolis and Franco Saliola

Next presentation: **TBA**