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Stanley-Reisner Rings of Symmetric Simplicial Complexes

Abstract for the Combinatorics Seminar 2019 January 29

A classical theme in algebraic combinatorics is the study of face rings of finite simplicial complexes (named after Stanley and Reisner, two of the pioneers of this field). In this talk I will examine the case where the simplicial complexes at hand carry a group action and are allowed to be infinite.

I will present the foundations of this generalized theory with a special focus on simplicial complexes associated to (semi)matroids, where the associated rings enjoy especially nice algebraic properties. A main motivation for our work comes from the theory of arrangements in Abelian Lie groups (e.g., toric and elliptic arrangements), and in particular from the quest of understanding numerical properties of the coefficients of characteristic polynomials and h-polynomials of arithmetic matroids. I will describe our current results in this direction and, time permitting, I will outline some open questions that arise in this new framework.

This is joint work with Alessio D'Alì.

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