Abelian reflection arrangements (in the guise of... a stepping stone)

Emanuele Delucchi

SUPSI - University of applied arts and sciences of Southern Switzerland

Hyperplane arrangements associated to reflection groups have a well-deserved reputation as a key source of inspiration for results with a broad reach in combinatorics, topology and algebra. To name two examples: several theorems on geometric lattices (i.e., matroids) are generalisations of familiar properties of posets of partitions, and Brieskorn's K(\pi,1)-conjectures spurred an array of results related to asphericity of spaces with combinatorial structure.

In this talk I will illustrate how, even in the broader setting of arrangements of hypersurfaces, "the Coxeter case" remains an all-important stepping stone. I will start by reviewing the basics about arrangements in connected Abelian Lie groups (including toric and elliptic arrangements). Then, I will survey some recent results on Coxeter arrangements and, more generally, on the combinatorial theory and the K(pi,1) problem for Abelian arrangements.

(This includes joint work with C. Bibby, A. D'Alì, N. Girard, G. Paolini, S. Riedel)