Oberseminar zur Algebra und Algebraischen Kombinatorik

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Enumerative study of discriminantal arrangements

(Joint work with Benoît Guerville-Ballé, Anatoly Libgober and Simona Settepanella)

The *Discrimantal arrangement*, introduced by Manin and Schechtman in 1989, is an arrangement of hyperplanes generalizing the classical braid arrangement. Discrimantal arrangements $MS(n,k,\mathcal{A})$ can be defined as follows. Consider a generic hyperplane arrangement $\mathcal{A} = \{H_1, \ldots, H_n\}$ in $\mathbb{K}^k$ (with $\mathbb{K}$ equal $\mathbb{R}$ or $\mathbb{C}$), then $MS(n,k,\mathcal{A})$ is the set of parallel translates $H_1^{t_1}, \ldots, H_n^{t_n}$, with $(t_1, \ldots, t_n) \in \mathbb{K}^n$, which fail to form a general position arrangement in $\mathbb{K}^k$. It can be viewed as an arrangement of $\binom{n}{k+1}$ hyperplanes in $\mathbb{K}^n$. The purpose of this work in progress is to study the topological invariants of the Manin Schechtmann arrangements $MS(n,k,\mathcal{A})$.

If the arrangement $\mathcal{A}$ is generic enough then the intersection lattice of $MS(n,k,\mathcal{A})$ is independent of $\mathcal{A}$. Such arrangements are called very generic arrangements, and denoted by $MS(n,k)$. In this particular case, the intersection lattice of $MS(n,k)$ has been explicitly described by Athanasiadis. In this talk, we adress the problem of calculating the Betti numbers (respectively the number of connected components or chambers) of the complement to $MS(n,k)$ in the case $\mathbb{K} = \mathbb{C}$ (resp. $\mathbb{K} = \mathbb{R}$). We develop combinatorial formulas for the Betti numbers and the numbers of chambers for the complements. These formulas will allow us to develop overall picture of the topology of the complements by obtaining asymptotic formulas for the Betti numbers and the number of chambers of $MS(n,k)$ when n grows.

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ab 14:15 Uhr, Raum a410

Hauptgebäude der Leibniz Universität Hannover

Alle Interessierten sind herzlich eingeladen.

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