New Perspectives in Hyperplane Arrangements
Bochum, September 10-14, 2018

Abstracts Conference Speakers

Takuro Abe (Kyushu University)

The b_2-equality and free arrangements

Terao's famous addition, deletion and restriction theorems have been used to check freeness and construct free arrangements. The key of them is to consider the pair of arrangements and the freeness like the deletion-restriction formula. Since we have Terao's factorization theorem, the condition of the addition, deletion and restriction theorems restricts the Betti numbers of the original arrangement, deleted and restricted one. One of the peculiar one is called the b_2-inequality. When this is equal, we can get several information on their logarithmic derivation modules. Following Yoshinaga's talk, we explain the recent developments around the b_2-equality.

Nils Amend (Leibniz Universität Hannover)

Restrictions of Arrangements and Asphericity

We will discuss asphericity of restrictions of arrangements concentrating on reflection arrangements and certain subarrangements called ideal arrangements. We prove that the infinite families of reflection arrangements admit aspherical restrictions whereas the latter yield two (real) families of aspherical arrangements that admit restrictions which are not aspherical. These seem to be the first known instances of this phenomenon.

This is joint work with Tilman Möller and Gerhard Röhrle.

Pauline Bailet (Leibniz Universität Hannover)

A vanishing result for the first twisted cohomology of affine varieties and applications to line arrangements

Let S be a smooth proper complex variety of dimension ≥ 2 and $D = \sum_{i=1}^{n} D_i$ a divisor on S (D_i irreducible). Consider a rank one local system $\mathcal{L}$ on $U = S \setminus D$, with monodromy $t_i \in C^\times$ around D_i. We give a general vanishing result for the first twisted cohomology group $H^1(U, \mathcal{L})$, generalizing a result due to Cohen-Dimca-Orlik. Then we give some applications in the context of hyperplane arrangement, namely local system cohomology of line arrangement complements.

This is joint work with A. Dimca and M. Yoshinaga.

Eva-Maria Feichtner (Universität Bremen)

Wonderful arrangement compactifications

We will review the seminal construction of wonderful arrangement compactifications by DeConcini and Procesi from the mid 90's and discuss connections to toric and tropical geometry as they emerged over the years.

Christian Stump (TU Berlin)

What are logarithmic vector fields on complex reflection arrangements?

I define vector fields with logarithmic poles for general finite complex arrangements and discuss its properties in the case of reflection arrangements of well-generated reflection groups. I discuss an explicit basis for this module of logarithmic vector fields, based on a "universality property" provided by a recently described flat connection on its discriminant hypersurface. This yields in particular a Hodge filtration of this module of logarithmic vector fields.

Based on joint work with T. Abe, G. Röhrle and M. Yoshinaga.