

HYPERPLANE ARRANGEMENTS AND RELATED TOPICS

ABSTRACTS OF TALKS

NICE, 6 March 2012

- **Denis Ibadula: Special weighted polynomials in positive characteristic, the Igusa local zeta function and beyond.**

A special class of weighted polynomials, the so called hybrid polynomials, have been introduced by Hauser in 2010, in "On the problem of resolution of singularities in positive characteristic (or: A proof we are still waiting for)", Bulletin of the American Math. Soc. 47, 1, 2010, 1-30. They describe completely the singularities in characteristic p where the characteristic zero proof of the embedded resolution of singularities fails. This makes them very interesting for calculating the Igusa zeta function, since an embedded resolution of singularities is often used to prove the rationality and to find the poles.

This is a joint work with Dirk Segers (Katholieke Universiteit Leuven) and Edwin Leon Cardenal (Cinvestav, Queretaro, Mexico).

- **Anca Macinic: Graphic arrangements, combinatorial computations and monodromy action on the Milnor fiber**

We compute certain modulo p Aomoto complexes of graphic arrangements of type A , computations that help us analyze the monodromy action, over the rationals, on the first homology group of the Milnor fiber associated to the arrangement. We prove that the monodromy action is combinatorially determined, in the above setting.

• **Simona Settepanella: Cohomology of generalized pure braid groups and of Milnor fibres of reflection arrangements.**

Let (W, S) be a finite Coxeter system in \mathbb{R}^n , $A(W)$ the arrangement in \mathbb{C}^n obtained by complexifying the reflection hyperplanes of W and $Y(W)$ the complement in \mathbb{C}^n .

Then W acts freely on $Y(W)$ and the fundamental group $P(W)$ of $Y(W)$ is the pure Artin group. These groups occur in many different problems. The integer cohomology of the Artin groups associated to finite Coxeter groups is well known and so is the integer cohomology of the complement $Y(W)$, which is completely described from the Orlik-Solomon Algebra.

In this talk we are going to consider the cohomology of the pure Artin groups $P(W)$ with coefficients in the module R_t given by the action over the ring $R = \mathbb{Q}[t, t^{-1}]$ of rational Laurent polynomials in the variable t , defined by mapping each standard generator to the operator of multiplication by $-t$. This cohomology corresponds to the cohomology of the complement $Y(W)$ with the same coefficients and to the cohomology (shifted by 1) with rational coefficients \mathbb{Q} of the Milnor fibre $F(W)$ associated to the arrangement $A(W)$.

In order to deal with this cohomology, we will introduce some well known results about the global Milnor fibre $F(W)$ of a complement $Y(W)$ and the Salvetti's CW-complex. Thanks to these tools we can provide a "stability" theorem for the cohomology rings of pure Artin groups of the series A_n, B_n, D_n and the exact computations for the exceptional cases $I_2(n), H_3, H_4$ and F_4 .

• **Jean Vallès: Freeness of line arrangements**

We describe the logarithmic bundle associated to a arrangement of lines in $\mathbb{P}^2(\mathbb{C})$ as the image of the ideal sheaf of its dual set of points in $\mathbb{P}^{2V}(\mathbb{C})$ by the Fourier-Mukai transform. This bundle is said to be free when it splits as a sum of two line bundles. Terao conjectures (in 1981) that the freeness of this bundle depends only on the combinatorics of the arrangement of lines. Thanks to this new description, we recover all the known results and moreover we give a list of new cases such that the Terao's conjecture is true. This is a joint work with D. Faenzi.

organizer: A. Dimca