

# JOURNÉES DE GÉOMÉTRIE ALGÈBRE AFFINE

GRENOBLE - May 9-10 2011

## SCHEDULE

Monday from 9h00, Coffe room :

Coffee, tea

Monday 9h30-10h30, Salle 04 :

### Flexible varieties and Cox rings

*Ivan ARZHANTSEV (Moscow University)*

**Abstract :** The Cox ring of an algebraic variety  $X$  is a useful invariant which may be applied, in particular, to the study of the automorphism group  $\text{Aut}(X)$ . In this way D.Cox (1995) gave a description of the automorphism group of a complete simplicial toric variety. In a joint paper with S.Gaifullin we find all toric varieties with a transitive action of a semisimple algebraic group  $G$ .

The second part of the talk is based on a joint work with H.Flenner, S.Kaliman, F.Kutzschebauch and M.Zaidenberg. Let us say that an affine variety  $X$  is flexible if the tangent space at any smooth point on  $X$  is generated by sections of locally nilpotent vector fields. Suppose that  $\dim X > 1$ . We prove that flexibility implies that the action of the group of special automorphisms on the smooth locus of  $X$  is infinitely transitive. Clearly, every affine homogeneous space of a semisimple group  $G$  is flexible. Assume now that  $G$  acts on an affine variety  $X$  with an open orbit. We show that  $X$  is flexible provided it is smooth. Moreover, using a description of the Cox ring of a normal affine  $\text{SL}(2)$ -embedding due to V.Batyrev and F.Haddad (2008), we prove flexibility for arbitrary  $X$  and  $G = \text{SL}(2)$ .

Monday 10h30-11h30, Salle 04 :

### The tame and the wild automorphisms of an affine quadric threefold

*Stéphane VÉNÉREAU (Universität Basel)*

**Abstract :** We prove the existence of wild automorphisms on an affine quadric threefold. The method we use is an adaptation of the one used by Shestakov and Umirbaev to prove the existence of wild automorphisms on the affine three dimensional space. This is a joint work with S.Lamy.

Monday 14h00-15h00, Salle 04 :

### On $\mathbb{G}_a$ and $\mathbb{G}_a^2$ actions on complements of hypersurfaces in $\mathbb{P}^n$

*Takashi KISHIMOTO (Saitama University)*

Monday 15h30-16h30, Salle 04 :

### On finite subgroups of the space Cremona group

*Yuri PROKHOROV (Moscow University)*

**Abstract :** We discuss recent progress in classification of finite subgroups of the Cremona group  $Cr_3(\mathbb{C})$ .

Tuesday 9h00-10h00, Salle 04 :

**Sur les cônes associés aux problèmes de branchement**

*Nicolas RESSAYRE (Université de Montpellier)*

**Abstract :** Soit  $H \subset G$  un groupe et un sous-groupe, tous deux complexes connexes et réductifs. Soit  $V_G$  une représentation irréductible de  $G$ . C'est aussi une représentation de  $H$  qui n'est plus irréductible en général mais est une somme d'irréductibles. L'étude des multiplicités correspondantes à cette décomposition est un sujet classique en théorie des représentations. Nous décrirons le cône convexe engendré par le semi-groupe des paires de poids correspondantes aux multiplicités non nulles (dont un exemple est celui de Horn). Nous exposerons aussi quelques résultats reliés.

Tuesday 10h30-11h30, Salle 04 :

**Affine spherical varieties and antiholomorphic involutions**

*Dmitri AKHIEZER (IPPI, Moscou)*

**Abstract :** It is known that a toric variety possesses a canonical real structure. A similar structure exists for non-singular affine spherical varieties. The structure is given by an antiholomorphic involution of the variety, equivariant with respect to the involutive antiholomorphic automorphism of the reductive transformation group that defines the split real form. We will sketch the proof of existence of such a real structure and discuss some applications to geometric representation theory.

Tuesday 13h30-14h30, Salle 04 :

**The density property for complex manifolds - examples and applications**

*Frank KUTZSCHEBAUCH (Universität Bern)*

**Abstract :** The density property for complex manifolds is a way of saying the manifold has a large group of holomorphic automorphisms. It allows in the case of Stein manifolds to approximate local injective maps by (global) automorphisms. We will explain the last statement more precisely. Then we survey the numerous applications of it. Also we survey examples of Stein manifolds known to have that property.

Tuesday 15h00-16h00, Salle 04 :

Soutenance de Thèse de Doctorat :

**Actions de groupes algébriques sur des variétés affines et la normalité d'adhérences d'orbites**

*Karine KUYUMZHIYAN (Institut Fourier)*