

Algèbre, Rencontres Grenoble/Lyon/Saint-Étienne

Villeurbanne (ICJ, bâtiment Braconnier)

Le 23 juin 2017, salle Fokko du Cloux

10h-11h : Shrawan KUMAR (Université de Caroline du Nord)

*Positivity in T -equivariant K -theory of flag varieties
associated to Kac-Moody groups*

Abstract : We prove sign-alternation of the structure constants in the basis of structure sheaves of opposite Schubert varieties in the torus-equivariant Grothendieck group of coherent sheaves on the flag varieties G/P associated to an arbitrary symmetrizable Kac-Moody group G , where P is any parabolic subgroup. This generalizes the work of Brion and Anderson-Griffeth-Miller from the finite case to the general Kac-Moody case, and affirmatively answers a conjecture of Lam-Schilling-Shimozono regarding the signs of the structure constants in the case of the affine Grassmannian.

We also prove the sign-alternation of the structure constants in the basis of dualizing sheaves of opposite Schubert varieties in the torus-equivariant Grothendieck group of coherent sheaves on the full flag variety G/B associated to any symmetrizable Kac-Moody group G . Part of this work is done jointly with my student Seth Baldwin.

11h30-12h30 : Sebastien BOUCKSOM (CNRS, École Polytechnique)

Determinant of cohomology and transfinite diameter on Berkovich spaces

Résumé : I will present a joint work with Dennis Eriksson, in which the Knudsen-Mumford expansion of the determinant of cohomology over the valuation ring of complete non-Archimedean field is used to define and study the transfinite diameter and the related notion of Fekete points in this setting.

14h15-15h15 : Raman PARIMALA (Université Emory, Atlanta)

Serre's injectivity question for torsors and beyond

Résumé : Serre raised the question whether a principal homogeneous space under a connected linear algebraic group admits a rational point if it admits a zero cycle of degree one. We discuss the status of this conjecture as well

as more general questions due to Totaro for the existence of closed points of degree equal to the index of the space.

15h45-16h45 : Vyacheslav FUTORNY (Université de São Paulo)
Gelfand-Tsetlin modules for $\mathfrak{gl}(n)$

Abstract : We will discuss a construction of a family of infinite-dimensional Gelfand-Tsetlin modules over the Lie algebra $\mathfrak{gl}(n)$ generalizing a classical construction of finite dimensional modules by Gelfand and Tsetlin. We propose an effective method of constructing explicitly family of irreducible $\mathfrak{gl}(n)$ -modules (conjecturally all) that have a basis consisting of Gelfand-Tsetlin tableaux which are eigenvectors for the Gelfand-Tsetlin commutative sub-algebra, and the action of the Lie algebra is given by the Gelfand-Tsetlin formulas. The talk is based on joint results with Luis Enrique Ramirez and Jian Zhang.

17h-18h : Simon RICHE (CNRS, Clermont-Ferrand)

*On the Humphreys conjecture on support varieties
of tilting modules for reductive groups*

Résumé : If G is a reductive algebraic group over a field of positive characteristic, to any G -module M one can associate the support variety $V(M)$, a closed subvariety of the nilpotent cone of G . A conjecture by Humphreys predicts that, in case M is a tilting module, this subvariety is the closure of a nilpotent G -orbit, determined by the right cell in the affine Weyl group to which the element corresponding to the alcove containing the highest weight of M belongs. An analogue of this conjecture for Lusztig's quantum groups at a root of unity was proved by Bezrukavnikov in the early 2000's, but the case of reductive groups remains open (except in type A). In this talk I will present some recent progress on this conjecture, obtained as a joint work with Pramod Achar and William Hardesty, which leads in particular to a proof for rank 2 groups and for a general group in large characteristic.