ABSTRACTS

Arkady Berenstein, *From geometric crystals to crystal bases*

The goal of my talk is to construct crystal bases in irreducible G-modules by means of geometric crystals that have been introduced a few years ago in a joint work with David Kazhdan. Geometric crystals provide a family of piecewise-linear parametrizations of crystals bases and allow for defining such combinatorial structures as 'crystal multiplication' and 'central charge' on tensor products of crystal bases.

Roman Bezrukavnikov, *Non-restricted representations and coherent sheaves: from positive to zero characteristic*

Our joint work with Mirkovic and Rumynin identifies the category of non-restricted modules over a semi-simple Lie algebra in characteristic p (with a fixed infenitesimal central character) with a subcategory in the derived category of coherent sheaves on the formal neighborhood of the corresponding Springer fiber. I will discuss ways to show that this subcategory is in a sense independent of p.

Benjamin Enriquez, *Quasi-reflection algebras and special values of multiple polylogarithm*

We study the holonomy of a trigonometric analogue of the Knizhnik-Zamolodchikov equation (on $\mathbb{P}^1 - \{0, \infty\} \cup \mu_N(\mathbb{C})$). It is a generating series for values of multiple polylogarithms at Nth roots of 1, and it satisfies relations generalizing those satisfied by Drinfeld's KZ associator. We then develop the analogue of Drinfeld's theories of associators and the GT group.

Michael Finkleberg, *Quantum $sl(n)$ action in the equivariant K-theory of Laumon spaces*

G.Laumon has introduced a smooth compactification of the moduli space of maps from the projective line to the flag variety of SL_n. There are natural correspondences between the Laumon spaces, and they are equipped with the natural line bundles. They give rise to the operators in the equivariant K-theory of Laumon spaces, which generate the action of the quantum group $U_q(sl_n)$. The resulting module is the universal Verma module, with a specific basis. These results have an affine analogue, where the Laumon spaces are replaced by the moduli spaces of torsion-free parabolic sheaves on $P^1 \times P^1$. These constructions have potential applications to the computation of equivariant quantum K-theory of the flag variety of (affine) SL_n. The work is joint with A.Braverman and A.Kuznetsov.

Victor Kac, *Non-linear algebras*

By a non-linear algebra I mean an algebra where also non-linear terms are allowed, for example [e,f]=G(h), where G is a polynomial. I will discuss two settings: non-linear Lie algebras (easy, QM setting), and non-linear Lie conformal algebras (much more difficult, QFT setting). The latter case provides a rigorous framework for what physicists call W-algebras.

Kobi Kremnizer, *D-modules on the quantum flag variety*

The quantum flag variety is an example of a noncommutative space. I will describe how to think of it using the equivariant language, and I will show that it is a noncommutative projective variety. The category of D-modules over this variety will be described. For generic q I will show that this category is equivalent to the category of modules over the finite part of the quantum group. This work attempts to understand A. Joseph's work in the language of noncommutative geometry. It is joint work with E. Backelin.

Gioan Pagnon, *The Springer fiber of type A*

The study of the nilpotent cone of a Lie algebra found its great motivation in 1970 thanks to Brieskorn which established a first bridge between the rational double points of a surfaces and the complex simple Lie algebras. In 1975 H. Esnault showed again this connection while passing by the Springer Resolution which was obtained by this last in 1968. Spaltenstein and Steinberg highlight a bijection between the irreducible components of the of Springer fiber and the standard tableaux. While basing itself on this correspondence we will present a few properties relating to the Springer fiber.

Vadim Voloogodsky, *On limit motives*

Let A be a regular local ring of dimension 1 with the maximal ideal m, and let K (resp. by k) denote its fraction (resp. residue) field. Fix a nonzero vector $\tau \in m/m^2$. Let X be a smooth proper scheme over $specK$. Assume that X has a semistabe model over $specA$.

We will explain a construction of the limit motive X_∞ over $speck$ ("motive" is understood as an element of the triangulated category introduced by Voevodsky). The motive X_∞ comes together with the monodromy operator: $N : X_\infty \to X_\infty(1)$. The construction is compatible with the etale and Hodge realization.