Program - Categorification : Hecke algebras, finite groups and quantum groups

Representation Theory

IHP 23-27 March 2020

- R. Bezrukavnikov (MIT)

  TBA

  Abstract:

- C. Bonnafé (CNRS)

  Translation by the full twist and Deligne-Lusztig varieties

  Abstract: (Joint work with O. Dudas and R. Rouquier.) We explain the proof of a conjecture of Digne-Michel-Rouquier about the behaviour of the cohomology of Deligne-Lusztig varieties with respect to translation by the full twist. Using previous results of O. Dudas, this implies Broué-Michel's conjecture for $GL(n,q)$ on the disjointness of the cohomology for the variety associated to any good regular element. That conjecture was inspired by Broué's abelian defect group conjecture and the specific form Broué conjectured for finite groups of Lie type.

- C. Chari (UC Riverside)

  TBA

  Abstract: TBA

- M. Kapranov (Kavli Institute for Physics and Mathematics of the universe, Chiba)

  TBA

  Abstract: TBA

- Kashiwara (RIMS Kyoto)

  The simply-laced root system associated with the quantum affine algebras and their block decomposition

  Abstract: We introduce the new invariants for pairs of simple modules over quantum affine algebras. As a byproduct we attach the root system to each quantum algebra in a natural way. Moreover the block decomposition of the category of finite-dimensional modules is parametrized the corresponding root lattice.

- R.Kessar (City Univ. London)

  Weight conjectures, exotic fusion systems, and complex reflection groups

  Abstract: TBA

- C.Lecouvey (Univ. Tours)

  Atomic decomposition of characters and t-analogues of weight multiplicities

  Abstract: The crystal associated to a finite-dimensional irreducible representation of a Lie algebra introduced in the 90's by Kashiwara, Lusztig and Littelmann gives a simple combinatorial description of the character of the representation considered. The dominant

part of this character admits a subtle graduation where the weight space multiplicities are replaced by their natural t-analogues (Kostka polynomials, Lusztig t-analogues). In this talk, I will present a combinatorial model for the dominant part of these characters yielding an atomic decomposition, each atom being the formal sum of all dominant weights less or equal to a given dominant weight. In classical types, it is conjectured (and proved in type A) that this decomposition is compatible with the previous graduation and has a geometric interpretation in terms of intersection cohomology of Schubert varieties. This is a work in collaboration with Lenart (Albany USA).

- A. Mathas (Univ. Sydney)

  Filtrations of graded Specht modules

  Abstract: TBA

- A. Moura (Campias, Sao Paulo)

  On Generalized Demazure Modules Arising from Prime Simple Modules for Quantum Affine Algebras

  Abstract: Although the finite-dimensional representation theory of quantum affine algebras has been intensively studied since the early 1990's, several natural questions about the underlying abelian tensor categories remain unanswered. We will focus on the problem of classifying and describing the structure of the prime simple objects of these categories. A classification of these objects in terms of their highest ℓ-weights (Drinfeld polynomials) is known only when the underlying finite-dimensional simple Lie algebra is $\mathfrak{sl}_2$. In that case, it is known since the early work of Chari and Pressley that the prime simple modules are the evaluation modules. For higher rank, a classification of the prime simple objects in terms of their Drinfeld polynomials is far from understood. Nevertheless, several important families of such modules have been identified and, in many cases, the study of their structures has revealed interesting connections with the theory of generalized Demazure modules.

  We will report on a ongoing joint work with M. Brito, V. Chari, and Y. Popov, dedicated to study the simple prime modules belonging to certain Hernandez-Leclerc subcategories when the underlying simple Lie algebra is of type D.

- A. Negut (MIT)

  TBA

  Abstract: TBA

- A. Oblomkov (MIT)

  TBA

  Abstract: TBA

- H. Oya (Shibaura Institute of Technology)

  Calculation of q-characters of simple modules over quantum loop algebras of non-symmetric type

  Abstract: I explain our strategy for the calculation of q-characters of simple modules over quantum loop algebras of non-symmetric type. In the first half, I show the validity

of the Kazhdan-Lusztig algorithm, which is proposed by D. Hernandez as a conjectural algorithm, in the case of type $B_n^{(1)}$. In the second half, I talk about a cluster theoretic method using results of monoidal categorification of cluster algebras via quantum loop algebras. This is joint work with David Hernandez.

- L. Poulain d'Andecy (Univ. Reims)

  TBA

  Abstract: TBA

- R. Rouquier (UCLA)

  TBA

  Abstract: TBA

- B. Spath (Univ. Wuppertal)

  Action of automorphisms on characters of finite reductive groups

  Abstract: TBA

- V. Toledano Laredo (Northeastern)

  TBA

  Abstract: TBA

Program :
TBA

Monday	Tuesday	Wednesday	Thursday	Friday
9h30-10h30	9h30-10h30	9h30-10h30	9h30-10h30	9h30-10h30
11h-12h	11h-12h	11h-12h	11h-12h	11h-12h
Lunch	Lunch	Lunch	Lunch	Lunch
14h-15h	14h-15h		14h-15h	14h-15h
15h30-16h30	15h30-16h30		15h30-16h30	15h30-16h30