Rencontre satellite à l'ICMP 2018
« Méthodes algébriques en physique mathématique »
16 au 20 juillet 2018

Satellite event to the ICMP 2018
"Algebraic methods in mathematical physics"
July 16-20, 2018

Quasi-Hopf algebras for extended *W*-algebras in Logarithmic CFTs

Azat Gainutdinov *

Azat.Gainutdinov@lmpt.univ-tours.fr

I will talk about representation categories of Vertex Operator Algebras describing certain class of Logarithmic CFTs, in the case when they are rigid and have finitely many (iso classes) of irreducible representations. Such categories are non-semisimple and are expected to be modular tensor categories (i.e. with non-degenerate braiding). Basic examples are provided by the so-called triplet W-algebras and by chiral algebras of N pairs of symplectic fermion fields. Calculating Perron-Frobenius dimensions of irreducible representations, one can conclude that the representation categories in these cases should be realized via representations of a factorizable (quasi-)Hopf algebra. It is indeed the case and turns out that the quasi-Hopf algebras we encounter here are simple modifications of well-know finite-dimensional quantum groups at roots of unity. In particular for the triplet W-algebra, we have proposed a braided monoidal equivalence with the representation category of a quasi-Hopf modification of the restricted quantum group for $sl(2)$ at roots of unity of even order. The main ingredient in the construction of such a quasi-quantum group is the theory of VOA extensions by simple currents. This is a joint work with T. Creutzig and I. Runkel. Using another approach based on theory of Nichols algebras in braided categories, we also found a unique (up to a twist) factorizable quasi-Hopf algebra for any finite root system and any root of unity of even order, and formulated a conjecture about ribbon equivalence with representation categories of extended W-algebras.

This is a joint work with S. Lentner and T. Ohrmann.

*Institut Denis Poisson, CNRS, Université de Tours, Parc de Grandmont, 37200 Tours, FRANCE