TBA

Vendredi 12 Juillet 2019, 14 :30
IHES, Amphithéâtre Léon Motchane(Cours de l'IHES)
Domaines : math

Titre : *Quantum Geometry of Moduli Spaces of Local Systems and Representation Theory (4/4)*

Orateur : **Alexander Goncharov (Yale University & IHES)**

Résumé : *Lectures 1-3 are mostly based on our recent work with Linhui Shen.*

Given a surface S with punctures and special points on the boundary considered modulo isotopy, and a split semi-simple adjoint group G, we define and quantize moduli spaces Loc(G,S) G-local systems on S, generalising character varieties.

To achieve this, we introduce a new moduli space P(G, S) closely related to Loc(G,S). We prove that it has a cluster Poisson variety structure, equivariant under the action of a discrete group, containing the mapping class group of S. This generalises results of V. Fock and the author, and I. Le.

*For any cluster Poisson variety X, we consider the quantum Langlands modular double of the algebra of regular functions on X. If the Planck constant h is either real or unitary, we equip it with a structure of a *-algebra, and construct its principal series of representations.*

Combining this, we get principal series representations of the quantum Langlands modular double of the algebras of regular functions on moduli spaces P(G, S) and Loc(G,S).

We discuss applications to representations theory, geometry, and mathematical physics.

In particular, when S has no boundary, we get a local system of infinite dimensional vector spaces over the punctured determinant line bundle on the moduli space M(g,n). Assigning to a complex structure on S the coinvariants of oscillatory representations of W-algebras sitting at the punctures of S, we get another local system on the same spa. We conjecture there exists a natural non-degenerate pairing between these local systems, providing conformal blocks for Liouville / Toda theories.

In Lecture 4 we discuss spectral description of non-commutative local systems on S, providing a non-commutative cluster structure of the latter. It is based on our joint work with Maxim Kontsevich.