Quantum Day 2019

March 18th

Aula 27

Programme (see next page for abstracts)

Speaker	Title	Time
Simon Lentner	Nichols Algebra action on Vertex Algebras	10.30 - 11.30
Coffee break		11.30 - 11.50
Ilaria Flandoli	Screening operator algebras acting on CFTs	11.50 - 12.20
Lunch		13.00 - 15.00
Guillermo Sanmarco	Examples of Finite Dimensional Hopf Algebras Over Non-Abelian Groups	15.30 - 15.30
Coffee break		15.30 - 16.00
Vincent Koppen	The category-valued trace for bimodule categories: a representation-theoretic realisation	16.00 - 16.30
Noelia Bortolussi	The character algebra for module categories over Hopf algebras	16.30 - 17.00

Abstracts

"Nichols Algebra action on Vertex Algebras"
Simon Lentner

I will talk about ongoing work with Y.-Z. Huang. For any vertex algebra with suitable regularity (no previous knowledge is assumed), we study the algebra of screening operators. We prove that it is the Nichols algebra of a certain object in the braided tensor category of vertex algebra modules, which Huang-Lepowski-Zhang have constructed from the behavior of certain analytical continuation. For the lattice vertex algebra, our proof reduces to my previous result that in this case the screening operators give diagonal Nichols algebras, by explicitly studying Selberg integrals and their analytical continuation.

"The character algebra for module categories over Hopf algebras"
Noelia Bortolussi

For an arbitrary finite tensor category $\mathcal{C}$, Shimizu introduced the notion of adjoint algebra $\mathcal{A}_\mathcal{C}$ and the space of class functions $CF(\mathcal{C})$. These concepts generalize the notion of adjoint representation and the character algebra of a finite group. In his work "Further results on the structure of (co)ends in finite tensor categories" (2018), he defines the adjoint algebra $\mathcal{A}_\mathcal{M}$ and the space of class functions $CF(\mathcal{M})$ associated to a module category $\mathcal{M}$ over a finite tensor category.
In this talk I will present an explicit computation of the adjoint algebra in the case $\mathcal{C}$ is the representation category of a finite dimensional Hopf algebra H and $\mathcal{M}$ is an exact indecomposable module category over $Rep(H)$.

"Screening operator algebras acting on CFTs"
Ilaria Flandoli

The algebra of screening operators acts on Conformal Field Theories (CFTs) obeying, under certain conditions, Nichols algebras relations. We see in examples how to use this action to define, for CFTs described by lattice vertex algebras, a subalgebra with the same Representation theory of a small quantum group. My current research project is to determine all lattice vertex algebras where the screening operators algebra is indeed a finite dimensional Nichols algebra or an extension thereof.

"The category-valued trace for bimodule categories: a representation-theoretic realisation"
Vincent Koppen

The category-valued trace assigns to a bimodule category over a linear monoidal category a linear category. It generalises Drinfeld centers of monoidal categories and the relative Deligne product of bimodule categories. In this talk, we consider bimodule categories that are given as categories of bicomodules over a Hopf algebra. Our main result is a representation-theoretic realisation of the category-valued trace as a category of generalised Hopf bimodules.

"Examples of Finite Dimensional Hopf Algebras Over Non-Abelian Groups"
Guillermo Sanmarco

We will recall some results of Heckenberger and Vendramin regarding the classification of finite dimensional Nichols algebras of pairs of absolutely simple Yetter-Drinfeld modules over non-abelian groups. Then we will focus on one particular example of such pairs. We present the corresponding Nichols algebras by generators and relations and compute all the liftings.