

Algebras and Knots

14 November 2014

- 10:30 – 11:20** **Christian Blanchet** (Université Paris Diderot - Paris 7)
Quantum $\mathfrak{sl}(2)$, non semi-simple invariants
- 11:30 – 12:20** **Ivan Marin** (Université de Picardie Jules Verne)
A central extension of the Hecke algebra at $q = -1$
- 14:10 – 15:00** **Sofia Lambropoulou** (National Technical University of Athens)
On the framization of knot algebras
- 15:10 – 16:00** **Konstantinos Karvounis** (Universität Zürich)
Classical knot invariants from the Yokonuma–Hecke algebras
- 16:30 – 17:20** **Loïc Poulain d’Andecy** (Université de Reims Champagne-Ardenne)
Morita equivalence for Yokonuma–Hecke algebras and applications

Abstracts of Talks

Christian Blanchet *Quantum $\mathfrak{sl}(2)$, non semi-simple invariants.*

We will present the quantum deformations of $\mathfrak{sl}(2)$ representations, their role in the construction of invariants of knots and Witten-Reshetikhin-Turaev TQFTs. We will then consider variants of the quantum group $\mathfrak{sl}(2)$ with nilpotent representations which lead to new invariants obtained by Costantino-Geer-Patureau for 3-manifolds with flat connection. Finally we will introduce the non semi-simple TQFTs we have recently constructed in joint work with François Costantino, Nathan Geer and Bertrand Patureau.

Ivan Marin *A central extension of the Hecke algebra at $q = -1$.*

In a joint work with E. Wagner, we introduced a central extension of the Iwahori-Hecke algebra at $q = -1$, attached to any Coxeter system (W, S) . This extension also admits a uniform presentation as a quotient of the attached Artin-Tits group. In type A , we define a Markov trace on this algebra that provides a ‘new’ link invariant.

Sofia Lambropoulou *On the framization of knot algebras.*

In this talk we discuss the framization of some knot algebras. We explain the motivations of the concept of framization, coming from the Yokonuma–Hecke algebras, as well as recent results on the framization of the Temperley–Lieb algebra. Finally, we propose framizations for other knot algebras such as the BMW algebra, the B-type related Hecke algebras and the singular Hecke algebra.

Konstantinos Karvounis *Classical knot invariants from the Yokonuma–Hecke algebras.*

J. Juyumaya and S. Lambropoulou have constructed invariants for classical and framed knots from the Yokonuma–Hecke algebras, using a Markov trace. A computer program has been developed to investigate the relationship between the invariants for classical knots and the HOMFLYPT polynomial. The computational results have helped to formulate a theorem about the Markov trace and a conjecture about the invariants, in the case of classical knots.

Loïc Poulain d’Andecy *Morita equivalence for Yokonuma–Hecke algebras and applications.*