Representation Theory
Théorie des représentations
(Org: **Alistair Savage** (University of Ottawa) and/et **Alex Weekes** (Université de Sherbrooke))

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Skein algebras of punctured spheres, Coulomb branches and knot homology

Certain skein algebras of surfaces are expectied to be isomorphic to K-theoretic Coulomb branch algebras. This suggests that these algebras can be categorified using coherent sheaves on BFN spaces. I will explain how we can combine my older work with Cautis into this perspective in order to obtain homological knot invariants for knots in thickened punctured spheres.

NICCOLO MATTAREI, University of Ottawa

THOMAS MORAN, University of Ottawa

MONICA NEVINS, University of Ottawa
Representations of p-adic groups near the identity

The infinite-dimensional irreducible representations of p-adic groups have an elegant geometric structure near the identity. The analytic nature of this structure, expressed in terms of the character of the representation, has been known since the 1970s, and recently progress has been made on understanding it in more concrete terms via the restriction of representations to sufficiently small compact open subgroups. In this talk, we describe the ideas and the techniques involved, focusing on geometric and combinatorial aspects. Parts of this talk are based on ongoing joint work with Ekta Tiwari (IISER Pune), with Zander Karaganis (UBC), and with David Schwein (Utah).

THEO PINET, McGill

ANDREW RIESEN, M.I.T.

HOMA ROUDINI, University of Ottawa

LEONID RYBNIKOV, Université de Montréal

HADI SALMASIAN, University of Ottawa

JAKE S. ZIMMERMANN SIMMONS, University of Toronto
Regular Bisections of Nilpotent Subalgebras of $\mathfrak{sl}(n)$

In this talk, we explore how nilpotent regular Lie subalgebras $\mathfrak{g}$ of the special linear algebra $\mathfrak{sl}(n)$ can be split into bisections, pairs of subalgebras of $\mathfrak{g}$ that equal $\mathfrak{g}$ as a vector space direct sum. These splittings help reveal internal structure of the $\mathfrak{g}$ and provide a concrete way to understand how its parts fit together, through a matrix representation of the bisections. There is a classical bijection between biclosed subsets of root systems and biclosed subsets of root systems. In this talk we will investigate a counting of bisections of the strict upper triangle algebra $\mathfrak{n}(n) \subseteq \mathfrak{sl}(n)$ which provides a new perspective on this bijection, and will discuss how this could lead to investigations using the Weyl group of a matrix representations of bijections, implicitly giving a group structure on all bisections any nilpotent regular subalgebra of $\mathfrak{sl}(n)$. There will be $n!$ bisections of $\mathfrak{n}(n)$ and this will be proven. The proof uses an induction argument that introduces the idea of extending algebras, and those extensions being complementary to each other. Only the bisections of some algebras can be represented as matrices, but all are relevant to the Weyl group as structure of bisections in general can be inherited by those that can be represented as matrices. Lastly, we present an algorithm, which we will call the falling terms algorithm, to count bisections of subalgebras of the strict upper triangle.

JOSHUA SUSSAN, CUNY Medgar Evans College

ALEKSANDR (SASHA) TRUFANOV, University of Montreal

BEN WEBSTER, University of Waterloo

MERI ZAIMI, Perimeter Institute for Theoretical Physics

KIRILL ZAYNULLIN, University of Ottawa