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"Yangians and finite W-algebras"

Abstract:

For a finite-dimensional semi-simple Lie algebra $\mathfrak{g}$, the *Yangian* of $\mathfrak{g}$ is an infinite-dimensional Hopf algebra $Y(\mathfrak{g})$. It is a deformation of the universal enveloping algebra of the Lie algebra of polynomial currents of $\mathfrak{g}$: $\mathfrak{g}[t] = \mathfrak{g} \otimes \mathbb{C}[t]$.

A *finite W-algebra* is a certain associative algebra attached to a pair $(\mathfrak{g}, e)$, where $e \in \mathfrak{g}$ is a nilpotent element. It is a generalization of the universal enveloping algebra $U(\mathfrak{g})$.

Physicists observed a correspondence between Yangians and finite W-algebras constructed for the general linear Lie algebras. We consider a super analogue of the general linear Lie algebra called the *queer Lie superalgebra* $Q(n)$ and show that there exists a relationship between the corresponding super-Yangian and finite W-algebra. We use it to classify irreducible finite-dimensional representations of these superalgebras.
This is a joint work with V. Serganova.