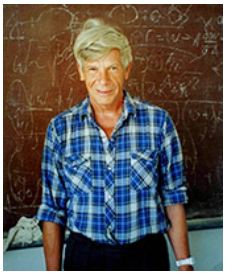

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Gaudin model with arbitrary complex spin

Thursday, 13 October 2022 14:55 (25 minutes)

Quantum spin chains and their degenerations, quantum Gaudin models, play an important role in modern mathematics. The study of these integrable models is interlaced with such areas as the representation theory of Lie algebras and their deformations, the quantum cohomology and K-theory of quiver varieties, the geometric Langlands correspondence.

It is natural to study Lie-theoretic constructions using the language of symmetric tensor categories. In the talk, I will apply this philosophy to the quantum rational Gaudin model associated with the Lie algebra $\mathfrak{gl}_n$. I will show that there is a natural construction of the higher Gaudin Hamiltonians associated with the Deligne's category $\underline{Rep}(GL_t)$, $t \in \mathbb{C}$, which can be understood as an interpolation of the category $Rep(GL_n)$ of finite-dimensional representations of the Lie group GL_n to any complex n. This construction is a step towards understanding of the Gaudin model associated with the Lie superalgebra $\mathfrak{gl}_{m|n}$.

It is known that the relations in the algebra of higher Gaudin Hamiltonians (the Bethe algebra) are given by certain no-monodromy conditions on a differential operator of order n. In the second part of the talk, I will discuss how these conditions can be interpolated to any complex n and how these interpolations are related to the Bethe algebra for the Deligne's category.

This is an ongoing project, joint with L. Rybnikov

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