

# Tensor isomorphism between Yangians and quantum loop algebras

Sachin Gautam \*

[sachin@math.columbia.edu](mailto:sachin@math.columbia.edu)

WEB: [www.math.columbia.edu/~sachin](http://www.math.columbia.edu/~sachin)

---

The Yangian and the quantum loop algebra of a simple Lie algebra  $\mathfrak{g}$  arise naturally in the study of the rational and trigonometric solutions of the Yang—Baxter equation, respectively. These algebras are deformations of the current algebra  $\mathfrak{g}[s]$  and the loop algebra  $\mathfrak{g}[z; z^1]$  respectively.

The aim of this talk is to establish an explicit relation between the finite-dimensional representation categories of these algebras, as *meromorphic braided tensor categories*. The notion of meromorphic tensor categories was introduced by Y. Soibelman and finite-dimensional representations of Yangians and quantum loop algebras are among the first non-trivial examples of these.

The isomorphism between these two categories is governed by the monodromy of an abelian difference equation. Moreover, the twist relating the tensor products is a solution of an abelian version of the qKZ equations of Frenkel and Reshetikhin.

*These results are part of an ongoing project, joint with V. Toledano Laredo.*

---

\*Department of Mathematics, Columbia University, 2990 Broadway, New York, NY 10027, USA.