

# Quantization in Representation Theory, Derived Algebraic Geometry, and Gauge Theory



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## Bethe algebras, cacti, and crystals

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The Yangian of a reductive Lie algebra contains a family of maximal commutative subalgebras—the Bethe subalgebras—parametrized by regular elements of the maximal torus. In the case of  $\mathfrak{gl}(n)$ , it is known that this family extends to a larger one indexed by points of the Deligne-Mumford compactification of  $M(0, n+2)$ . For any point  $C$  in the real locus of this parameter space, and a fixed tame Yangian representation  $V$ , the Bethe subalgebra  $B(C)$  acts on  $V$  with simple spectrum. I will discuss the structure of the resulting unramified covering—with fiber over  $C$  given by the set of eigenlines for the action of  $B(C)$ , which can be identified with a collection of Gelfand-Tsetlin keystone patterns carrying a  $\mathfrak{gl}(n)$ -crystal structure, as well as the monodromy action realized by a type of cactus group. This is joint work with Anfisa Gurenkova and Leonid Rybnikov.

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