

Title: Elliptic quantum groups and affine Grassmannians over an elliptic curve

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Abstract: <p>This is based on my joint work with Yaping Yang. In this talk, we use the equivariant elliptic cohomology theory to study the elliptic quantum groups. We define a sheafified elliptic quantum group for any symmetric Kac-Moody Lie algebra. This definition is naturally obtained using the cohomological Hall algebra associated to the equivariant elliptic cohomology. After taking suitable rational sections, the sheafified elliptic quantum group becomes a quantum algebra consisting of the elliptic Drinfeld currents. The Drinfeld currents satisfy the relations of the elliptic quantum group studied by Felder and Gautam-Toledano Laredo. We show the elliptic quantum group acts on the equivariant elliptic cohomology of Nakajima quiver varieties.</p>

<p>In particular, the sheafified elliptic quantum group is an algebra object in a certain monoidal category of sheaves on the colored Hilbert scheme of an elliptic curve. This monoidal structure is related to Mirkovic's refinement of the factorization structure on semi-infinite affine Grassmannian over an elliptic curve. If time permits, I will also talk about a work in progress, joint with Mirkovic and Yang, towards a construction of a double loop Grassmannian and vertex representations of the toroidal algebra, which in turn is related to representations of the elliptic quantum groups</p>

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