Algebra/Topology Seminar

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Quiver Varieties and Elliptic Quantum Groups

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1:15 p.m. in ES-143

ABSTRACT. In this talk, we use the equivariant elliptic cohomology theory of Ginzburg-Kapranov-Vasserot to study the elliptic quantum groups. We introduce, for each quiver Q, the elliptic cohomological Hall algebra (CoHA) of Q, as the elliptic cohomology of the moduli of representations of the preprojective algebra of Q. In particular, the elliptic CoHA is an algebra object in a certain monoidal category of sheaves on the symmetric powers of an elliptic curve. This elliptic CoHA naturally acts on the equivariant elliptic cohomology of Nakajima quiver varieties. After taking suitable rational sections, the elliptic CoHA becomes a quantum affine algebra. It has an explicit shuffle description. We show the Drinfeld currents satisfy the relations of the elliptic quantum group studied by Felder. The elliptic CoHA action on Nakajima quiver varieties is compatible with the actions induced by Hecke correspondence of Nakajima. This is based on my joint work in progress with Yaping Yang.