

Quiver mutation and quantum dilogarithm identities

Quiver mutation is an elementary operation on quivers which appeared in physics in Seiberg duality in the 1990s and in mathematics in Fomin-Zelevinsky's definition of cluster algebras in 2002. In this talk, I will show how, by comparing sequences of quiver mutations, one can construct identities between products of quantum dilogarithm series. These identities generalize Faddeev-Kashaev-Volkov's classical pentagon identity and the identities obtained recently by Reineke. Morally, the new identities follow from Kontsevich-Soibelman's theory of refined Donaldson-Thomas invariants. They can be proved rigorously using the theory linking cluster algebras to quiver representations.