POISSON GEOMETRY AND REPRESENTATION THEORY OF ROOT OF UNITY QUANTUM CLUSTER ALGEBRAS

Speaker: Prof. Milen Yakimov
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Time：Tue, Jan. 27, 15:30-16:30

Venue: Room 102, SCMS

Abstract: We will provide a gentle introduction to Cluster Algebras focusing at their Poisson geometry and representation theory at roots of unity. We will show that all root of unity quantum cluster algebras have canonical structures of Cayley-Hamilton algebras (in the sense of Procesi), which allows the transfer of finite generation between the quantum and classical situations. We will then focus on the geometry of the Gekhtman-Shapiro-Vainshtein Poisson brackets, proving that the spectra of cluster algebra have explicit Zariski open torus orbit of symplectic leaves, which is a far-reaching generalization of the Richardson divisor of a Schubert cell in Lie theory. We will finish with a classification of the irreducible representations of quantum cluster algebras at roots of unity of maximal dimension. This is a joint work with Shengnan Huang, Thang Le, Greg Muller, Bach Nguyen and Kurt Trampel.