

Representation Theory, Geometry & Combinatorics Seminar

Organizer: Mark Haiman & Kolya Reshetikhin

Wednesday, 4:00–6:00pm, 939 Evans

Nov. 7 **David Hernandez**, CNRS, Versailles

Geometric and combinatorial applications of Frenkel-Reshetikhin character theory

We give a solution to the following two problems: the Nakajima geometric smallness problem for resolutions of quiver varieties (on the small property in the sense of Borho-MacPherson of these projective morphisms), and the Kirillov-Reshetikhin conjecture (on character formulas and branching rules for certain simple representations of quantum affine Kac-Moody algebras, including twisted types). For both proofs the Frenkel-Reshetikhin q -characters are a crucial tool. These results are also extended to quantum toroidal algebras, by using a fusion tensor category associated to the Drinfeld “coproduct.” Consequences for Cherednik algebras and the existence of crystal basis are discussed.