Representation Theory, Geometry & Combinatorics Seminar

Organizer: Mark Haiman & Nicolai Reshetikhin

Wednesday, 4:00–6:00pm, 939 Evans

Mar. 15 **Rinat Kedem**, Illinois

Fusion products, Kostka polynomials and fermionic formulas

The fusion product defined by Feigin and Loktev is a graded tensor product of $\mathfrak{g}$-modules. The grading is compatible with the homogeneous grading of the associated affine Lie algebra. In special cases, the graded multiplicities can be computed explicitly. In the simplest examples of $\mathfrak{sl}_n$ they are the classical, generalized or level-restricted Kostka polynomials. The fusion product of any Kirillov-Reshetikhin-type modules can be computed explicitly for any simple Lie algebra. The graded multiplicities are given by fermionic formulas in these cases, and imply the Kirillov-Reshetikhin conjecture for tensor multiplicities of Yangian modules. In this talk I will explain some of the basic ideas and describe some open problems.