Mathematical Physics Seminar

Wednesday, Apr 5, 1:30 – 2:30pm, Zoom

Speaker: Jean-Emile Bourgine (University of Melbourne & Sogang University)

Title: Shifted quantum groups in Algebraic Engineering

Abstract:

Geometric engineering refers to the study of gauge theories as a low-energy limit of string theory in specifically constructed geometric backgrounds. Algebraic engineering combines this geometric approach with the integrable properties of some supersymmetric gauge theories to propose a construction of their BPS observables using the representation theory of quantum groups. In this talk, I will briefly review this construction. In the second part, I will recall the notion of "shifted quantum groups" which is useful to describe gauge theories with matter hypermultiplets. This subtle modification of the original definition of quantum groups brings more flexibility in the representation theory. I will present several new representations for the shifted quantum affine sl(2) and quantum toroidal gl(1) algebras, and explain how they enter in the construction of gauge theory observables.