

Math/Phys seminar Tues, Oct 15, 2024

Speaker: Theo Pinet, University of Paris

Where: Zoom (see <https://www.math.purdue.edu/~ebkaufma/seminar.html>)

Title: Inflations for representations of shifted quantum affine algebras

Abstract:

The only finite-dimensional simple Lie algebra admitting a 2-dimensional irreducible representation is $\mathfrak{sl}(2)$. The restriction functors arising from Dynkin diagram inclusions in (classical) Lie theory are thus in general not essentially surjective on finite-dimensional simple modules. The goal of this talk is to specify whether or not this "surjectivity defect" remains in the case of Finkelberg-Tsymbaliuk's shifted quantum affine algebras (SQAAs).

SQAAs are infinite-dimensional associative algebras parametrized by a simple finite-dimensional Lie algebra and a coweight in the corresponding coweight lattice. They appear naturally in the study of Coulomb branches, of quantum integrable systems and of cluster algebras. In this presentation, we will give a brief introduction to the vast representation theory of SQAAs and will state some results about the existence of remarkable modules, that we call "inflations", which are constructed as special preimages for different canonical restriction functors (associated here also to Dynkin diagram inclusions). We will finally, if time permits, discuss potential applications of our results to the study of cluster structures on Grothendieck rings.