NCTS Short Course on Representation Theory:

Lecture series on Quantum Wreath Products

NCTS National Center for Theoretical Sciences

Time 13:00-15:00, August 1, August 4, 2023

Venue R440, Astronomy-Mathematics Building, NTU

Speaker

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Registration

Course Background & Purposes

Recently, we introduce a new notion called the quantum wreath product, which can be thought as a quantization of the classical wreath product of groups, but it produces algebras instead.

Important examples include many variants of the Hecke algebras, such as the Ariki-Koike algebras, the affine Hecke algebras, and their degenerate version, Wan-Wang's wreath Hecke algebras, Rosso-Savage's (affine)Frobenius Hecke algebras, Kleshchev-Muth's affine zigzag algebras, and the Hu algebra that quantizes the wreath product between symmetric groups.

We will talk about general properties regarding structure theory and representation theory of the quantum wreath product algebras. In particular, we will focus on the Hu algebras and the application to the Ginzburg-Guay-Opdam-Rouquier problem on the highest weight covers for the Hecke algebra of complex reflection group.

Course Outline & Descriptions

We plan to cover the following topics in this course:

Day 1

Classical and quantum Schur dualities, highest weight covers, Hu algebras, and canonical basis.

Day 2

Definition and examples of quantum wreath product algebras, basis theorem, symmetric algebra structures, Schur duality for quantum wreath product algebras.