**THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY**

## Department of Mathematics

# ALGEBRA AND GEOMETRY SEMINAR

# Graded character sheaves, HOMFLY-PT homology, and Hilbert schemes of points on C²

by

# Prof. Penghui LI
Tsinghua University

## Abstract

Using a geometric argument building on our new theory of graded sheaves, we compute the categorical trace and Drinfel'd center of the (graded) finite Hecke category H_W in terms of the category of (graded) unipotent character sheaves, upgrading results of Ben-Zvi-Nadler and Bezrukavninov-Finkelberg-Ostrik. In type A, we relate the categorical trace to the category of 2-periodic coherent sheaves on the Hilbert schemes of points on C^2 (equivariant with respect to the natural C*×C* action), yielding a proof of a conjecture of Gorsky-Negut-Rasmussen which relates HOMFLY-PT link homology and the spaces of global sections of certain coherent sheaves on Hilbert schemes. As an important computational input, we also establish a conjecture of Gorsky-Hogancamp-Wedrich on the formality of the Hochschild homology of H_W. This is a joint work with Quoc P. Ho.

**Date** : 27 September 2023 (Wednesday)

**Time** : 3:00pm – 4:30pm

**Venue** : Room 4475 (Lifts 25/26)

*All are Welcome!*