



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

ALGEBRA AND GEOMETRY SEMINAR

**Syzygies of determinantal thickenings
and $\mathfrak{gl}(m|n)$ representations**

By

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Abstract

The coordinate ring $S = \mathbb{C}[x_{\{i,j\}}]$ of space of $m \times n$ matrices carries an action of the group $GL_m \times GL_n$ via row and column operations on the matrix entries. If we consider any $GL_m \times GL_n$ -invariant ideal I in S , the syzygy modules $\text{Tor}_i(I, \mathbb{C})$ will carry a natural action of $GL_m \times GL_n$. Via BGG correspondence, they also carry an action of $\wedge^*(\mathbb{C}^m \otimes \mathbb{C}^n)$. It is a result by Raicu and Weyman that we can combine these actions together and make them modules over the general linear Lie superalgebra $\mathfrak{gl}(m|n)$. We will explain how this works and how it enables us to compute all Betti numbers of any $GL_m \times GL_n$ -invariant ideal I .

Date : 30 July 2024 (Tuesday)

Time : 4:30pm – 5:30pm

Venue : Room 2463 (Lift 25/26)

All are Welcome!