

ALGEBRAIC GEOMETRY AND COMMUTATIVE ALGEBRA SEMINAR

Speaker: Amy Huang
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Date: Wednesday, April 17, 2019

Time: 3:00 PM

Location: 258 Hurley Hall



Lecture Title:

Syzygies of Determinantal Thickenings via General Linear Lie Superalgebra Representations

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 $\bigwedge^\bullet(\mathbb{C}^m \otimes \mathbb{C}^n)$. It is a recent 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 . The latter part will involve combinatorics of Dyck paths.