Title: Syzygies of line bundles on Segre-Veronese varieties

Abstract:

Syzygies are important classical invariants attached to algebraic varieties. They can be defined iteratively starting from the defining equations of a variety and continuing with the relations between these equations, the relations between the relations etc. In the special case of the Segre-Veronese embeddings of products of projective spaces, the structure of syzygies is particularly rich, due to the presence of a large group of symmetries. Their study can be approached through a variety of techniques, placing them at the confluence of algebraic geometry, commutative algebra, representation theory and combinatorics. I will discuss some recent results on the structure of the syzygies of line bundles on Segre-Veronese varieties, and explain how their vanishing controls the asymptotic vanishing behavior (in the sense of Ein and Lazarsfeld) of syzygies of arbitrary algebraic varieties.