

## Algebraic Geometry Seminar

### *Sharp upper bounds of the graded Betti numbers and classifications*

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**Abstract:** For a projective variety (or scheme), the graded Betti numbers are defined from either the minimal free resolution of the homogeneous coordinate ring or the Koszul complex.

These extrinsic numbers measure the complexity of the relations between the defining equations and reflect the intrinsic and geometric information on a variety. In this talk, I'd like to introduce the results of Castelnuovo and Fano on quadric equations and generalize them to the higher linear syzygies in the first strand.

As a consequence, I'd like to characterize varieties of minimal degree and Del Pezzo varieties

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with respect to linear syzygies. Main ideas are inner projections, mapping cone and partial elimination ideals due to M. Green.

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