

Title: Algebraic Geometry and Combinatorics

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Topics to be covered include:

June Huh's Fields Medal works: Hodge Theory of Combinatorial Geometries/Matroids.

Hodge Theory

Matroids/Projective Configurations/Grassmannians.

Logarithmic Convexity

Tropical Geometry

Mnev's Universality

Singularities.

Learning outcome: Students should be able to describe the moduli of n points on P^2 , at least for small n , and relate them to matroids/singularities.

Schedule:

weeks 1-4: matroid theory and some tropical geometry

weeks 5-8: the geometry of realizable matroids

last few weeks: Hodge theory of matroids: geometric motivation and combinatorial approach.

Prerequisite: one-semester course in algebraic geometry

Text: my lecture notes (to be distributed);

References: Various research surveys and papers.