Combinatorial Optimization: a Bridge Between Combinatorics and Algebra

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This lecture is an introduction to some recent results in Combinatorial Commutative Algebra. The main theme is that there are strong relationships between well known classes of hypergraphs in Combinatorics and monomial ideals in Algebra via techniques of Combinatorial Optimization. By these relationships, several new results on monomial ideals can be recovered by earlier results on hypergraphs. On the other hand, some open combinatorial problems can be translated to purely algebraic problems.