Castelnuovo theory and the geometric Schottky problem

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Abstract

Castelnuovo theory is roughly speaking a study of invariants of subvarieties in projective space based on analizing special configurations of points on them. This was initiated by the well-known Italian algebraic geometer at the end of the nineteenth century. Around the same time, the Schottky problem emerged: this is the problem of identifying the best known algebraic tori (abelian varieties), namely Jacobians of curves, among all abelian varieties. In its geometric form, the Schottky problem asks for identifying Jacobians based on special properties of a codimension one locus called the theta divisor (on Jacobians this is the zero locus of the famous theta function). In this talk I will explain joint work with G. Pareschi, in which we established a close parallel between these two classical contexts, motivated by modern developments.