

Symmetries in Algebraic Geometry and Cremona transformations

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Abstract

In this talk I will discuss symmetries of algebraic varieties. When studying a projective variety X , one usually wants to understand its automorphisms. Conversely, the structure of the group of automorphisms of X encodes relevant geometric properties of the variety. After describing some examples of automorphism groups of projective varieties, I will discuss why the notion of automorphism is too rigid in the scope of birational geometry. We are then led to consider another class of symmetries of X , its birational self-maps. Birational self-maps of the projective space \mathbb{P}^n are called Cremona transformations. Describing the structure of the group of Cremona transformations of the plane is a classical problem that goes back to the 19th century. In higher dimensions, not so much is known, and a natural problem is to construct interesting subgroups of the Cremona group. I will end by discussing a recent work with Alessio Corti and Alex Massarenti, where we investigate subgroups of the Cremona group consisting of symmetries preserving special objects.