

Classification of Algebraic Varieties

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Abstract

A smooth complex projective variety is a compact complex manifold defined by polynomial equations.

In (complex) dimension 1, these are the well known compact Riemann surfaces. From the topological point of view, they are classified by their genus, however from the algebraic point of view, there is a $3g - 3$ dimensional family (for each $g \geq 2$).

In dimension 2, the situation is more complicated, however a satisfactory classification was achieved by the italian school of algebraic geometry at the beginning of the 20-th century. The Minimal Model Program is an attempt to generalize this classification to dimension ≥ 3 . In dimension 3 this program was completed in the 1980's by work of Mori and others. In this talk we will discuss recent results in the Minimal Model Program that have lead to several breakthroughs in the classification of algebraic varieties such as the finite generation of the canonical ring (of any smooth complex projective variety).

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