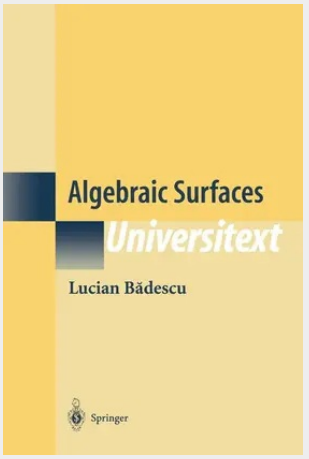
Badescu

Algebraic Surfaces

The aim of this book is to present certain fundamental facts in the theory of algebraic surfaces, defined over an algebraically closed field lk of arbitrary characteristic. The book is based on a series of talks given by the author in the Algebraic Geometry seminar at the Faculty of Mathematics, University of Bucharest. The main goal is the classification of nonsingular projective surfaces (also called simply surfaces). In the context of complex algebraic varieties, the classification was obtained by Enriques and Castelnuovo. Around 1960, Kodaira [Kodl, Kod2] revived and simplified the classification of complex algebraic surfaces and extended it to the case of compact analytic surfaces. The problem of classifying surfaces in arbitrary characteristic remained open. The first step in this direction was the purely algebraic proof (valid in arbitrary characteristic), due to Zariski [Zarl, Zar2], of Castelnuovo's criterion of rationality. Then Mumford [Mum3, Mum4] introduced several new ideas, and the classification of surfaces in positive characteristic be came possible. Finally, Bombieri and Mumford [BMl, BM2] completed the classification of surfaces in arbitrary characteristic. Their result was the following: The same types of surfaces that exist in the case when lk is the complex field arise in the general case, if one sets aside certain pathologies that arise only in characteristic 2 or 3.

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