<<代数几何中的解析方法>>

图书基本信息

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前言

The main purpose of this book is to describe analytic techniques which are useful to study questions such as linear series， multiplier ideals and vanishing theorems for algebraic vector bundles. One century after the ground-breaking work of Riemann on geometric aspects of function theory， the general progress achieved in differential geometry and global analysis on manifolds resulted into major advances in the theory of algebraic and analytic varieties of arbitrary dimension. One central unifying concept is positivity， which can be viewed either in algebraic terms （positivity of divisors and algebraic cycles）， or in more analytic terms （plurisubharmonicity， Hermitian connections with positive curvature）. In this direction， one of the most basic results is Kodairas vanishing theorem for positive vector bundles （1953——1954）， which is a deep consequence of the Bochner technique and the theory of harmonic forms initiated by Hodge during the 1940s. This method quickly led Kodaira to the well-known embedding theorem for projective varieties， a far reaching extension of Riemanns characterization of abelian varieties. Further refinements of the Bochner technique led ten years later to the theory of L2 estimates for the Cauchy-Riemann operator， in the hands of Kohn， Andreotti-Vesentini and Hormander among others. Not only can vanishing theorems be proved or reproved in that manner， but perhaps more importantly， extremely precise information of a quantitative naturc can be obtained about solutions of -equations， their zeroes， poles and growth at infinity. We try to present here a condensed exposition of these techniques， assuming that the reader is already somewhat acquainted with the basic concepts pertaining to sheaf theory， cohomology and complex differential geometry. In the final chapter， we address very recent questions and open problems， e.g. results related to the finiteness of the canonical ring and the abundance conjecture， as well as results describing the geometric structure of Kahler varieties and their positive cones. This book is an expansion of lectures given by the author at the Park City Mathematics Institute in 2008 and was published partly in Analytic and Algebraic Geometry， edited by Jeff McNeal and Mircea Mustata， It is a volume in the Park City Mathematics Series， a co-publication of the Park City Mathematics Institute and the American Mathematical Society.

内容概要

This volume is an expaion of lectures given by the author at the Park City Mathematics Ititute in 2008 as well as in other places. The main purpose of the book is to describe analytic techniques which are useful to study questio such as linear series, multiplier ideals and vanishing theorems for algebraic vector bundles. The exposition tries to be as condeed as possible, assuming that the reader is already somewhat acquainted with the basic concepts pertaining to sheaf theory,homological algebra and complex differential geometry. In the final chapte, some very recent questio and open problems are addressed, for example results related to the finiteness of the canonical ring and the abundance conjecture, as well as results describing the geometric structure of Kahler varieties and their positive cones.

书籍目录

章节摘录

In the dictionary between analytic geometry and algebraic geometry, the ideal plays a very important role, since it directly converts an analytic objectinto an algebraic one, and, simultaneously, takes care of the singularities in avery efficient way. Another analytic tool used to deal with singularities is thetheory of positive currents introduced by Lelong [Lel57]. Currents can be seen asgeneralizations of algebraic cycles, and many classical resultS of intersection theorystill apply to currents. The concept of Lelong number of a current is the analyticanalogue of the concept of multiplicity of a germ of algebraic variety. Intersectionsof cycles correspond to wedge products of currents （whenever these products aredefined）.

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