# <<几何分析手册（第2卷）>>

## 图书基本信息

书名：<<几何分析手册（第2卷）>>

13位ISBN编号：9787040288834

10位ISBN编号：7040288834

出版时间：2010-4

出版时间：高等教育出版社

作者：季理真 编

页数：431

## 前言

The marriage of geometry and analysis, in particular non-linear differential equations, has been very fruitful. An early deep application of geometric analysis is the celebrated solution by Shing-Tung Yau of the Calabi conjecture in 1976. In fact, Yau together with many of his collaborators developed important techniques in geometric analysis in order to solve the Calabi conjecture. Besides solving many open problems in algebraic geometry such as the Severi conjecture, the characterization of complex projective varieties, and characterization of certain Shimura varieties, the Calabi-Yau manifolds also provide the basic building blocks in the superstring theory model of the universe. Geometric analysis has also been crucial in solving many outstanding problems in low dimensional topology, for example, the Smith conjecture, and the positive mass conjecture in general relativity. Geometric analysis has been intensively studied and highly developed since 1970s, and it is becoming an indispensable tool for understanding many parts of mathematics. Its success also brings with it the difficulty for the uninitiated to appreciate its breadth and depth. In order to introduce both beginners and non-experts to this fascinating subject, we have decided to edit this handbook of geometric analysis. Each article is written by a leading expert in the field and will serve as both an introduction to and a survey of the topics under discussion. The handbook of geometric analysis is divided into several parts, and this volume is the second part. Shing-Tung Yau has been crucial to many stages of the development of geo- metric analysis. Indeed, his work has played an important role in bringing the well-deserved global recognition by the whole mathematical sciences community to the field of geometric analysis. In view of this, we would like to dedicate this handbook of geometric analysis to Shing-Tung Yau on the occasion of his sixtieth birthday. Summarizing the main mathematical contributions of Yau will take many pages and is probably beyond the capability of the editors. Instead, we quote several award citations on the work of Yau. The citation of the Veblen Prize for Yau in 1981 says："We have rarely had the opportunity to witness the spectacle of the work of one mathematician affecting, in a short span of years, the direction of whole areas of research Few mathematicians can match Yaus achievements in depth, in impact, and in the diversity of methods and applications."

## 内容概要

Geometric Analysis combines differential equations and differential geometry. An important aspect is to solve geometric problems by studying differential equations.Besides some known linear differential operators such as the Laplace operator,many differential equations arising from differential geometry are nonlinear. A particularly important example is the IVlonge-Ampere equation; Applications to geometric problems have also motivated new methods and techniques in differen-rial equations. The field of geometric analysis is broad and has had many striking applications. This handbook of geometric analysis provides introductions to and surveys of important topics in geometric analysis and their applications to related fields which is intend to be referred by graduate students and researchers in related areas.

## 书籍目录

curvature function The homogeneous contour integral6.1 Homogeneous functions and differential forms6.2 The homogeneous contour integral for a differential form6.3 The homogeneous contour integral for a measure6.4 Homogeneous integral calculus7 An explicit construction of valuations7.1 Duality7.2 Volume8 Classification of valuations9 Scalar valuations9.1 SL(n)-invariant valuations9.2 Hugs theorem10 Continuous GL(n)-homogeneous valuations10.1 Scalar valuations10.2 Vector-valued valuations11 Matrix-valued valuations.11.1 The Cramer-Rao inequality12 Homogeneous function- and convex body-valued valuations.13 QuestionsReferencesClassification of Fake Projective PlanesSai-Kee Yeung1 Introduction2 Uniformization of fake projective planes3 Geometric estimates on the number of fake projective planes.4 Arithmeticity of lattices associated to fake projective planes.5 Covolume formula of Prasad6 Formulation of proof7 Statements of the results8 Further studiesReferences

## 编辑推荐

The launch of this Advanced Lectures in Mathematics series is aimed at keeping mathematicians informed of the latest developments in mathematics， as well as to aid in the learning of new mathematical topics by students all over the world. Each volume consists of either an expository monograph or a collection of signifi-cant introductions to important topics. This series emphasizes the history and sources of motivation for the topics under discussion， and also gives an over view of the current status of research in each particular field. These volumes are the first source to which people will turn in order to learn new subjects and to discover the latest results of many cutting-edge fields in mathematics. Geometric Analysis combines differential equations and differential geometry. Animportant aspect is to solve geometric problems by studying differential equations. Besides some known linear differential operators such as the laplace operator， many differential equations arising from differential geometry are nonlinear. Aparticularly important example is the Monge-Ampre equation. Applications to geometric problems have also motivated new methods and techniques in differential equations. The field of geometric analysis is broad and has had many striking applications. This handbook of geometric analysis provides introductions to andsurveys of important topics in geometric analysis and their applications to related fields which is intend to be referred by graduate students and researchers in related areas.

# <<几何分析手册（第2卷）>>

## 版权说明