

《几何分析手册》

图书基本信息

书名：《几何分析手册》

13位ISBN编号：9787040288841

10位ISBN编号：7040288842

出版时间：2010-2

出版社：高等教育出版社

作者：季理真 编

页数：472

版权说明：本站所提供下载的PDF图书仅提供预览和简介以及在线试读，请支持正版图书。

更多资源请访问：www.tushu000.com

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 the 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 third part. Shing-Tung Yau has been crucial to many stages of the development of geometric 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.

内容概要

《几何分析手册(第3卷)》内容简介：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 Monge-Ampere 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 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

A Survey of Einstein Metrics on 4-manifolds Michael T. Anderson 1 Introduction 2 Brief review : 4-manifolds , complex surfaces and Einstein metrics 3 Constructions of Einstein metrics 4 Obstructions to Einstein metrics 5 Moduli spaces 6 Moduli spaces 7 Constructions of Einstein metrics 8 Concluding remarks 9 References

Sphere Theorems in Geometry Simon Brendle , Richard Schoen 1 The Topological Sphere Theorem 2 Manifolds with positive isotropic curvature 3 The Differentiable Sphere Theorem 4 New invariant curvature conditions for the Ricci flow 5 Rigidity results and the classification of weakly 1/4-pinched manifolds 6 Hamiltons differential Harnack inequality for the Ricci flow 7 Compactness of pointwise pinched manifolds 8 References

Curvature Flows and CMC Hypersurfaces Claus Gerhardt 1 Introduction 2 Notations and preliminary results 3 Evolution equations for some geometric quantities. 4 Essential parabolic flow equations 5 Existence results 6 Curvature flows in Riemannian manifolds 7 Foliation of a spacetime by CMC hypersurfaces 8 The inverse mean curvature flow in Lorentzian spaces 9 References

Geometric Structures on Riemannian Manifolds Naichung Conan Leung 1 Introduction 2 Topology of manifolds 2.1 Cohomology and geometry of differential forms 2.2 Hodge theorem 2.3 Witten-Morse theory 2.4 Vector bundles and gauge theory 3 Riemannian geometry 3.1 Torsion and Levi-Civita connections 3.2 Classification of Riemannian holonomy groups 3.3 Riemannian curvature tensors 3.4 Flat tori 3.5 Einstein metrics 3.6 Minimal submanifolds 3.7 Harmonic maps 4 Oriented four manifolds 4.1 Gauge theory in dimension four 4.2 Riemannian geometry in dimension four 5 Kahler geometry 5.1 Kahler geometry — complex aspects 5.2 Kahler geometry — Riemannian aspects 5.3 Kahler geometry — symplectic aspects 5.4 Gromov-Witten theory 6 Calabi-Yau geometry 6.1 Calabi-Yau manifolds 6.2 Special Lagrangian geometry 6.3 Mirror symmetry 6.4 K3 surfaces 7 Calabi-Yau 3-folds 7.1 Moduli of CY threefolds 7.2 Curves and surfaces in Calabi-Yau threefolds 7.3 Donaldson-Thomas bundles over Calabi-Yau threefolds. 7.4 Special Lagrangian submanifolds in CY 7.5 Mirror symmetry for Calabi-Yau threefolds 8 G2-geometry 8.1 G2-manifolds 8.2 Moduli of G2-manifolds 8.3 (Co-) associative geometry 8.4 G2-Donaldson-Thomas bundles 8.5 G2-dualities , trialities and M-theory 9 Geometry of vector cross products 9.1 VCP manifolds 9.2 Instantons and branes 9.3 Symplectic geometry on higher dimensional knot spaces. 9.4 C-VCP geometry 9.5 Hyperkahler geometry on isotropic knot spaces of CY 10 Geometry over normed division algebras 10.1 Manifolds over normed algebras 10.2 Gauge theory over (special) A-manifolds 10.3 A-submanifolds and (special) Lagrangian submanifolds. 11 Quaternion geometry 11.1 Hyperkahler geometry 11.2 Quaternionic-Kahler geometry 12 Conformal geometry 13 Geometry of Riemannian symmetric spaces 13.1 Riemannian symmetric spaces 13.2 Jordan algebras and magic square 13.3 Hermitian and quaternionic symmetric spaces 14 Conclusions 15 References

Symplectic Calabi-Yau Surfaces Tian-Jun Li 1 Introduction 2 Linear symplectic geometry 2.1 Symplectic vector spaces 2.2 Compatible complex structures 2.3 Hermitian vector spaces 2.4 4-dimensional geometry 3 Symplectic manifolds 3.1 Almost symplectic and almost complex structures 3.2 Cohomological invariants and space of symplectic structures 3.3 Moser stability and Darboux charts 3.4 Submanifolds and their neighborhoods 3.5 Constructions 4 Almost Kahler geometry 4.1 Almost Hermitian manifolds , integrability and operators. 4.2 Levi-Civita connection 4.3 Connections and curvature on Hermitian bundles 4.4 Chern connection and Hermitian curvatures 4.5 The self-dual operator 4.6 Dirac operators 4.7 Weitzenböck formulas and some almost Kahler identities. 5 Seiberg-Witten theory-three facets 5.1 SW equations 5.2 Spin (2) symmetry for a spin reduction 5.3 The compactness and Hausdorff property of the moduli space 5.4 Generic smoothness of the moduli space 5.5 Furuta finite dim. Approximations 5.6 SW invariants 5.7 Symplectic SW equations and Taubes nonvanishing 5.8 Symplectic SW solutions and Pseudo-holomorphic curves. 5.9 Bordism SW invariants via finite dim. Approximations 5.10 Mod 2 vanishing and homology type 6 Symplectic Calabi-Yau equation 6.1 Uniqueness and openness 6.2 A priori estimates 7 Symplectic Calabi-Yau surfaces 7.1 Symplectic birational geometry and Kodaira dimension 7.2 Examples 7.3 Homological classification 7.4 Further questions 8 References

Lectures on Stability and Constant Scalar Curvature D.H. Phong , Jacob Sturm 1 Introduction 2 The conjecture of Yau 2.1 Constant scalar curvature metrics in a given Kahler class. 2.2 The special case of Kahler-Einstein metrics 2.3 The conjecture of Yau 3 The analytic problem 3.1 Fourth order non-linear PDE and Monge-Ampere equations 3.2 Geometric heat flows 3.3 Variational formulation and energy functionals 4 The

spaces K of Bergman metrics 4.1 Kodaira imbeddings 4.2 The Tian-Yau-Zelditch theorem 5 The functional $F_0 = 0$ on K 5.1 $F_0 = 0$ and balanced imbeddings 5.2 $F_0 = 0$ and the Euler-Lagrange equation $R - R = 0$ 5.3 $F_0 = 0$ and Monge-Ampere masses 6 Notions of stability 6.1 Stability in GIT 6.2 Donaldson's infinite-dimensional GIT 6.3 Stability conditions on $\text{Diff}(X)$ orbits 7 The necessity of stability 7.1 The Moser-Trudinger inequality and analytic K-stability 7.2 Necessity of Chow-Mumford stability 7.3 Necessity of semi K-stability 8 Sufficient conditions : the Kähler-Einstein case 8.1 The χ -invariant 8.2 Nadel's multiplier ideal sheaves criterion 8.3 The Kähler-Ricci flow 9 General L : energy functionals and Chow points 9.1 F_0 and Chow points 9.2 K and Chow points 10 General L : the Calabi energy and the Calabi flow 10.1 The Calabi flow 10.2 Extremal metrics and stability 11 General L : toric varieties 11.1 Symplectic potentials 11.2 K-stability on toric varieties 11.3 The K-unstable case 12 Geodesics in the space/g of Kähler potentials 12.1 The Dirichlet problem for the complex Monge-Ampere equation 12.2 Method of elliptic regularization and a priori estimates 12.3 Geodesics in/g and geodesics in/gk References Analytic Aspect of Hamilton's Ricci Flow Xi-Ping Zhu Introduction 1 Short-time existence and uniqueness 2 Curvature estimates 2.1 Shis local derivative estimates 2.2 Preserving positive curvature 2.3 Hamilton-Ivey pinching estimate 2.4 Li-Yau-Hamilton inequality 3 Singularities of solutions 3.1 Can all types of singularities be formed 3.2 Singularity models 3.3 Canonical neighborhood structure 4 Long time behaviors 4.1 The Ricci flow on two-manifolds 4.2 The Ricci flow on three-manifolds 4.3 Differential Sphere Theorems References

《几何分析手册》

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 significant introductions to important topics. This series emphasizes the history and sources of motivation for the topics under discussion, and also gives an overview 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.

《几何分析手册》

版权说明

本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问:www.tushu000.com