

<<几何分析手册>>

图书基本信息

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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.

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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 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 intended 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 Kaihler 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 WeitzenbSck formulas and some almost Kahler identities 5 Seiberg-Witten theory-three facets 5.1 SW equations 5.2 Pin (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 Furutas 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 Homologieal classification 7.4 Further questions 8 References

Lectures on Stability and Constant Scalar Curvature D.H. Phong , Jacob \$turm 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 metrics2.3 The conjecture of Yau3 The analytic problem3.1 Fourth order non-linear PDE and Monge-Ampere equations3.2 Geometric heat flows3.3 Variational formulation and energy functionals4 The spaces K_k of Bergman metrics4.1 Kodaira imbeddings4.2 The Tian-Yau-Zelditch theorem5 The functional $F_0 = 0$ on K_k 5.1 $F_0 = 0$ and balance imbeddings5.2 $F_0 = 0$ and the Euler-Lagrange equation $R-R = 0$ 5.3 $F_0 = 0$ and Monge-Ampere masses6 Notions of stability6.1 Stability in GIT6.2 Donaldsons infinite-dimensional GIT6.3 Stability conditions on $\text{Diff}(X)$ orbits7 The necessity of stability7.1 The Moser-Trudinger inequality and analytic K-stability7.2 Necessity of Chow-Mumford stability7.3 Necessity of semi K-stability8 Sufficient conditions : the Kahler-Einstein case8.1 The χ -invariant8.2 Nadel's multiplier ideal sheaves criterion8.3 The Kahler-Ricci flow9 General L : energy functionals and Chow points9.1 F_0 and Chow points9.2 K_w and Chow points10 General L : the Calabi energy and the Calabi flow10.1 The Calabi flow10.2 Extremal metrics and stability11 General L : toric varieties11.1 Symplectic potentials11.2 K-stability on toric varieties11.3 The K-unstable case12 Geodesics in the space/g of Kahler potentials12.1 The Dirichlet problem for the complex Monge-Ampere equation12.2 Method of elliptic regularization and a priori estimates12.3 Geodesics in/g and geodesics in/gkReferencesAnalytic Aspect of Hamiltons Ricci FlowXi-Ping ZhuIntroduction1 Short-time existence and uniqueness2 Curvature estimates2.1 Shis local derivative estimates2.2 Preserving positive curvature2.3 Hamilton-Ivey pinching estimate2.4 Li-Yau-Hamilton inequality3 Singularities of solutions3.1 Can all types of singularities be formed3.2 Singularity models3.3 Canonical neighborhood structure4 Long time behaviors4.1 The Ricci flow on two-manifolds4.2 The Ricci flow on three-manifolds4.3 Differential Sphere TheoremsReferences

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