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   Soggetti   Atiyah-Singer index theorem
                        Heat equation

   Lingua di pubblicazione   Inglese

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   Nota di contenuto   PREFACE; CONTENTS; DEFINITIONS AND FORMULAS; CHAPTER 1
                        PRELIMINARIES IN RIEMANNIAN GEOMETRY; 1.1 Basic Notions of
                        Riemannian Geometry; 1.2 Computations by using Orthonormal Moving
                        Frame; 1.3 Differential Forms and Orthonormal Moving Frame Method;
                        1.4 Classical Geometric Operators; 1.5 Normal Coordinates; 1.6
                        Computations on Sphere; 1.7 Connections on Vector Bundles and
                        Principal Bundles; 1.8 General Tensor Calculus; CHAPTER 2
                        SCHRODINGER AND HEAT OPERATORS; 2.1 Fundamental Solution and
                        Levi Iteration; 2.2 Existence of Fundamental Solution; 2.3 Cauchy
                        Problem of Heat Equation
                        2.4 Hodge Theorem2.5 Applications of Hodge Theorem; 2.6 Index
                        Problem; CHAPTER 3 MP PARAMETRIX AND APPLICATIONS; 3.1 MP
                        Parametrix; 3.2 Existence of Initial Solutions; 3.3 Asymptotic Expansion
                        for Heat Kernel; 3.4 Local Index for Elliptic Operators; CHAPTER 4
                        CHERN-WEIL THEORY; 4.1 Characteristic Forms and Characteristic
                        Classes; 4.2 General Characteristic Forms; 4.3 Chern Root Algorithm;
                        4.4 Formal Approach to Local Index of Signature Operator; CHAPTER 5
                        CLIFFORD ALGEBRA AND SUPER ALGEBRA; 5.1 Clifford Algebra; 5.2
                        Super Algebra; 5.3 Computations on Supertraces; CHAPTER 6 DIRAC
                        OPERATOR
                        6.1 Spin Structure6.2 Spinor Bundle; 6.3 Dirac Operator; 6.4 Index of

Dirac Operator; CHAPTER 7 LOCAL INDEX THEOREMS; 7.1 Local Index Theorem for Dirac Operator; 7.2 Local Index Theorem for Signature Operator; 7.3 Local Index Theorem for de Rham-Hodge Operator; CHAPTER 8 RIEMANN-ROCH THEOREM; 8.1 Hermitian Metric; 8.2 Hermitian Connection; 8.3 Riemann-Roch Operator; 8.4 Weitzenbock Formula; 8.5 Index Theorem; 8.6 Riemann-Roch Operator in Complex Analysis; REFERENCES; INDEX

| Sommario/riassunto | This book provides a self-contained representation of the local version of the Atiyah-Singer index theorem. It contains proofs of the Hodge theorem, the local index theorems for the Dirac operator and some first order geometric elliptic operators by using the heat equation method. The proofs are up to the standard of pure mathematics. In addition, a Chern root algorithm is introduced for proving the local index theorems, and it seems to be as efficient as other methods. Contents: Preliminaries in Riemannian Geometry; Schrodinger and Heat Operators; MP Parametrix and Applications; Chern-Weil Th |