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Nota di contenuto	Mathematical Analysis of Evolution, Information, and Complexity; Contents; Preface; List of Contributors; Prologue; 1 Weyl's Law; 1.1 Introduction; 1.2 A Brief History of Weyl's Law; 1.2.1 Weyl's Seminal Work in 1911-1915; 1.2.2 The Conjecture of Sommerfeld (1910); 1.2.3 The Conjecture of Lorentz (1910); 1.2.4 Black Body Radiation: From Kirchhoff to Wien's Law; 1.2.5 Black Body Radiation: Rayleigh's Law; 1.2.6 Black Body Radiation: Planck's Law and the Classical Limit; 1.2.7 Black Body Radiation: The Rayleigh-Einstein-Jeans Law; 1.2.8 From Acoustics to Weyl's Law and Kac's Question 1.3 Weyl's Law with Remainder Term. 11.3.1 The Laplacian on the Flat Torus $T(2)$; 1.3.2 The Classical Circle Problem of Gauss; 1.3.3 The Formula of Hardy-Landau-Voronoi; 1.3.4 The Trace Formula on the

Torus $T(2)$ and the Leading Weyl Term; 1.3.5 Spectral Geometry: Interpretation of the Trace Formula on the Torus $T(2)$ in Terms of Periodic Orbits; 1.3.6 The Trace of the Heat Kernel on d -Dimensional Tori and Weyl's Law; 1.3.7 Going Beyond Weyl's Law: One can Hear the Periodic Orbits of the Geodesic Flow on the Torus $T(2)$; 1.3.8 The Spectral Zeta Function on the Torus $T(2)$
1.3.9 An Explicit Formula for the Remainder Term in Weyl's Law on the Torus $T(2)$ and for the Circle Problem 1.3.10 The Value Distribution of the Remainder Term in the Circle Problem; 1.3.11 A Conjecture on the Value Distribution of the Remainder Term in Weyl's Law for Integrable and Chaotic Systems; 1.4 Weyl's Law with Remainder Term. II; 1.4.1 The Laplace-Beltrami Operator on d -Dimensional Compact Riemann Manifolds $M(d)$ and the Pre-Trace Formula; 1.4.2 The Sum Rule for the Automorphic Eigenfunctions on $M(d)$; 1.4.3 Weyl's Law on $M(d)$ and its Generalization by Carleman
1.4.4 The Selberg Trace Formula and Weyl's Law 1.4.5 The Trace of the Heat Kernel on $M(2)$; 1.4.6 The Trace of the Resolvent on $M(2)$ and Selberg's Zeta Function; 1.4.7 The Functional Equation for Selberg's Zeta Function $Z(s)$; 1.4.8 An Explicit Formula for the Remainder Term in Weyl's Law on $M(2)$ and the Hilbert-Polya Conjecture on the Riemann Zeros; 1.4.9 The Prime Number Theorem vs. the Prime Geodesic Theorem on $M(2)$; 1.5 Generalizations of Weyl's Law; 1.5.1 Weyl's Law for Robin Boundary Conditions; 1.5.2 Weyl's Law for Unbounded Quantum Billiards; 1.6 A Proof of Weyl's Formula
1.7 Can One Hear the Shape of a Drum? 1.8 Does Diffusion Determine the Domain?; References; 2 Solutions of Systems of Linear Ordinary Differential Equations; 2.1 Introduction; 2.2 The Exponential Ansatz of Magnus; 2.3 The Feynman-Dyson Series, and More General Perturbation Techniques; 2.4 Power Series Methods; 2.4.1 Regular Points; 2.4.2 Singularities of the First Kind; 2.4.3 Singularities of Second Kind; 2.5 Multi-Summability of Formal Power Series; 2.5.1 Asymptotic Power Series Expansions; 2.5.2 Gevrey Asymptotics; 2.5.3 Asymptotic Existence Theorems; 2.5.4 k -Summability
2.5.5 Multi-Summability

Sommario/riassunto

Mathematical Analysis of Evolution, Information, and Complexity deals with the analysis of evolution, information and complexity. The time evolution of systems or processes is a central question in science, this text covers a broad range of problems including diffusion processes, neuronal networks, quantum theory and cosmology. Bringing together a wide collection of research in mathematics, information theory, physics and other scientific and technical areas, this new title offers elementary and thus easily accessible introductions to the various fields of research addressed in the book.
