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Altri autori (Persone)	IvancevicTijana T
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Nota di contenuto	Preface; Acknowledgments; Contents; 1. Introduction; 1.1 Soft Introduction to Quantum Mechanics; 1.2 Hilbert Space; 1.2.1 Quantum Hilbert Space; 1.2.2 Formal Hilbert Space; 1.3 Human Intelligence, Mind and Reason; 1.3.0.1 Human Reason; 2. Elements of Quantum Mechanics; 2.1 Basics of Non-Relativistic Quantum Mechanics; 2.1.1 Canonical Quantization; 2.1.2 Quantum States and Operators; 2.1.3 Quantum Pictures; 2.1.4 Spectrum of a Quantum Operator; 2.1.5 General Representation Model; 2.1.6 Direct Product Space; 2.1.7 State-Space for n Quantum Particles 2.2 Relativistic Quantum Mechanics and Electrodynamics2.2.1 Difficulties of the Relativistic Quantum Mechanics; 2.2.2 Particles of Half-Odd Integral Spin; 2.2.3 Particles of Integral Spin; 2.2.4 Dirac's Electrodynamics Action Principle; 2.2.5 Dirac Equation and Formal QED in Brief; 2.2.6 Lorentzian Space-Time and Gravity; 2.2.7 Unification of Fundamental Interactions; 2.2.7.1 First Unification; 3. Feynman Path Integrals; 3.1 Path Integrals: Sums Over Histories; 3.1.1 Intuition Behind

a Path Integral; 3.1.1.1 Classical Probability Concept; 3.1.1.2 Quantum Probability Concept
3.1.4 Statistical Mechanics via Path Integrals 3.1.5 Path-Integral Monte-Carlo Simulation; 3.1.6 Sum over Geometries and Topologies; 3.1.6.1 Simplicial Quantum Geometry; 3.1.6.2 Discrete Gravitational Path Integrals; 3.1.6.3 Regge Calculus; 3.1.6.4 Lorentzian Path Integral; 3.2 Dynamics of Quantum Fields; 3.2.1 Path Integrals and Green's Functions; 3.2.2 Topological Quantum Field Theory; 3.2.3 TQFT and Seiberg-Witten Theory; 3.2.3.1 SW Invariants and Monopole Equations; 3.2.3.2 Topological Lagrangian; 3.2.3.3 Quantum Field Theory; 3.2.3.4 Dimensional Reduction and 3D Field Theory
3.2.3.5 Geometrical Interpretation 3.2.4 TQFTs Associated with SW-Monopoles; 3.2.4.1 Dimensional Reduction; 3.2.4.2 TQFTs of 3D Monopoles; 3.2.4.3 Non-Abelian Case; 3.3 Stringy Geometrodynamics; 3.3.1 Stringy Actions and Amplitudes; 3.3.1.1 Strings; 3.3.1.2 Interactions; 3.3.1.3 Loop Topology of Closed Surfaces; 3.3.2 Transition Amplitudes for Strings; 3.3.3 Weyl Invariance and Vertex Operator Formulation; 3.3.4 More General Stringy Actions; 3.3.5 Transition Amplitude for a Single Point Particle; 3.3.6 Witten's Open String Field Theory; 3.3.6.1 Operator Formulation of String Field Theory
3.3.6.2 Open Strings

Sommario/riassunto

This is a unique 21st-century monograph that reveals a basic, yet deep understanding of the universe, as well as the human mind and body - all from the perspective of quantum mechanics and quantum field theory. This book starts with both non-mathematical and mathematical preliminaries. It presents the basics of both non-relativistic and relativistic quantum mechanics, and introduces Feynman path integrals and their application to quantum fields and string theory, as well as some non-quantum applications. It then describes the quantum universe in the form of loop quantum gravity and quantum cosm
