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Nota di contenuto	Intro -- Table of Contents -- A preface of prefaces -- Introduction -- Nature is quantized -- Physics, mathematics and concepts -- I The journey: from classical to quantum worlds -- I.1 The gems of classical physics -- Mission almost completed -- Newtonian mechanics and gravity -- Four laws only -- Dynamical systems -- Conservation lawssubjectsI]Conservation laws -- Classical mechanics for aficionados -- grey The shortest path -- Maxwell's electromagnetism -- The Maxwell equations -- Electromagnetic wavessubjectsI]Electromagnetic waves -- Lorentz invariance: the key to relativity -- Gauge invariance: beauty and redundance -- Monopoles: Nature's missed opportunity? -- Statistical Physics: from micro to macro physics -- Thermodynamics: the three laws -- Understanding entropy. -- grey Two cultures -- Statistical mechanics -- Statistical thermodynamics. -- The ideal gas. -- I.2 The age of geometry, information and quantum -- Canaries in a coal mine -- The physics of space-time -- Special relativity -- General relativity -- Big Bang cosmology -- Cosmic inflation -- grey Much ado about nothing -- The physics of geometry -- Curved spaces (manifolds) and topology -- The geometry of gauge invariance -- The physics of information: from bits to qubits -- Information and entropy -- Models of computation -- Going quantum -- Quantum physics: the laws of matter -- I.3 Universal constants, scales and units -- Is man the measure of all things? -- On time -- Reinventing the meter -- grey

When the saints go marching in... -- How universal is universal? -- Theories outside their comfort zone -- The virtue of heuristics -- Going quantum -- Natural units ©1898 Max Planck -- Black holes -- Black hole thermodynamics -- Accelerated observers and the Unruh effect -- The magic cube -- I.4 The quest for basic building blocks -- A splendid race to the bottom. Fatal attraction: forces yield structure -- Atomic structure -- The Bohr atom: energy quantization -- The Schrödinger atom[subjects] Schrödinger atom: three numbers -- The discovery of spin -- grey Behind the scenes -- Fermions and bosons -- Atoms: the building blocks of chemistry -- Nuclear structure -- Isotopes and nuclear decay modes -- Positron-emission tomography (PET) -- Transmutation: Fission and fusion -- grey Chysopoeia? -- ITER: the nuclear fusion reactor -- Field theory: particle species and forces -- The Dirac equation: matter and anti-matter -- Quantum Electrodynamics: QED -- Subnuclear structure -- The Standard Model -- Flavors, colors and families -- The strong interactions -- The electro-weak interactions -- A brief history of unification. -- Supersymmetry -- Superstrings -- Strings: all fields in one? -- M-theory, D-branes and dualities -- Holography and the AdS/CFT program -- At home in the quantum world -- Indices -- Subject index Volume I -- Name index Volume I -- II Quantessence: how quantum theory works -- Contents -- III Hierarchies: the emergence of diversity -- Contents -- Appendix A Math Excursions -- Appendix B Chronologies, ideas and people -- Indices -- Acknowledgements -- About the Author:.

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## Sommario/riassunto

Quantum Physics is the solid basis of most of our understanding of nature and has been the driver of many technological advances. The trilogy *Power of the Invisible: The Quantessence of Reality* gives a coherent account of this huge domain of knowledge, which is linked to some fifty Nobel prizes and is one of the greatest scientific achievements of the twentieth century. This quantum story follows three lines in parallel: a pictorial, an explanatory and a mathematical one.

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