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Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Nota di contenuto	Part I Gravity and Prague -- Kepler and Mach's Principle -- Einstein in Prague: Relativity Then and Now -- Part II Classical General Relativity -- Observers, observables and measurements in general relativity -- Some links between general relativity and other parts of physics -- The General Relativistic Two Body Problem and the Effective One Body Formalism -- Gravitational self-force: orbital mechanics beyond geodesic motion -- Hamiltonian formalism for spinning black holes in general relativity -- Stability of marginally outer trapped surfaces and geometric inequalities -- Stationary black-hole binaries: A non-existence proof -- Dynamic and Thermodynamic Stability of Black Holes and Black Branes -- Instability of anti-de Sitter spacetime -- Higher-dimensional black holes -- Black holes, hidden symmetry and complete integrability: Brief Review -- Part III Cosmology and Quantum

Gravity -- Cosmological models and stability -- Inflation and Birth of
Cosmological Perturbations -- Loop Quantum Gravity and The Planck
Regime of Cosmology -- The inflationary origin of the seeds of cosmic
structure: quantum theory and the need for novel physics -- Quantum
Gravity: The view from particle physics -- Part IV Numerical Relativity
and Relativistic Astrophysics -- Three little pieces for computer and
relativity -- Instabilities of Relativistic Stars -- Gravity talks: observing
the universe with gravitational waves -- LISA in 2012 and beyond – 20
years after the first proposal -- Einstein's gravity as seen by a cosmic
lighthouse keeper -- The astrophysical signatures of black holes: the
horizon, the ISCO, the ergosphere and the light circle -- Energy
Extraction from Spinning Black Holes via Relativistic Jets.

Sommario/riassunto

The articles included in this Volume represent a broad and highly qualified view on the present state of general relativity, quantum gravity, and their cosmological and astrophysical implications. As such, it may serve as a valuable source of knowledge and inspiration for experts in these fields, as well as an advanced source of information for young researchers. The occasion to gather together so many leading experts in the field was to celebrate the centenary of Einstein's stay in Prague in 1911-1912. It was in fact during his stay in Prague that Einstein started in earnest to develop his ideas about general relativity that fully developed in his paper in 1915. Approaching soon the centenary of his famous paper, this volume offers a precious overview of the path done by the scientific community in this intriguing and vibrant field in the last century, defining the challenges of the next 100 years. The content is divided into four broad parts: (i) Gravity and Prague, (ii) Classical General Relativity, (iii) Cosmology and Quantum Gravity, and (iv) Numerical Relativity and Relativistic Astrophysics.
