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Nota di contenuto   Part I. Fundamental ideas and general formalisms. Unfinished revolution / C. Rovelli ; The fundamental nature of space and time / G. 't Hooft ; Does locality fail at intermediate length scales / R.D. Sorkin ; Prolegomena to any future quantum gravity / J. Stachel ; Spacetime symmetries in histories canonical gravity / N. Savvidou ; Categorical geometry and the mathematical foundations of quantum gravity / L. Crane ; Emergent relativity / O. Dreyer ; Asymptotic safety / R. Percacci ; New directions in background independent quantum gravity / F. Markopoulou -- Part II. String/M-theory. Gauge/gravity duality / G. Horowitz and J. Polchinski ; String theory, holography and quantum gravity / T. Banks ; String field theory / W. Taylor -- Part III. Loop quantum gravity and spin foam models. Loop quantum gravity / T. Thiemann ; Covariant loop quantum gravity? / E. Livine ; The spin foam

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| Sommario/riassunto | The theory of quantum gravity promises a revolutionary new understanding of gravity and spacetime, valid from microscopic to cosmological distances. Research in this field involves an exciting blend of rigorous mathematics and bold speculations, foundational questions and technical issues. Containing contributions from leading researchers in this field, this book presents the fundamental issues involved in the construction of a quantum theory of gravity and building up a quantum picture of space and time. It introduces the most current approaches to this problem, and reviews their main achievements. Each part ends in questions and answers, in which the contributors explore the merits and problems of the various approaches. This book provides a complete overview of this field from the frontiers of theoretical physics research for graduate students and researchers. |