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Nota di contenuto	Part I: Theoretical Models Beyond Special and General Relativity -- Chapter 1. Lorentz Symmetry Violation in String-Inspired Effective Modified Gravity Theories -- Chapter 2. Deformed Relativistic Symmetry Principles -- Chapter 3. Poincaré Gauge Gravity Primer -- Chapter 4. Teleparallel Gravity -- Chapter 5. Gravitational Lensing in Theories with Lorentz Invariance Violation -- Part II: Observational Effects Beyond Special and General Relativity: From Cosmic Scales, via Compact Objects to the Lab -- Chapter 6. Cosmic Searches for Lorentz Invariance Violation -- Chapter 7. Neutron Stars -- Chapter 8. Black Holes: On the Universality of the Kerr Hypothesis -- Chapter 9. Probing the Horizon of Black Holes with Gravitational Waves -- Chapter 10. Boson Stars -- Chapter 11. Stellar and Substellar Objects in Modified Gravity -- Chapter 12. Radio Pulsars as a Laboratory for Strong-Field Gravity Tests -- Chapter 13. Testing Gravity and Predictions Beyond the

Standard Model at Short Distances: The CasimirEffect -- Part III: Quantum Systems and Gravity -- Chapter 14. Quantum Tests of Gravity -- Chapter 15. The Gravity of Light -- Chapter 16. Coupling Quantum Matter and Gravity.

Sommario/riassunto

This book discusses theoretical predictions and their comparison with experiments of extended and modified classical and quantum theories of gravity. The goal is to provide a readable access and broad overview over different approaches to the topic to graduate and PhD students as well as to young researchers. The book presents both, theoretical and experimental insights and is structured in three parts. The first addresses the theoretical models beyond special and general relativity such as string theory, Poincare gauge theory and teleparallelism as well as Finsler gravity. In turn, the second part is focused on the observational effects that these models generate, accounting for tests and comparisons which can be made on all possible scales: from the universe as a whole via binary systems, stars, black holes, satellite experiments, down to laboratory experiments at micrometer and smaller scales. The last part of this book is dedicated to quantum systems and gravity, showing tests of classical gravity with quantum systems, and coupling of quantum matter and gravity.