1. Record Nr. UNISA996485572603316

Autore	Ricci Fulvio
Titolo	Experimental Gravitation [[electronic resource] /] / by Fulvio Ricci, Massimo Bassan
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2022
ISBN	3-030-95596-6
Edizione	[1st ed. 2022.]
Descrizione fisica	1 online resource (446 pages)
Collana	Lecture Notes in Physics, , 1616-6361 ; ; 998
Disciplina	531.14
Soggetti	Gravitation Quantitative research Physics Classical and Quantum Gravity Gravitational Physics Data Analysis and Big Data Applied and Technical Physics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Classical Gravity -- Keplerian dynamics; Multipole expansion -- Tides -- Active, passive mass. -Torsion Pendulum: the oldest physics experimental tool, operation, strategies, analytic model -- The Equivalence Principle: Weak, Einstein and strong EP, experimental tests. - Principles of metric theories: LLI and LPI and experimental verifications; the red shift -- Schiff's conjecture -- Gravity Tests at 1PN: recap of GR equations -- WFSM approximation, classical tests of GR -- Gravitoelectromagnetism and its tests -- Gravity and PPN -- The PPN formulation of metric theories -- Solar System tests and limits on PPN parameters -- Gravitational Waves (GW): GW in GR and in other theories; emission; sources; signals -- GW Detectors: Interferometers -- Data Analysis -- Pulsars and GR -- Space detectors of GW Sagnac effect. GPS. Modulation. Feedback. FabryPerot.
Sommario/riassunto	This book features a comprehensive review of experimental gravitation. It is a textbook based on the graduate courses on “Experimental Gravitation” given by the authors at their respective universities in

Rome: Sapienza and Tor Vergata. A number of different research topics in the field are covered: from the torsion pendulum (still today the tool of choice for measuring small forces or torques) to the large interferometers developed to observe gravitational waves. Techniques that are still under development are also discussed, like the pulsar timing array and space-based detectors of the future. This book is written by experimentalists for experimentalists. While the background physics is summarized for less experienced readers, the emphasis is certainly on experimental verifications: the strategy, the apparatuses, the data analysis and the results of many cornerstone experiments are analyzed and discussed in depth. This textbook serves as a useful resource for both graduate students and professionals working in the increasingly vibrant field of experimental gravity.