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   Nota di contenuto   Front matter -- List of contributors -- Contents -- Preface -- The
                        general relativistic two-body problem / Thibault, Damour --
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                        Newtonian approximations / Schäfer, Gerhard -- Covariant theory of
                        the post-Newtonian equations of motion of extended bodies / Xie, Yi /
                        Sergei, Kopeikin -- On the DSX-framework / Soffel, Michael -- General
                        relativistic theory of light propagation in multipolar gravitational fields
                        / Korobkov, Pavel / Kopeikin, Sergei -- On the backreaction problem in
                        cosmology / Futamase, Toshifumi -- Post-Newtonian approximations
                        in cosmology / Petrov, Alexander / Kopeikin, Sergei -- Index

   Sommario/riassunto   Relativistic celestial mechanics - investigating the motion celestial
                        bodies under the influence of general relativity - is a major tool of
                        modern experimental gravitational physics. With a wide range of
                        prominent authors from the field, this two-volume series consists of
                        reviews on a multitude of advanced topics in the area of relativistic
                        celestial mechanics - starting from more classical topics such as the
                        regime of asymptotically-flat spacetime, light propagation and celestial
                        ephemerides, but also including its role in cosmology and alternative

theories of gravity as well as modern experiments in this area. This first volume of a two-volume series is concerned with theoretical foundations such as post-Newtonian solutions to the two-body problem, light propagation through time-dependent gravitational fields, as well as cosmological effects on the movement of bodies in the solar systems. On the occasion of his 80-th birthday, these two volumes honor V. A. Brumberg - one of the pioneers in modern relativistic celestial mechanics. Contributions include: M. Soffel: On the DSX-framework T. Damour: The general relativistic two body problem G. Schaefer: Hamiltonian dynamics of spinning compact binaries through high post-Newtonian approximations A. Petrov and S. Kopeikin: Post-Newtonian approximations in cosmology T. Futamase: On the backreaction problem in cosmology Y. Xie and S. Kopeikin: Covariant theory of the post-Newtonian equations of motion of extended bodies S. Kopeikin and P. Korobkov: General relativistic theory of light propagation in multipolar gravitational fields