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Sommario/riassunto	General Relativity is a theory proposed by Einstein in 1915 as a unified theory of space, time and gravitation. It is based on and extends Newton's theory of gravitation as well as Newton's equations of motion. It is thus fundamentally rooted in classical mechanics. The theory can be seen as a development of Riemannian geometry, itself an extension of Gauss' intrinsic theory of curved surfaces in Euclidean space. The domain of application of the theory is astronomical systems. One of the mathematical methods analyzed and exploited in the present volume is an extension of Noether's fundamental principle connecting symmetries to conserved quantities. This is involved at a most elementary level in the very definition of the notion of hyperbolicity for an Euler-Lagrange system of partial differential equations. Another method is the study and systematic use of foliations by characteristic (null) hypersurfaces, and is in the spirit of the approach of Roger Penrose in his incompleteness theorem. The methods have applications beyond general relativity to problems in fluid mechanics and, more generally, to the mechanics and electrodynamics of continuous media. The book is intended for advanced students and researchers seeking an introduction into the methods and applications of general relativity.