The book contains seven chapters and a mathematical appendix. The first two chapters review a historical background of relativity. Chapter 3 centers on Einstein's first Relativity paper of 1905. Subsequent chapters present the Minkowskian formulation of special relativity. Chapters 5 and 6 deal with Einstein's search for general relativity from 1907 to 1915, as well as some aspects and subsequent developments of the theory. The last chapter explores the concept of simultaneity, geometric conventionalism, and a few other questions concerning space time structure, causality, and time.

A Student's Guide to General Relativity - Norman Gray 2019-01-03

Vectors, tensors and functions -- Manifolds, vectors and differentiation -- Energy, momentum and Einstein's equations

General Relativity - N.M.J. Woodhouse 2007-03-06

Based on a course taught for years at Oxford, this book offers a concrete exposition of the central ideas of general relativity. The focus is on the chain of reasoning that leads to the relativistic theory from the analysis of distance and time measurements in the presence of gravity, rather than on the underlying mathematical structure. Includes links to recent developments, including theoretical work and observational evidence, to encourage further study.

Geometric Theory of Generalized Functions with Applications to General Relativity - M. Grosser 2013-04-17

Over the past few years a certain shift of focus within the theory of algebras of generalized functions has taken place. Originating in infinite dimensional analysis and initially applied mainly to problems in nonlinear partial differential equations involving singularities, the theory has undergone a change both in internal structure and scope of applicability, due to a growing number of applications to questions of a more geometric nature. The present book is intended to provide an in-depth presentation of these developments concerning its structural aspects within the theory of generalized functions as well as a (sufficient but not large) representative set of applications. The main purpose of the book is accompanied by a number of small exercises which are meant to help the reader to absorb the material included here. First, despite the fact that by now several excellent monographs on Colombeau algebras are available, we have decided to give a self-contained introduction to the field in Chapter 1. Our motivation for this decision stems from two features of Colombeau algebras. On the one hand, in contrast to other treatments of the subject we have made our introduction to the field as self-contained as possible, even if it means a somewhat general account of the field particularly in the earlier chapters.

General Relativity - Norbert Straumann 2013-11-11

The foundations are thoroughly developed together with the required mathematical background from differential geometry developed in Part III. The author also discusses the tests of general relativity in detail, including binary pulsars, with much space is devoted to the study of compact objects, especially to neutron stars and to the basic laws of black hole physics. This well-structured text and reference enables readers to easily navigate through the various sections on best match their backgrounds and perspectives, whether mathematical, physical or astronomical. Very applications oriented, the text includes very recent results, such as the supermassive black-hole in our galaxy and first double pulsar system.