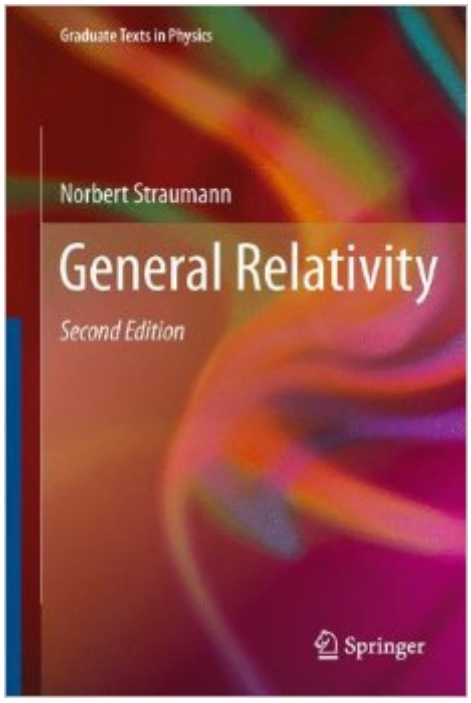
General Relativity (Graduate Texts In Physics)



Synopsis

This book provides a completely revised and expanded version of the previous classic edition â ˆGeneral Relativity and Relativistic Astrophysicsâ ™. In Part I the foundations of general relativity are thoroughly developed, while Part II is devoted to tests of general relativity and many of its applications. Binary pulsars â “ our best laboratories for general relativity â “ are studied in considerable detail. An introduction to gravitational lensing theory is included as well, so as to make the current literature on the subject accessible to readers. Considerable attention is devoted to the study of compact objects, especially to black holes. This includes a detailed derivation of the Kerr solution, Israelâ ™s proof of his uniqueness theorem, and a derivation of the basic laws of black hole physics. Part II ends with Wittenâ ™s proof of the positive energy theorem, which is presented in detail, together with the required tools on spin structures and spinor analysis. In Part III, all of the differential geometric tools required are developed in detail. A great deal of effort went into refining and improving the text for the new edition. New material has been added, including a chapter on cosmology. The book addresses undergraduate and graduate students in physics, astrophysics and mathematics. It utilizes a very well structured approach, which should help it continue to be a standard work for a modern treatment of gravitational physics. The clear presentation of differential geometry also makes it useful for work on string theory and other fields of physics, classical as well as quantum.

Book Information

Series: Graduate Texts in Physics

Hardcover: 736 pages

Publisher: Springer; 2nd ed. 2013 edition (October 9, 2012)

Language: English

ISBN-10: 9400754094

ISBN-13: 978-9400754096

Product Dimensions: 6.1 x 1.6 x 9.2 inches

Shipping Weight: 2.8 pounds (View shipping rates and policies)

Average Customer Review: 4.7 out of 5 starsÂ Â See all reviewsÂ (3 customer reviews)

Best Sellers Rank: #1,254,309 in Books (See Top 100 in Books) #169 inÂ Books > Science & Math > Physics > Gravity #892 inÂ Books > Science & Math > Physics > Mathematical Physics #1235 inÂ Books > Textbooks > Science & Mathematics > Astronomy & Astrophysics

Customer Reviews

This book is an extensive revision and expansion of Dr. Straumann’s earlier book, General Relativity with Applications to Astrophysics (2004). The new version contains an additional 61 pages which are accounted for by revisions and additions throughout the text and the inclusion of an entirely new Chapter 10 on Friedmann-Lemaitre cosmological models. As Straumann remarks in the Preface, the new text represents such a thorough revision of the 2004 work that it cannot be considered merely a new edition.Straumann’s book joins the roster of a number of currently available introductions to general relativity written for the beginning graduate student: a list of authors for some of the more popular books includes Wald, Carroll, Ohanian & Ruffini, Stephani, Ryder, Plebanski & Krasinski, Choquet-Bruhat, Rindler, and Gron & Hervik, among others. And of course, many students are still drawn to the venerable book Gravitation by Misner, Thorne & Wheeler.How is one to choose intelligently from among these references? Is there anything that recommends one book over all the others? Those of us who study mathematics and physics independently are drawn to books that appeal to us on an individual level--books that fit our background preparation, our goals for independent study, and our unique learning style. There is seldom one single text for an advanced topic such as GR that is "the best" resource for every potential reader. With that in mind, I would suggest that Straumann’s book will appeal very strongly to any reader who fits the following profile. He/she is mathematically sophisticated and appreciates seeing the mathematics of general relativity done with the same kind of rigor that mathematicians routinely demand in their advanced courses.

Century of Geniuses and the Battle over General Relativity Relativity: The Special and the General Theory Books of Breathing and Related Texts -Late Egyptian Religious Texts in the British Museum Vol.1 (Catalogue of the Books of the Dead and Other Religious Texts in the British Museum) Electrodynamics: The Field-Free Approach: Electrostatics, Magnetism, Induction, Relativity and Field Theory (Undergraduate Lecture Notes in Physics) How Consciousness Became the Universe:: Quantum Physics, Cosmology, Relativity, Evolution, Neuroscience, Parallel Universes Fundamentals of Physics: Mechanics, Relativity, and Thermodynamics (The Open Yale Courses Series) Theoretical Physics 4: Special Theory of Relativity Insider's Guide to Graduate Programs in Clinical and Counseling Psychology (Insider's Guide to Graduate Programs in Clinical & Counseling Psychology)