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Modern General Relativity - Mike Guidry - 2019-01-03
Einstein's general theory of relativity is widely considered to be one of the most elegant and successful scientific theories ever developed, and it is increasingly being taught in a simplified form at advanced undergraduate level within both physics and mathematics departments. Due to the increasing interest in gravitational physics, in both the academic and the public sphere, driven largely by widely-publicised developments such as the recent observations of gravitational waves, general relativity is also one of the most popular scientific topics pursued through self-study. Modern General Relativity introduces the reader to the general theory of relativity using an example-based approach, before describing some of its most important applications in cosmology and astrophysics, such as gamma-ray bursts, neutron stars, black holes, and gravitational waves. With hundreds of worked examples, explanatory boxes, and end-of-chapter problems, this
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General Relativity And Gravitational Physics - Proceedings Of The 11th Italian Conference - Carfora Mauro - 1996-08-30

Relativity, Gravitation and Cosmology - Ta-Pei Cheng - 2010-01

This book provides an introduction to Einstein’s general theory of relativity. A “physics-first” approach is adopted so that interesting applications come before the more difficult task of solving the Einstein equation. The book includes extensive coverage of cosmology, and is designed to allow readers to study the subject alone.

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Gravitation - Charles W. Misner - 2017-10-24

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 as best matches 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

**Gravity from the Ground Up** - Bernard Schutz - 2003-12-04

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**Elements of General Relativity** - Piotr T. Chruściel - 2020-03-19

This book provides an introduction to the mathematics and physics of general relativity, its basic physical concepts, its observational implications, and the new insights obtained into the nature of space-time and the structure of the universe. It introduces some of the most striking aspects of Einstein's theory of gravitation: black holes, gravitational waves, stellar models, and cosmology. It contains a self-contained introduction to tensor calculus and Riemannian geometry, using in parallel the language of modern differential geometry and the coordinate notation, more familiar to physicists. The author has strived to achieve mathematical rigour, with all notions given careful mathematical meaning, while trying to maintain the formalism to the minimum fit-for-purpose. Familiarity with special relativity is assumed. The overall aim is to convey some of the main physical and geometrical properties of Einstein's theory of gravitation, providing a solid entry point to further studies of the mathematics and physics of Einstein equations.

This authoritative volume provides a snapshot of the state of the art in gravitational physics and related mathematical fields, as well as a review of recent achievements and prospects for future work. With contributing authors among the world leaders in their respective fields, this proceedings volume is a worthy addition to this conference series, which constitutes one of the most important international meetings in the areas general relativity and gravitation. Contents: Towards Detection of Gravitational Waves (B. C. Teoh)Black Holes and the Information Paradox (S. Hawking)Probing General Relativity on Sub-Minute Timescales (K. Kundic)Revisiting Superstrings Revisited (J. Polchinski)Black Holes in Active Galactic Nuclei (M. Rees)Methods, Twisters, and Countless Variables (J. Lewandowski)Early Universe (M. Sasaki)Dark Energy and the Cosmological Constant (V. Sahni)Gravitational Wave Sources: Science Source and Statistical Methods (A. Buonanno)Detector Performance, Operation, and Commissioning (E. Combalia)Laboratory and Observational Tests of Gravitational Theories (J. H. Gundlach)Quantum Field Theory on Curved Spacetime (K. Fredenhagen) and other papers Readings: Researchers and academics in astrophysics, astronomy, cosmology, quantum physics, theoretical physics and mathematical physics.

**General Relativity and Gravitation** - Petros Florides - 2005-11-07

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Keywords: Gravitation; General Relativity; Cosmology; Quantum Gravity; Numerical Relativity; Astrophysics; String Theory; Key Features: Includes the latest developments in all areas of gravitational physics Contributions by world-leading researchers in the field Continues the high standard of the general relativity conference proceedings series Reviews: "...this volume provides a nice summary of a considerable portion of general relativity just after the turn of the century...It contains some thought-provoking articles as well as some useful, thoughtful reviews." General Relativity and Gravitation.

Formulations of General Relativity - Kirill Krasnov - 2020-11-26
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General Relativity - Michael J W Hall - 2018-03-23
This book is based on a set of 18 class-tested lectures delivered to fourth-year physics undergraduates at Griffith University in Brisbane, and the book presents new discoveries by the Nobel-prize winning LIGO collaboration. The author begins with a review of special relativity and tensors and then develops the basic elements of general relativity (a beautiful theory that unifies special relativity and gravity via geometry) with applications to the gravitational deflection of light, global positioning systems, black holes, gravitational waves, and cosmology. The book provides readers with a solid understanding of the underlying physical concepts; an ability to appreciate and in many cases derive important applications of the theory; and a solid grounding for those wishing to pursue their studies further. General Relativity: An Introduction to Gravitational Waves and Cosmology also connects general relativity with broader topics. There is no doubt that general relativity is an active and exciting field of physics, and this book successfully transmits that excitement to readers.
General Relativity and Gravitation - B. Bertotti - 2012-12-06

The Tenith International Conference on General Relativity and Gravitation (GR10) was held from July 3 to July 8, 1983, in Padova, Italy. These conferences take place every three years, under the auspices of the International Society on General Relativity and Gravitation, in order to assess the current research in the field, critically discussing the progress made and disclosing the points of paramount importance. The conference was addressed by invited speakers on general relativity and gravitation via geometry and applications to the gravitational deflection of light, global positioning systems, black holes, and cosmology. The book includes recent advances in gravitational wave astronomy and provides a general overview of current lines of research in gravity. It also includes numerous examples and problems in each chapter.

Introduction to General Relativity - Cosimo Bambi - 2018-06-18

Following the approach of Lev Landau and Evgenii Lifshitz, this book introduces the theory of special and general relativity with the Lagrangian formalism and the principle of least action. This method allows the complete theory to be constructed starting from a small number of assumptions, and is the most natural approach in modern theoretical physics. The book begins by reviewing Newtonian mechanics and Newtonian gravity with the Lagrangian formalism and the principle of least action, and then moves to special and general relativity. Most calculations are presented step by step, as is done on the board in class. The book covers recent advances in gravitational wave astronomy and provides a general overview of current lines of research in gravity.
The quick-paced style is balanced by over 75 exercises (including full solutions), allowing readers to test and consolidate their understanding.

Topics in the Foundations of General Relativity and Newtonian Gravitation Theory - David B. Malament - 2012-04-02
In Topics in the Foundations of General Relativity and Newtonian Gravitation Theory, David B. Malament presents the basic logical-mathematical structure of general relativity and considers a number of special topics concerning the foundations of general relativity and its relation to Newtonian gravitation theory. These special topics include the geometrized formulation of Newtonian theory (also known as Newton-Cartan theory), the concept of rotation in general relativity, and Gödel spacetime. One of the highlights of the book is a no-go theorem that can be understood to show that there is no criterion of orbital rotation in general relativity that fully answers to our classical intuitions. Topics is intended for both students and researchers in mathematical physics and philosophy of science.

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Proceedings of the 16th International Conference on General Relativity & Gravitation - Nigel Bishop - 2002
The 16th conference of the International Society on General Relativity and Gravitation (GR16), held at the International Convention Centre in Durban, South Africa, from 15 to 21 July, was attended by 450 delegates from around the world. The scientific programme comprised 18 plenary lectures, 1 public lecture and 19 workshops which, excepting 3 plenary lectures, are presented in this proceedings. It was the first major international conference on general relativity and gravitation held on the African continent.

Relativity, Gravitation and Cosmology - Robert J. Lambourne - 2010-06
The textbook introduces students to basic geometric concepts, such as metrics, connections and curvature, before examining general relativity in more detail. It shows the observational evidence supporting the theory, and the description general relativity provides of black holes and cosmological spacetimes.

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