

Relativity Simply Explained Dover Classics Of Science Mathematics

The book presents the theory of relativity as a unified whole. By showing that the concepts of this theory are interrelated to form a unified totality David Bohm supplements some of the more specialist courses which have tended to give students a fragmentary impression of the logical and conceptual nature of physics as a whole.

The 126 poems in this superb collection of 19th and 20th century British and American verse range from famous poets such as Wordsworth, Tennyson, Whitman, and Frost to less well-known poets. Includes 10 selections from the Common Core State Standards Initiative.

A prominent popular science writer presents simple instructions for 100 illustrated experiments. Memorable, easily understood experiments illuminate principles related to astronomy, chemistry, physiology, psychology, mathematics, topology, probability, acoustics, other areas.

Written by a Nobel Prize physicist and his colleague, this compelling book uses familiar objects (trains, rulers, clocks) to illuminate the more subtle aspects of relativity. 23 illustrations. 1959 edition.

Semi-technical account includes a review of classical physics (origin of space and time measurements, Ptolemaic and Copernican astronomy, laws of motion, inertia, more) and of Einstein's theories of relativity.

Radiative Processes in Astrophysics: This clear, straightforward, and fundamental introduction is designed to present-from a physicist's point of view-radiation processes and their applications to astrophysical phenomena and space science. It covers such topics as radiative transfer theory, relativistic covariance and kinematics, bremsstrahlung

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radiation, synchrotron radiation, Compton scattering, some plasma effects, and radiative transitions in atoms. Discussion begins with first principles, physically motivating and deriving all results rather than merely presenting finished formulae. However, a reasonably good physics background (introductory quantum mechanics, intermediate electromagnetic theory, special relativity, and some statistical mechanics) is required. Much of this prerequisite material is provided by brief reviews, making the book a self-contained reference for workers in the field as well as the ideal text for senior or first-year graduate students of astronomy, astrophysics, and related physics courses. Radiative Processes in Astrophysics also contains about 75 problems, with solutions, illustrating applications of the material and methods for calculating results. This important and integral section emphasizes physical intuition by presenting important results that are used throughout the main text; it is here that most of the practical astrophysical applications become apparent.

Gravity is one of the four fundamental interactions that exist in nature. Understanding gravity is not only essential for understanding the motion of objects on Earth, but also the motion of all celestial objects, and even the expansion of the Universe itself. In this book George Gamow takes an enlightening look at three scientists whose work unlocked many of the mysteries behind the laws of physics: Galileo, the first to examine closely the process of free and restricted fall; Newton, originator of a universal force; and Einstein, who proposed that gravity is no more than the curvature of the four-dimensional space-time continuum. The author has illustrated the book himself with some technical fanciful drawings.

Explore the laws and theories of physics in this accessible introduction to the forces that shape our universe, our planet,

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and our everyday lives. Using a bold, graphics-led approach, *The Physics Book* sets out more than 80 of the key concepts and discoveries that have defined the subject and influenced our technology since the beginning of time. With the focus firmly on unpacking the thought behind each theory—as well as exploring when and how each idea and breakthrough came about—five themed chapters examine the history and developments in specific areas such as Light, Sound, and Electricity. Eureka moments abound: from Archimedes' bathtub discoveries about displacement and density, and Galileo's experiments with spheres falling from the Tower of Pisa, to Isaac Newton's apple and his conclusions about gravity and the laws of motion. You'll also learn about Albert Einstein's revelations about relativity; how the accidental discovery of cosmic microwave background radiation confirmed the Big Bang theory; the search for the Higgs boson particle; and why most of the universe is missing. If you've ever wondered exactly how physicists formulated—and proved—their abstract concepts, *The Physics Book* is the book for you. **Series Overview:** Big Ideas Simply Explained series uses creative design and innovative graphics along with straightforward and engaging writing to make complex subjects easier to understand. With over 7 million copies worldwide sold to date, these award-winning books provide just the information needed for students, families, or anyone interested in concise, thought-provoking refreshers on a single subject.

Famed puzzle expert explains math behind a multitude of mystifying tricks: card tricks, stage "mind reading," coin and match tricks, counting out games, geometric dissections, etc. More than 400 tricks. 135 illustrations. Popular physics primer by an acclaimed author offers accessible, imaginative explanations of string theory, the

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Schrödinger's Cat paradox, quantum uncertainty, black holes, and other cosmic oddities. Numerous playful illustrations.

Fair, witty appraisal of cranks, quacks, and quackeries of science and pseudoscience: hollow earth, Velikovsky, orgone energy, Dianetics, flying saucers, Bridey Murphy, food and medical fads, and much more.

With this reader-friendly book, it doesn't take an Einstein to understand the theory of relativity and its remarkable consequences. In clear, understandable terms, physicist Richard Wolfson explores the ideas at the heart of relativity and shows how they lead to such seeming absurdities as time travel, curved space, black holes, and new meaning for the idea of past and future.

Drawing from years of teaching modern physics to nonscientists, Wolfson explains in a lively, conversational style the simple principles underlying Einstein's theory.

Relativity, Wolfson shows, gave us a new view of space and time, opening the door to questions about their flexible nature: Is the universe finite or infinite? Will it expand forever or eventually collapse in a "big crunch"? Is time travel possible? What goes on inside a black hole? How does gravity really work? These questions at the forefront of twenty-first-century physics are all rooted in the profound and sweeping vision of Albert Einstein's early twentieth-century theory. Wolfson leads his readers on an intellectual journey that culminates in a universe made almost unimaginably rich by the principles that Einstein first discovered.

A noted author defends his personal attitudes toward the fundamental issues of classical philosophy, discussing

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the awesome mystery surrounding science and life and explaining why he considers himself a theist. Amusing, irreverent, sophisticated and highly accessible, *Einstein for Beginners* is the perfect introduction to Einstein's life and thought. Reaching back as far as Babylon (for the origins of mathematics) and the Etruscans (who thought they could handle lightning), this book takes us through the revolutions in electrical communications and technology that made the theory of relativity possible. In the process, we meet scientific luminaries and personalities of imperial Germany, as well as Galileo, Faraday, and Newton; learn why moving clocks run slower than stationary ones, why nothing can go faster than the speed of light; and follow Albert's thought as he works his way toward $E = mc^2$, the most famous equation of the twentieth century.

This book contains the great physicist's own explanation of both the special and general theories of relativity. Written for readers interested in the theory but not conversant with the mathematical apparatus of theoretical physics, it presents the ideas in their simplest, most intelligible form.

"Wald's book is clearly the first textbook on general relativity with a totally modern point of view; and it succeeds very well where others are only partially successful. The book includes full discussions of many problems of current interest which are not treated in any extant book, and all these matters are considered with perception and understanding."—S. Chandrasekhar "A tour de force: lucid, straightforward, mathematically rigorous, exacting in the analysis of the theory in its

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physical aspect."—L. P. Hughston, Times Higher Education Supplement "Truly excellent. . . . A sophisticated text of manageable size that will probably be read by every student of relativity, astrophysics, and field theory for years to come."—James W. York, Physics Today

The late "Scientific American" columnist who published books on topics ranging from magic and math to philosophy and religion chronicles his life, from his childhood to his service in the Navy to his varied professional pursuits.

This work has been selected by scholars as being culturally important and is part of the knowledge base of civilization as we know it. This work is in the public domain in the United States of America, and possibly other nations. Within the United States, you may freely copy and distribute this work, as no entity (individual or corporate) has a copyright on the body of the work. Scholars believe, and we concur, that this work is important enough to be preserved, reproduced, and made generally available to the public. To ensure a quality reading experience, this work has been proofread and republished using a format that seamlessly blends the original graphical elements with text in an easy-to-read typeface. We appreciate your support of the preservation process, and thank you for being an important part of keeping this knowledge alive and relevant.

Second edition of a widely-used textbook providing the first step into general relativity for undergraduate students with minimal mathematical background.

The present book is intended, as far as possible, to give an exact insight into the theory of Relativity to those readers who, from a general scientific and philosophical point of view, are interested in the theory, but who are not conversant with the mathematical apparatus of theoretical physics. The author

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has spared himself no pains in his endeavour to present the main ideas in the simplest and most intelligible form, and on the whole, in the sequence and connection in which they actually originated.

The noted expert selects 70 of his favorite "short" puzzles, including such mind-bogglers as The Returning Explorer, The Mutilated Chessboard, Scrambled Box Tops, and dozens more involving logic and basic math. Solutions included.

"The theory of black holes is the most simple consequence of Einstein's relativity theory. Dealing with relativity theory, this book details one of the most beautiful areas of mathematical physics; the theory of black holes. It represents a personal testament to the work of the author, who spent several years working-out the subject matter."--WorldCat.

An astrophysicist offers an entertaining introduction to Einstein's theories, explaining how well they have held up to rigorous testing over the years, and even describing the amazing phenomena readers would actually experience if they took a trip through a black hole.

Playing with mathematical riddles can be an intriguing and fun-filled pastime — as popular science writer Martin Gardner proves in this entertaining collection. Puzzlists need only an elementary knowledge of math and a will to resist looking up the answer before trying to solve a problem. Written in a light and witty style, Entertaining Mathematical Puzzles is a mixture of old and new riddles, grouped into sections that cover a variety of mathematical topics: money, speed, plane and solid geometry, probability, topology, tricky puzzles, and more. The probability section, for example, points out that everything we do, everything that happens around us, obeys the laws of probability; geometry puzzles test our ability to think pictorially and often, in more than one dimension; while topology, among the "youngest and rowdiest branches of modern geometry," offers a glimpse into a strange dimension

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where properties remain unchanged, no matter how a figure is twisted, stretched, or compressed. Clear and concise comments at the beginning of each section explain the nature and importance of the math needed to solve each puzzle. A carefully explained solution follows each problem. In many cases, all that is needed to solve a puzzle is the ability to think logically and clearly, to be "on the alert for surprising, off-beat angles...that strange hidden factor that everyone else had overlooked." Fully illustrated, this engaging collection will appeal to parents and children, amateur mathematicians, scientists, and students alike, and may, as the author writes, make the reader "want to study the subject in earnest" and explains "some of the inviting paths that wind away from the problems into lusher areas of the mathematical jungle." 65 black-and-white illustrations.

How would a creature limited to two dimensions be able to grasp the possibility of a third? In *Flatland*, A Square's linear world is invaded by a Sphere bringing the gospel of the third dimension. Part geometry lesson, part social satire, the novel enlarges readers' imaginations beyond the limits of our 'respective dimensional prejudices'.

Perfect for those interested in physics but who are not physicists or mathematicians, this book makes relativity so simple that a child can understand it. By replacing equations with diagrams, the book allows non-specialist readers to fully understand the concepts in relativity without the slow, painful progress so often associated with a complicated scientific subject. It allows readers not only to know how relativity works, but also to intuitively

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understand it.

By the year 1900, most of physics seemed to be encompassed in the two great theories of Newtonian mechanics and Maxwell's theory of electromagnetism. Unfortunately, there were inconsistencies between the two theories that seemed irreconcilable. Although many physicists struggled with the problem, it took the genius of Einstein to see that the inconsistencies were concerned not merely with mechanics and electromagnetism, but with our most elementary ideas of space and time. In the special theory of relativity, Einstein resolved these difficulties and profoundly altered our conception of the physical universe. Readers looking for a concise, well-written explanation of one of the most important theories in modern physics need search no further than this lucid undergraduate-level text. Replete with examples that make it especially suitable for self-study, the book assumes only a knowledge of algebra. Topics include classical relativity and the relativity postulate, time dilation, the twin paradox, momentum and energy, particles of zero mass, electric and magnetic fields and forces, and more. Writing a new book on the classic subject of Special Relativity, on which numerous important physicists have contributed and many books have already been written, can be like adding another epicycle to the Ptolemaic cosmology. Furthermore, it is our

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belief that if a book has no new elements, but simply repeats what is written in the existing literature, perhaps with a different style, then this is not enough to justify its publication. However, after having spent a number of years, both in class and research with relativity, I have come to the conclusion that there exists a place for a new book. Since it appears that somewhere along the way, mathematics may have obscured and prevailed to the degree that we tend to teach relativity (and I believe, theoretical physics) simply using “heavier” mathematics without the inspiration and the mastery of the classic physicists of the last century. Moreover current trends encourage the application of techniques in producing quick results and not tedious conceptual approaches resulting in long-lasting reasoning. On the other hand, physics cannot be done a la carte stripped from philosophy, or, to put it in a simple but dramatic context A building is not an accumulation of stones! As a result of the above, a major aim in the writing of this book has been the distinction between the mathematics of Minkowski space and the physics of relativity.

Here a physicist and a professor of literature guide general readers through the ideas that revolutionized our conception of the physical universe.

A quirky, funny, and accessible blend of science and art that delves into the heart of Einstein's theory of relativity It was a link to his 1905 paper--an early

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attempt at explaining his revolutionary ideas on space, time, and matter--that drew Tanya Bub into Albert Einstein's imaginative vision of the world. What particularly struck her was how Einstein interwove words and math to create clear visuals illustrating his theories. As an artist, she naturally started doodling as she worked her way through his concepts, creating drawings that intuitively demonstrated Einstein's core principles. In *Reimagining Time* Tanya Bub teams up with her father, the distinguished physicist Jeffrey Bub, to create a quirky and accessible take on one of science's most revolutionary discoveries. Blending original art and text, they guide readers through Einstein's theory of special relativity to expose truths about our universe: time is relative, lengths get shorter with motion, energy and mass are interchangeable, and the Universe has a speed limit. Since his first appearance over sixty years ago, Mr Tompkins has become known and loved by many thousands of readers as the bank clerk whose fantastic dreams and adventures lead him into a world inside the atom. George Gamow's classic provides a delightful explanation of the central concepts in modern physics, from atomic structure to relativity, and quantum theory to fusion and fission. Roger Penrose's foreword introduces Mr Tompkins to a new generation of readers and reviews his adventures in light of recent developments in

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physics.

Collaboration on the First Edition of Spacetime Physics began in the mid-1960s when Edwin Taylor took a junior faculty sabbatical at Princeton University where John Wheeler was a professor. The resulting text emphasized the unity of spacetime and those quantities (such as proper time, proper distance, mass) that are invariant, the same for all observers, rather than those quantities (such as space and time separations) that are relative, different for different observers. The book has become a standard introduction to relativity. The Second Edition of Spacetime Physics embodies what the authors have learned during an additional quarter century of teaching and research. They have updated the text to reflect the immense strides in physics during the same period and modernized and increased the number of exercises, for which the First Edition was famous. Enrichment boxes provide expanded coverage of intriguing topics. An enlarged final chapter on general relativity includes new material on gravity waves, black holes, and cosmology. The Second Edition of Spacetime Physics provides a new generation of readers with a deep and simple overview of the principles of relativity.

Provides a tour of the potential universes that could exist as a part of Einstein's theory of general relativity and introduces the physicists and mathematicians whose latest discoveries

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and ideas about physics and astronomy promote the concept of the “multiverse.” 12,000 first printing.

One of the subject's clearest, most entertaining introductions offers lucid explanations of special and general theories of relativity, gravity, and spacetime, models of the universe, and more. 100 illustrations.

An ideal choice for undergraduate students of science and engineering, this book presents a thorough exploration of the basic concepts of relativity. The treatment provides more than the typical coverage of introductory texts, and it offers maximum flexibility since many sections may be used independently, in altered order, or omitted altogether.

Numerous problems — most with hints and answers — make this volume ideal for supplementary reading and self-study.

Nearly 300 diagrams illuminate the three-part treatment, which examines special relativity in terms of kinematics and introductory dynamics as well as general relativity. Specific topics include the speed of light, the relative character of simultaneity, the Lorentz transformation, the conservation of momentum and energy, nuclei and fundamental particles, the principle of equivalence and curved space-time, Einstein's equations, and many other topics.

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An extraordinary and challenging synthesis of ideas uniting Quantum Theory, and the theories of Computation, Knowledge and Evolution, Deutsch's extraordinary book explores the deep connections between these strands which reveal the fabric of reality in which human actions and ideas play essential roles.

Clear, concise exposition of both the special and general theories of relativity, intended for nonscientific readers with a knowledge of high school math. Topics include simultaneity, time dilation, length contraction, the possibility of travel to a distant star, non-Euclidean geometries, black holes, and the

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structure of the universe. 158 illustrations.

Cipher and decipher codes: transposition and polyalphabetical ciphers, famous codes, typewriter and telephone codes, codes that use playing cards, knots, and swizzle sticks . . . even invisible writing and sending messages through space. 45 diagrams.

Concise treatment, based on ideas of Einstein and Minkowski, geared toward advanced undergraduates and graduate students of physics. Topics include old physics, new geometry, special relativity, curved space, and general relativity. 1950 edition.

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