

Serway 7th Solutions Valtar

Presents an illustrated guide to the universe and to Earth's relationship to it, moving from theories of creation to humankind's discovery of the cosmos, to general relativity, to space missions, and beyond.

This problem book is ideal for high-school and college students in search of practice problems with detailed solutions. All of the standard introductory topics in mechanics are covered: kinematics, Newton's laws, energy, momentum, angular momentum, oscillations, gravity, and fictitious forces. The introduction to each chapter provides an overview of the relevant concepts. Students can then warm up with a series of multiple-choice questions before diving into the free-response problems which constitute the bulk of the book. The first few problems in each chapter are derivations of key results/theorems that are useful when solving other problems. While the book is calculus-based, it can also easily be used in algebra-based courses. The problems that require calculus (only a sixth of the total number) are listed in an appendix, allowing students to steer clear of those if they wish. Additional details: (1) Features 150 multiple-choice questions and nearly 250 free-response problems, all with detailed solutions. (2) Includes 350 figures to help students visualize important concepts. (3) Builds on solutions by frequently including extensions/variations and additional remarks. (4) Begins with a chapter devoted to problem-solving strategies in physics. (5) A valuable supplement to the assigned textbook in any introductory mechanics course.

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A classic textbook on the principles of Newtonian mechanics for undergraduate students, accompanied by numerous worked examples and problems.

Accountants finally have a book that focuses on research completed in the field. This resource shows them the basics of performing research in advanced financial, tax, auditing, and fraud. They'll gain a better understanding of the basics of research tools so they'll be able to select the right one. Information is presented on IFRS and the Codification, including step-by-step details and screenshots. With this information, accountants will have the tools to succeed in the field.

One of the most famous science books of our time, the phenomenal national bestseller that "buzzes with energy, anecdote and life. It almost makes you want to become a physicist" (Science Digest). Richard P. Feynman, winner of the Nobel Prize in physics, thrived on outrageous adventures. In this lively work that "can shatter the stereotype of the stuffy scientist" (Detroit Free Press), Feynman recounts his experiences trading ideas on atomic physics with Einstein and cracking the uncrackable safes guarding the most deeply held nuclear secrets—and much more of an eyebrow-raising nature. In his stories, Feynman's life shines through in all its eccentric glory—a combustible mixture of high intelligence, unlimited curiosity, and raging chutzpah. Included for this edition is a new introduction by Bill Gates.

One of TIME's Ten Best Nonfiction Books of the Decade "Meet the new Stephen Hawking . . . The Order of Time is a dazzling book." --The Sunday Times From the

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bestselling author of *Seven Brief Lessons on Physics*, *Reality Is Not What It Seems*, and *Helgoland*, comes a concise, elegant exploration of time. Why do we remember the past and not the future? What does it mean for time to "flow"? Do we exist in time or does time exist in us? In lyric, accessible prose, Carlo Rovelli invites us to consider questions about the nature of time that continue to puzzle physicists and philosophers alike. For most readers this is unfamiliar terrain. We all experience time, but the more scientists learn about it, the more mysterious it remains. We think of it as uniform and universal, moving steadily from past to future, measured by clocks. Rovelli tears down these assumptions one by one, revealing a strange universe where at the most fundamental level time disappears. He explains how the theory of quantum gravity attempts to understand and give meaning to the resulting extreme landscape of this timeless world. Weaving together ideas from philosophy, science and literature, he suggests that our perception of the flow of time depends on our perspective, better understood starting from the structure of our brain and emotions than from the physical universe. Already a bestseller in Italy, and written with the poetic vitality that made *Seven Brief Lessons on Physics* so appealing, *The Order of Time* offers a profoundly intelligent, culturally rich, novel appreciation of the mysteries of time.

A half century ago, a shocking *Washington Post* headline claimed that the world began in five cataclysmic minutes rather than having existed for all time; a skeptical scientist dubbed the maverick theory the Big Bang. In

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this amazingly comprehensible history of the universe, Simon Singh decodes the mystery behind the Big Bang theory, lading us through the development of one of the most extraordinary, important, and awe-inspiring theories in science.

All existing introductory reviews of mineralogy are written accord ing to the same algorithm, sometimes called the "Dana System of Mineralogy". Even modern advanced handbooks, which are cer tainly necessary, include basic data on minerals and are essentially descriptive. When basic information on the chemistry, structure, optical and physical properties, distinguished features and para genesis of 200-400 minerals is presented, then there is practically no further space available to include new ideas and concepts based on recent mineral studies. A possible solution to this dilemma would be to present a book beginning where introductory textbooks end for those already famil iar with the elementary concepts. Such a volume would be tailored to specialists in all fields of science and industry, interested in the most recent results in mineralogy. This approach may be called Advanced Mineralogy. Here, an attempt has been made to survey the current possibilities and aims in mineral matter investigations, including the main characteristics of all the methods, the most important problems and topics of mineral ogy, and related studies. The individual volumes are composed of short, condensed chap ters. Each chapter presents in a complete, albeit condensed, form specific problems, methods, theories, and directions of investigations, and estimates their importance and strategic position in

science and industry.

This book will strengthen a student's grasp of the laws of physics by applying them to practical situations, and problems that yield more easily to intuitive insight than brute-force methods and complex mathematics. These intriguing problems, chosen almost exclusively from classical (non-quantum) physics, are posed in accessible non-technical language requiring the student to select the right framework in which to analyse the situation and decide which branches of physics are involved. The level of sophistication needed to tackle most of the two hundred problems is that of the exceptional school student, the good undergraduate, or competent graduate student. The book will be valuable to undergraduates preparing for 'general physics' papers. It is hoped that even some physics professors will find the more difficult questions challenging. By contrast, mathematical demands are minimal, and do not go beyond elementary calculus. This intriguing book of physics problems should prove instructive, challenging and fun.

Twenty-five years after its initial publication, *The Making of the Atomic Bomb* remains the definitive history of nuclear weapons and the Manhattan Project. From the turn-of-the-century discovery of nuclear energy to the dropping of the first bombs on Japan, Richard Rhodes's Pulitzer Prize-winning book details the science, the people, and the socio-

political realities that led to the development of the atomic bomb. This sweeping account begins in the 19th century, with the discovery of nuclear fission, and continues to World War Two and the Americans' race to beat Hitler's Nazis. That competition launched the Manhattan Project and the nearly overnight construction of a vast military-industrial complex that culminated in the fateful dropping of the first bombs on Hiroshima and Nagasaki. Reading like a character-driven suspense novel, the book introduces the players in this saga of physics, politics, and human psychology—from FDR and Einstein to the visionary scientists who pioneered quantum theory and the application of thermonuclear fission, including Planck, Szilard, Bohr, Oppenheimer, Fermi, Teller, Meitner, von Neumann, and Lawrence. From nuclear power's earliest foreshadowing in the work of H.G. Wells to the bright glare of Trinity at Alamogordo and the arms race of the Cold War, this dread invention forever changed the course of human history, and *The Making of The Atomic Bomb* provides a panoramic backdrop for that story. Richard Rhodes's ability to craft compelling biographical portraits is matched only by his rigorous scholarship. Told in rich human, political, and scientific detail that any reader can follow, *The Making of the Atomic Bomb* is a thought-provoking and masterful work. Introduces the superstring theory that attempts to

unite general relativity and quantum mechanics
Top ten Sunday Times Bestseller 'Engaging,
ambitious and creative' Guardian Where are we?
Are we alone? Who are we? Why are we here?
What is our future?

New edition of a classic textbook, introducing students to electricity and magnetism, featuring SI units and additional examples and problems. From the foundations of Newtonian physics to atomic and nuclear theories, this clearly explained text is a perfect guide for anyone who wants to be knowledgeable about standard college physics topics or needs a refresher. As it navigates through the material, it provides readers with the information necessary to define and understand physics concepts. Readers will also develop the ability to comprehend basic physical laws that govern our universe, as well as skills to apply the theoretical knowledge to solving conceptual and quantitative problems. This book was designed for those who want to develop a better understanding of our physical universe, as well as the relationships between different laws of physics. The content is focused on an essential review of all major physics theories, principles, and experimental approaches. You will learn about kinematics and dynamics, statics and equilibrium, foundations of gravity, energy, work, sound and light, electricity and magnetism, basic principles of atomic physics, as

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well as heat and thermodynamics. The book also describes all major topics covered in a standard college physics course and walks you through solving different types of problems. Created by highly qualified physics instructors with years of experience in applied physics, as well as in academic settings, this book educates and empowers readers, regardless of whether they took college physics or not, helping them develop and increase their understanding of how our universe works.

One of Smithsonian's Favorite Books of 2018 One of Forbes's 2018 Best Books About Astronomy, Physics and Mathematics One of Kirkus's Best Books of 2018 The intellectual adventure story of the "double-slit" experiment, showing how a sunbeam split into two paths first challenged our understanding of light and then the nature of reality itself--and continues to almost 200 years later. Many of science's greatest minds have grappled with the simple yet elusive "double-slit" experiment. Thomas Young devised it in the early 1800s to show that light behaves like a wave, and in doing so opposed Isaac Newton. Nearly a century later, Albert Einstein showed that light comes in quanta, or particles, and the experiment became key to a fierce debate between Einstein and Niels Bohr over the nature of reality. Richard Feynman held that the double slit embodies the central mystery of the quantum world.

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Decade after decade, hypothesis after hypothesis, scientists have returned to this ingenious experiment to help them answer deeper and deeper questions about the fabric of the universe. How can a single particle behave both like a particle and a wave? Does a particle exist before we look at it, or does the very act of looking create reality? Are there hidden aspects to reality missing from the orthodox view of quantum physics? Is there a place where the quantum world ends and the familiar classical world of our daily lives begins, and if so, can we find it? And if there's no such place, then does the universe split into two each time a particle goes through the double slit? With his extraordinarily gifted eloquence, Anil Ananthaswamy travels around the world and through history, down to the smallest scales of physical reality we have yet fathomed. *Through Two Doors at Once* is the most fantastic voyage you can take.

A basic introductory physics Self-Teaching Guide for liberal arts physics to compete with and compliment Hewitt, but with more end of chapter problems. Could be used as a programmed guide to a one-semester physics course or as a supplement to a full-year. Also for self-study.

Explore the laws and theories of physics in this accessible introduction to the forces that shape our universe, our planet, and our everyday lives. Using a bold, graphics-led approach, *The Physics Book* sets

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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.

INSTANT NEW YORK TIMES BESTSELLER A Science News favorite science book of 2019 As you read these words, copies of you are being created. Sean Carroll, theoretical physicist and one of this world's most celebrated writers on science, rewrites the history of 20th century physics. Already hailed as a masterpiece, *Something Deeply Hidden* shows for the first time that facing up to the essential puzzle of quantum mechanics utterly transforms how we think about space and time. His reconciling of quantum mechanics with Einstein's theory of relativity changes, well, everything. Most physicists haven't even recognized the uncomfortable truth: physics has been in crisis since 1927. Quantum mechanics has always had obvious gaps—which have come to be simply ignored. Science popularizers keep telling us how weird it is, how impossible it is to understand. Academics discourage students from working on the "dead end" of quantum foundations. Putting his professional reputation on the line with this audacious yet entirely reasonable book, Carroll says that the crisis can now come to an end. We just have to accept that there is more than one of us in the universe. There are many, many Sean Carrolls. Many of every one of us. Copies of you are generated thousands of times per second. The Many Worlds Theory of quantum behavior says that every time there is a quantum event, a world splits off with

everything in it the same, except in that other world the quantum event didn't happen. Step-by-step in Carroll's uniquely lucid way, he tackles the major objections to this otherworldly revelation until his case is inescapably established. Rarely does a book so fully reorganize how we think about our place in the universe. We are on the threshold of a new understanding—of where we are in the cosmos, and what we are made of.

A bold and all-embracing exploration of the nature and progress of knowledge from one of today's great thinkers. Throughout history, mankind has struggled to understand life's mysteries, from the mundane to the seemingly miraculous. In this important new book, David Deutsch, an award-winning pioneer in the field of quantum computation, argues that explanations have a fundamental place in the universe. They have unlimited scope and power to cause change, and the quest to improve them is the basic regulating principle not only of science but of all successful human endeavor. This stream of ever improving explanations has infinite reach, according to Deutsch: we are subject only to the laws of physics, and they impose no upper boundary to what we can eventually understand, control, and achieve. In his previous book, *The Fabric of Reality*, Deutsch describe the four deepest strands of existing knowledge—the theories of evolution, quantum physics, knowledge, and computation—arguing jointly

they reveal a unified fabric of reality. In this new book, he applies that worldview to a wide range of issues and unsolved problems, from creativity and free will to the origin and future of the human species. Filled with startling new conclusions about human choice, optimism, scientific explanation, and the evolution of culture, *The Beginning of Infinity* is a groundbreaking book that will become a classic of its kind.

The author explores recent scientific breakthroughs in the fields of supergravity, supersymmetry, quantum theory, superstring theory, and p-branes as he searches for the Theory of Everything that lies at the heart of the cosmos.

The Nobel Prize-winning physicist describes the quest for a unifying theory of nature--one that explains events such as the pull of gravity and the cohesion inside of an atom. By the author of *The First Three Minutes*. Reprint. 25,000 first printing. "Physics" 2nd edition is an alternate version of the "College Physics" 3rd edition text by Giambattista/Richardson/Richardson. The key difference is that "Physics" covers kinematics and forces in the more traditional organization of beginning with Kinematics and proceeding to forces. ("College Physics" takes an integrated approach to forces and kinematics, introducing forces and interweaving kinematics.).

Examines the effort to discover the Higgs boson

particle by tracing the development and use of the Large Hadron Collider and how its findings are dramatically shaping scientific understandings while enabling world-changing innovations.

Organic chemistry is not merely a compilation of principles, but rather, it is a disciplined method of thought and analysis. Success in organic chemistry requires mastery in two core aspects: fundamental concepts and the skills needed to apply those concepts and solve problems. Readers must learn to become proficient at approaching new situations methodically, based on a repertoire of skills. These skills are vital for successful problem solving in organic chemistry. Existing textbooks provide extensive coverage of, the principles, but there is far less emphasis on the skills needed to actually solve problems.

The third edition of this highly acclaimed undergraduate textbook is suitable for teaching all the mathematics for an undergraduate course in any of the physical sciences. As well as lucid descriptions of all the topics and many worked examples, it contains over 800 exercises. New stand-alone chapters give a systematic account of the 'special functions' of physical science, cover an extended range of practical applications of complex variables, and give an introduction to quantum operators. Further tabulations, of relevance in statistics and numerical integration, have been added. In this edition, half of the exercises are provided with hints and answers and, in a separate manual available to both students and their

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teachers, complete worked solutions. The remaining exercises have no hints, answers or worked solutions and can be used for unaided homework; full solutions are available to instructors on a password-protected web site, www.cambridge.org/9780521679718.

“The man who makes physics sexy . . . the scientist they’re calling the next Stephen Hawking.” —The Times Magazine From the New York Times—bestselling author of *Seven Brief Lessons on Physics*, *The Order of Time*, and *Helgoland*, a closer look at the mind-bending nature of the universe. What are the elementary ingredients of the world? Do time and space exist? And what exactly is reality? Theoretical physicist Carlo Rovelli has spent his life exploring these questions. He tells us how our understanding of reality has changed over the centuries and how physicists think about the structure of the universe today. In elegant and accessible prose, Rovelli takes us on a wondrous journey from Democritus to Albert Einstein, from Michael Faraday to gravitational waves, and from classical physics to his own work in quantum gravity. As he shows us how the idea of reality has evolved over time, Rovelli offers deeper explanations of the theories he introduced so concisely in *Seven Brief Lessons on Physics*. This book culminates in a lucid overview of quantum gravity, the field of research that explores the quantum nature of space and time, seeking to unify quantum mechanics and general relativity. Rovelli invites us to imagine a marvelous world where space breaks up into tiny grains, time disappears at the smallest scales, and black holes are waiting to explode—a vast universe still largely undiscovered.

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This reference book is the third in a series of five volumes presenting a concise treatise on problems and final results of modern studies of earth and planetary materials in their most sophisticated aspects. It is encyclopedic in its coverage of subjects, which include the systematic description of all areas of mineral matter studies corresponding to the actual capabilities and needs of science and industry. This third volume, with contributions from 200 top specialists from all over the world, contains chapters on Mineral Matter in Space, Mineralogy of the Mantle and Core, Mineralogy of the Ocean Floor, Biomineralization, Environmental Mineralogy, Radiation Mineralogy, and Gemology and Jewelry.

'This is about gob-smacking science at the far end of reason ... Take it nice and easy and savour the experience of your mind being blown without recourse to hallucinogens' Nicholas Lezard, *Guardian* For most people, quantum theory is a byword for mysterious, impenetrable science. And yet for many years it was equally baffling for scientists themselves. In this magisterial book, Manjit Kumar gives a dramatic and superbly-written history of this fundamental scientific revolution, and the divisive debate at its core. Quantum theory looks at the very building blocks of our world, the particles and processes without which it could not exist. Yet for 60 years most physicists believed that quantum theory denied the very existence of reality itself. In this tour de force of science history, Manjit Kumar shows how the golden age of physics ignited the greatest intellectual debate of the twentieth century. Quantum theory is

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weird. In 1905, Albert Einstein suggested that light was a particle, not a wave, defying a century of experiments. Werner Heisenberg's uncertainty principle and Erwin Schrodinger's famous dead-and-alive cat are similarly strange. As Niels Bohr said, if you weren't shocked by quantum theory, you didn't really understand it. While "Quantum" sets the science in the context of the great upheavals of the modern age, Kumar's centrepiece is the conflict between Einstein and Bohr over the nature of reality and the soul of science. 'Bohr brainwashed a whole generation of physicists into believing that the problem had been solved', lamented the Nobel Prize-winning physicist Murray Gell-Mann. But in "Quantum", Kumar brings Einstein back to the centre of the quantum debate. "Quantum" is the essential read for anyone fascinated by this complex and thrilling story and by the band of brilliant men at its heart.

The New York Times bestseller from the author of *The Order of Time and Reality Is Not What It Seems* and *Helgoland* "One of the year's most entrancing books about science."—*The Wall Street Journal* "Clear, elegant...a whirlwind tour of some of the biggest ideas in physics."—*The New York Times Book Review* This playful, entertaining, and mind-bending introduction to modern physics briskly explains Einstein's general relativity, quantum mechanics, elementary particles, gravity, black holes, the complex architecture of the universe, and the role humans play in this weird and wonderful world. Carlo Rovelli, a renowned theoretical physicist, is a delightfully poetic and philosophical scientific guide. He takes us to the frontiers of our

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knowledge: to the most minute reaches of the fabric of space, back to the origins of the cosmos, and into the workings of our minds. The book celebrates the joy of discovery. "Here, on the edge of what we know, in contact with the ocean of the unknown, shines the mystery and the beauty of the world," Rovelli writes. "And it's breathtaking."

This textbook covers all the standard introductory topics in classical mechanics, including Newton's laws, oscillations, energy, momentum, angular momentum, planetary motion, and special relativity. It also explores more advanced topics, such as normal modes, the Lagrangian method, gyroscopic motion, fictitious forces, 4-vectors, and general relativity. It contains more than 250 problems with detailed solutions so students can easily check their understanding of the topic. There are also over 350 unworked exercises which are ideal for homework assignments. Password protected solutions are available to instructors at www.cambridge.org/9780521876223. The vast number of problems alone makes it an ideal supplementary text for all levels of undergraduate physics courses in classical mechanics. Remarks are scattered throughout the text, discussing issues that are often glossed over in other textbooks, and it is thoroughly illustrated with more than 600 figures to help demonstrate key concepts. Examines such phenomena as black holes, wormholes, singularities, gravitational waves, and time machines, exploring the fundamental principles that control the universe.

Stephen Hawking was recognized as one of the greatest

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minds of our time and a figure of inspiration after defying his ALS diagnosis at age twenty-one. He is known for both his breakthroughs in theoretical physics as well as his ability to make complex concepts accessible for all, and was beloved for his mischievous sense of humor. At the time of his death, Hawking was working on a final project: a book compiling his answers to the "big" questions that he was so often posed--questions that ranged beyond his academic field. Within these pages, he provides his personal views on our biggest challenges as a human race, and where we, as a planet, are heading next. Each section will be introduced by a leading thinker offering his or her own insight into Professor Hawking's contribution to our understanding. The book will also feature a foreword from Academy Award winning actor Eddie Redmayne, who portrayed Hawking in the film *The Theory of Everything*, and an afterword by Hawking's daughter, Lucy Hawking, as well as personal photographs and additional archival material.

A Wall Street Journal Best Book of 2013 If you ever regretted not taking physics in college--or simply want to know how to think like a physicist--this is the book for you. In this bestselling introduction, physicist Leonard Susskind and hacker-scientist George Hrabovsky offer a first course in physics and associated math for the ardent amateur. Challenging, lucid, and concise, *The Theoretical Minimum* provides a tool kit for amateur scientists to learn physics at their own pace.

Sheds new light on discoveries that have revolutionized the field of cosmology and transformed understanding of the universe, offering an explanation of the multiverse M-theory

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and its implications in terms of the fate of our own universe.

****WINNER OF THE 2020 NOBEL PRIZE IN PHYSICS**** The

Road to Reality is the most important and ambitious work of science for a generation. It provides nothing less than a comprehensive account of the physical universe and the essentials of its underlying mathematical theory. It assumes no particular specialist knowledge on the part of the reader, so that, for example, the early chapters give us the vital mathematical background to the physical theories explored later in the book. Roger Penrose's purpose is to describe as clearly as possible our present understanding of the universe and to convey a feeling for its deep beauty and philosophical implications, as well as its intricate logical interconnections.

The Road to Reality is rarely less than challenging, but the book is leavened by vivid descriptive passages, as well as hundreds of hand-drawn diagrams. In a single work of colossal scope one of the world's greatest scientists has given us a complete and unrivalled guide to the glories of the universe that we all inhabit. 'Roger Penrose is the most important physicist to work in relativity theory except for Einstein. He is one of the very few people I've met in my life who, without reservation, I call a genius' Lee Smolin

This collection from scientist and Nobel Peace Prize winner highlights the achievements of a man whose career reshaped the world's understanding of quantum electrodynamics. The Pleasure of Finding Things Out is a magnificent treasury of the best short works of Richard P. Feynman—from interviews and speeches to lectures and printed articles. A sweeping, wide-ranging collection, it presents an intimate and fascinating view of a life in science—a life like no other. From his ruminations on science in our culture to his Nobel Prize acceptance speech, this book will fascinate anyone interested in the world of ideas.

A shorter, more accessible edition of a now-classic survey of

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the origin and nature of the universe features new full-color illustrations and an expanded, easier to understand treatment of the volume's more important theoretical concepts.

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