

Cosmology A Very Short Introduction Peter Coles

PlatoExam Prep Flash Cards for Cosmology: A Very Short IntroductionAstrophysics: A Very Short IntroductionPlanets: A Very Short IntroductionIntroduction To The Theory Of The Early Universe: Cosmological Perturbations And Inflationary TheoryThe History of PhysicsThe History of Time: A Very Short IntroductionScience and Religion: A Very Short IntroductionStars: A Very Short IntroductionMoons: A Very Short IntroductionAestheticsThe Scientific Revolution: A Very Short IntroductionPlanetsParticle Physics: A Very Short IntroductionPhysical Foundations of CosmologyCosmology: A Very Short IntroductionCosmologyNuclear Physics: A Very Short IntroductionCosmology: A Very Short IntroductionIntroduction to CosmologyRelativity: A Very Short IntroductionAn Introduction to Modern CosmologyInfinity: A Very Short IntroductionGravityCosmology: a Very Short IntroductionChemistry: A Very Short IntroductionThe Little Book of CosmologyAstrobiology: A Very Short IntroductionPhysics: A Very Short IntroductionCosmologyThe History of Astronomy: A Very Short IntroductionMormonism: A Very Short IntroductionAfrican ReligionsNothing: A Very Short IntroductionStructural Engineering: A Very Short IntroductionThe Sun: A Very Short IntroductionCopernicus: a Very Short IntroductionBlack Holes: A Very Short IntroductionQuantum Theory: A Very Short

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IntroductionGalaxies: A Very Short Introduction

Plato

Lawrence M. Principe takes a fresh approach to the story of the scientific revolution, emphasising the historical context of the society and its world view at the time. From astronomy to alchemy and medicine to geology, he tells this fascinating story from the perspective of the historical characters involved.

Exam Prep Flash Cards for Cosmology: A Very Short Introduction

Examines the origins of life on Earth and the search for extraterrestrial life, through an understanding of the factors that have allowed life to exist on this planet and the commonalities on others that may enable life elsewhere.

Astrophysics: A Very Short Introduction

This is a uniquely comprehensive and detailed treatment of the theoretical and observational foundations of modern cosmology, by a Nobel Laureate in Physics. It gives up-to-date and self contained accounts of the theories and observations that have made the past few decades a golden age of cosmology.

Planets: A Very Short Introduction

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In this compelling introduction to the fundamental particles that make up the universe, Frank Close takes us on a journey into the atom to examine known particles such as quarks, electrons, and the ghostly neutrino. Along the way he provides fascinating insights into how discoveries in particle physics have actually been made, and discusses how our picture of the world has been radically revised in the light of these developments. He concludes by looking ahead to new ideas about the mystery of antimatter, the number of dimensions that there might be in the universe, and to what the next 50 years of research might reveal. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Introduction To The Theory Of The Early Universe: Cosmological Perturbations And Inflationary Theory

The debate between science and religion is never out of the news: emotions run high, fuelled by polemical bestsellers like *The God Delusion* and, at the other end of the spectrum, high-profile campaigns to teach 'Intelligent Design' in schools. Yet there is much more to the debate than the clash of these extremes. As Thomas Dixon shows in this balanced and thought-provoking introduction, a whole range of views, subtle

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arguments, and fascinating perspectives can be taken on this complex and centuries-old subject. He explores not only the key philosophical questions that underlie the debate, but also highlights the social, political, and ethical contexts that have made 'science and religion' such a fraught and interesting topic in the modern world. Along the way, he examines landmark historical episodes such as the Galileo affair, Charles Darwin's own religious and scientific odyssey, the Scopes 'Monkey Trial' in Tennessee in 1925, and the Dover Area School Board case of 2005, and includes perspectives from non-Christian religions and examples from across the physical, biological, and social sciences.

The History of Physics

This book is a simple, non-technical introduction to cosmology, explaining what it is and what cosmologists do. Peter Coles discusses the history of the subject, the development of the Big Bang theory, and more speculative modern issues like quantum cosmology, superstrings, and dark matter.

The History of Time: A Very Short Introduction

Black holes are a constant source of fascination to many due to their mysterious nature. In this Very Short Introduction, Katherine Blundell addresses a variety of questions, including what a black hole actually is, how they are characterized and discovered, and what would happen if you came too

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close to one. She explains how black holes form and grow - by stealing material that belongs to stars, as well as how many there may be in the Universe. She also explores the large black holes found in the centres of galaxies, and how black holes give rise to quasars and other spectacular phenomena in the cosmos. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Science and Religion: A Very Short Introduction

Stars: A Very Short Introduction

Astronomy, perhaps the first of the sciences, was already well developed by the time of Christ. Seventeen centuries later, after Newton showed that the movements of the planets could be explained in terms of gravitation, it became the paradigm for the mathematical sciences. In the nineteenth century the analysis of star-light allowed astrophysicists to determine both the chemical composition and the radial velocities of celestial bodies, while the development of photography enabled distant objects invisible to the human eye, to be studied and measured in comfort. Technical developments during

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and since the Second World War have greatly enlarged the scope of the science by permitting the study of radiation. This is a fascinating introduction to the history of Western astronomy, from prehistoric times to the origins of astrophysics in the mid-nineteenth century. Historical records are first found in Babylon and Egypt, and after two millennia the arithmetical astronomy of the Babylonians merged with the Greek geometrical approach to culminate in the Almagest of Ptolemy. This legacy was transmitted to the Latin West via Islam, and led to Copernicus's claim that the Earth is in motion. In justifying this Kepler converted astronomy into a branch of dynamics, leading to Newton's universal law of gravity. The book concludes with eighteenth- and nineteenth-century applications of Newton's law, and the first explorations of the universe of stars. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Moons: A Very Short Introduction

An exploration of the concept of "nothing" journeys from ancient ideas and cultural traditions to the latest scientific research, discussing the history of the vacuum, theories on the nature of time and space, and other discoveries.

Aesthetics

What are African religions? *African Religions: A Very Short Introduction* answers this question by examining primarily indigenous religious traditions on the African continent. It focuses on the diversity of people, ethnic groups, languages, cultures, ethos, and worldviews, keeping in mind the continent's regional diversity. Using a multidisciplinary methodological approach, Olupona examines a wide range of African religious traditions on their own terms as well as in their pluralistic social, cultural, and political contexts. Cultural and postcolonial interpretive frameworks benefit the discussion. For example, the book moves beyond ethnographic descriptions and interpretations of core beliefs and practices to look at how African religion has engaged issues of socioeconomic development and power relations. Sources for this book include archaeological and historical references. Additionally, Olupona uses ethnographic materials based on fieldwork collected through interviews and participant observation, along with archival materials, including missionary records, which describe African religious practices. Though the emphasis is on native faith traditions, these are not static traditions. African religions have responded to changes within their local communities and to fluxes caused by outside influences. About the Series: Oxford's Very Short Introductions series offers concise and original introductions to a wide range of subjects - from Islam to Sociology, Politics to Classics, Literary Theory to History, and Archaeology to the Bible. Not simply a textbook of definitions, each volume in this series

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provides trenchant and provocative - yet always balanced and complete - discussions of the central issues in a given discipline or field. Every Very Short Introduction gives a readable evolution of the subject in question, demonstrating how the subject has developed and how it has influenced society. Eventually, the series will encompass every major academic discipline, offering all students an accessible and abundant reference library. Whatever the area of study that one deems important or appealing, whatever the topic that fascinates the general reader, the Very Short Introductions series has a handy and affordable guide that will likely prove indispensable.

The Scientific Revolution: A Very Short Introduction

Planets

Nicolaus Copernicus (1473-1543) is a pivotal figure in the birth of modern science, the astronomer who "stopped the sun and set the earth in motion." Born in Poland, educated at Cracow and then in Italy, he served all of his adult life as a church administrator. His vision of a sun-centered universe, shocking to many and unbelievable to most, turned out to be the essential blueprint for a physical understanding of celestial motions, thereby triggering what is commonly called "the Copernican revolution." A first edition of his world-changing treatise, *De Revolutionibus Orbium Coelestium*, has most recently

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been auctioned for more than \$2 million. In this book, leading historian of science Owen Gingerich sets Copernicus in the context of a rapidly changing world, where the recent invention of printing with moveable type not only made sources more readily available to him, but also fueled Martin's Luther's transformation of the religious landscape. In an era of geographical exploration and discovery, new ideas were replacing time-honored concepts about the extent of inhabited continents. Gingerich reveals Copernicus' heliocentric revolution as an aesthetic achievement not dictated by observational "proofs," but another new way of looking at the ancient cosmos. Deftly combining astronomy and history, this Very Short Introduction offers a fascinating portrayal of the man who launched the modern vision of the universe. Out of Gingerich's engaging biography emerges the image of a scientist, intellectual, patriot, and reformer, who lived in an era when political as well as religious beliefs were shifting.

Particle Physics: A Very Short Introduction

Aesthetics is a branch of philosophy that explores the nature of art, beauty, and taste. It doesn't just consider traditional artistic experiences such as artworks in a museum or an opera performance, but also everyday experiences such as autumn leaves in the park, or even just the light of the setting sun falling on the kitchen table. It is also about your experience when you choose the shirt you're going to wear today or when you wonder whether you should

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put more pepper in the soup. Aesthetics is everywhere. It is one of the most important aspects of our life. In this Very Short Introduction Bence Nanay introduces the field of aesthetics, considering both Western and non-Western aesthetic traditions, and exploring why it is sometimes misunderstood or considered to be too elitist - by artists, musicians, and even philosophers. As Nanay shows, so-called 'high art' has no more claims on aesthetics than sitcoms, tattoos, or punk rock. In fact, the scope of aesthetics extends far wider than that of art, high or low, including much of what we care about in life. It is not the job of aesthetics to tell you which artworks are good and which ones are bad. It is not the job of aesthetics to tell you what experiences are worth having. If an experience is worth having for you, it thereby becomes the subject of aesthetics. This realisation is important, because thinking about aesthetics in this inclusive way opens up new ways of understanding old questions about the social aspect of our aesthetic engagements, and the importance of aesthetic values for our own self. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Physical Foundations of Cosmology

"Julia Annas provides an incisive exploration of the

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many-sided and elusive genius whose wide-ranging, bold, and influential ideas continue to challenge, provoke, and inspire us today"--Page 4 of cover.

Cosmology: A Very Short Introduction

Nuclear physics began long before the identification of fundamental particles, with J. J. Thomson's discovery of the electron at the end of the 19th century, which implied the existence of a positive charge in the atom to make it neutral. In this Very Short Introduction Frank Close gives an account of how this area of physics has progressed, including the recognition of how heavy nuclei are built up in the cores of stars and in supernovae, the identification of quarks and gluons, and the development of quantum chromodynamics (QCD). Exploring key concepts such as the stability of different configurations of protons and neutrons in nuclei, Frank Close shows how nuclear physics brings the physics of the stars to Earth and provides us with important applications, particularly in medicine. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Cosmology

Every atom of our bodies has been part of a star. Our

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very own star, the Sun, is crucial to the development and sustainability of life on Earth. This Very Short Introduction presents a modern, authoritative examination of how stars live, producing all the chemical elements beyond helium, and how they die, sometimes spectacularly, to end as remnants such as black holes. Andrew King shows how understanding the stars is key to understanding the galaxies they inhabit, and thus the history of our entire Universe, as well as the existence of planets like our own. King presents a fascinating exploration of the science of stars, from the mechanisms that allow stars to form and the processes that allow them to shine, as well as the results of their inevitable death. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Nuclear Physics: A Very Short Introduction

This Very Short Introduction discusses the nature of planets and gas giants, and their rings and moons. It also looks beyond Pluto, in the Kuiper Belt, at the knowledge we have about planets around other stars. With many striking photos to illustrate the details, it demonstrates the unique world of every planet.

Cosmology: A Very Short Introduction

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Infinity is an intriguing topic, with connections to religion, philosophy, metaphysics, logic, and physics as well as mathematics. Its history goes back to ancient times, with especially important contributions from Euclid, Aristotle, Eudoxus, and Archimedes. The infinitely large (infinite) is intimately related to the infinitely small (infinitesimal). Cosmologists consider sweeping questions about whether space and time are infinite. Philosophers and mathematicians ranging from Zeno to Russell have posed numerous paradoxes about infinity and infinitesimals. Many vital areas of mathematics rest upon some version of infinity. The most obvious, and the first context in which major new techniques depended on formulating infinite processes, is calculus. But there are many others, for example Fourier analysis and fractals. In this Very Short Introduction, Ian Stewart discusses infinity in mathematics while also drawing in the various other aspects of infinity and explaining some of the major problems and insights arising from this concept. He argues that working with infinity is not just an abstract, intellectual exercise but that it is instead a concept with important practical everyday applications, and considers how mathematicians use infinity and infinitesimals to answer questions or supply techniques that do not appear to involve the infinite. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and

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challenging topics highly readable.

Introduction to Cosmology

An Introduction to Modern Cosmology Third Edition is an accessible account of modern cosmological ideas. The Big Bang Cosmology is explored, looking at its observational successes in explaining the expansion of the Universe, the existence and properties of the cosmic microwave background, and the origin of light elements in the universe. Properties of the very early Universe are also covered, including the motivation for a rapid period of expansion known as cosmological inflation. The third edition brings this established undergraduate textbook up-to-date with the rapidly evolving observational situation. This fully revised edition of a bestseller takes an approach which is grounded in physics with a logical flow of chapters leading the reader from basic ideas of the expansion described by the Friedman equations to some of the more advanced ideas about the early universe. It also incorporates up-to-date results from the Planck mission, which imaged the anisotropies of the Cosmic Microwave Background radiation over the whole sky. The Advanced Topic sections present subjects with more detailed mathematical approaches to give greater depth to discussions. Student problems with hints for solving them and numerical answers are embedded in the chapters to facilitate the reader's understanding and learning. Cosmology is now part of the core in many degree programs. This current, clear and concise introductory text is relevant to a wide range of astronomy programs worldwide and is

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essential reading for undergraduates and Masters students, as well as anyone starting research in cosmology. The accompanying website for this text, <http://booksupport.wiley.com>, provides additional material designed to enhance your learning, as well as errata within the text.

Relativity: A Very Short Introduction

How does the physics we know today - a highly professionalized enterprise, inextricably linked to government and industry - link back to its origins as a liberal art in Ancient Greece? What is the path that leads from the old philosophy of nature and its concern with humankind's place in the universe to modern massive international projects that hunt down fundamental particles and industrial laboratories that manufacture marvels? This Very Short Introduction introduces us to Islamic astronomers and mathematicians calculating the size of the earth while their caliphs conquered much of it; to medieval scholar-theologians investigating light; to Galileo, Copernicus, Kepler, and Newton, measuring, and trying to explain, the universe. We visit the "House of Wisdom" in 9th-century Baghdad; Europe's first universities; the courts of the Renaissance; the Scientific Revolution and the academies of the 18th century; and the increasingly specialized world of 20th and 21st century science. Highlighting the shifting relationship between physics, philosophy, mathematics, and technology - and the implications for humankind's self-understanding - Heilbron explores the changing place and purpose of physics in

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the cultures and societies that have nurtured it over the centuries. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

An Introduction to Modern Cosmology

Astrophysics is the physics of the stars, and more widely the physics of the Universe. It enables us to understand the structure and evolution of planetary systems, stars, galaxies, interstellar gas, and the cosmos as a whole. In this Very Short Introduction, the leading astrophysicist James Binney shows how the field of astrophysics has expanded rapidly in the past century, with vast quantities of data gathered by telescopes exploiting all parts of the electromagnetic spectrum, combined with the rapid advance of computing power, which has allowed increasingly effective mathematical modelling. He illustrates how the application of fundamental principles of physics - the consideration of energy and mass, and momentum - and the two pillars of relativity and quantum mechanics, has provided insights into phenomena ranging from rapidly spinning millisecond pulsars to the collision of giant spiral galaxies. This is a clear, rigorous introduction to astrophysics for those keen to cut their teeth on a conceptual treatment involving some mathematics. ABOUT THE SERIES: The

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Infinity: A Very Short Introduction

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Gravity

This is the 2nd edition of a highly successful title on this fascinating and complex subject. Concentrating primarily on the theory behind the origin and the evolution of the universe, and where appropriate relating it to observation, the new features of the this addition include: An overall introduction to the book
Two new chapters: Gravitational Lensing and Gravitational Waves Each part has a collection of exercises with solutions to numerical parts at the end of the book Contains a table of physical constants The addition of a consolidated bibliography

Cosmology: a Very Short Introduction

100 years ago, Einstein's theory of relativity shattered the world of physics. Our comforting Newtonian ideas of space and time were replaced by bizarre and counterintuitive conclusions: if you move at high speed, time slows down, space squashes up and you get heavier; travel fast enough and you could weigh as much as a jumbo jet, be squashed thinner than a CD without feeling a thing - and live for ever. And that was just the Special Theory. With the General Theory came even stranger ideas of curved space-time, and changed our understanding of gravity and the cosmos. This authoritative and entertaining Very Short Introduction makes the theory of relativity accessible and understandable. Using very little mathematics, Russell Stannard explains the important concepts of relativity, from $E=mc^2$ to black holes, and explores the theory's impact on science and on our understanding of the universe. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Chemistry: A Very Short Introduction

Quantum Theory is the most revolutionary discovery in physics since Newton. This book gives a lucid, exciting, and accessible account of the surprising and

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counterintuitive ideas that shape our understanding of the sub-atomic world. It does not disguise the problems of interpretation that still remain unsettled 75 years after the initial discoveries. The main text makes no use of equations, but there is a Mathematical Appendix for those desiring stronger fare. Uncertainty, probabilistic physics, complementarity, the problematic character of measurement, and decoherence are among the many topics discussed. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

The Little Book of Cosmology

Most people remember chemistry from their schooldays as largely incomprehensible, a subject that was fact-rich but understanding-poor, smelly, and so far removed from the real world of events and pleasures that there seemed little point, except for the most introverted, in coming to terms with its grubby concepts, spells, recipes, and rules. Peter Atkins wants to change all that. In this Very Short Introduction to Chemistry, he encourages us to look at chemistry anew, through a chemist's eyes, in order to understand its central concepts and to see how it contributes not only towards our material comfort, but also to human culture. Atkins shows how chemistry

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provides the infrastructure of our world, through the chemical industry, the fuels of heating, power generation, and transport, as well as the fabrics of our clothing and furnishings. By considering the remarkable achievements that chemistry has made, and examining its place between both physics and biology, Atkins presents a fascinating, clear, and rigorous exploration of the world of chemistry - its structure, core concepts, and exciting contributions to new cutting-edge technologies. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Astrobiology: A Very Short Introduction

This book is a simple, non-technical introduction to cosmology, explaining what it is and what cosmologists do. Peter Coles discusses the history of the subject, the development of the Big Bang theory, and more speculative modern issues like quantum cosmology, superstrings, and dark matter. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Physics: A Very Short Introduction

Beginning with a handful of members in 1830, the church that Joseph Smith founded has grown into a world-wide organization with over 12 million adherents, playing prominent roles in politics, sports, entertainment, and business. Yet they are an oddity. They are considered wholesome, conservative, and friendly on one hand, and clannish, weird, and self-righteous on the other. *Mormonism: A Very Short Introduction* explains who Mormons are: what they believe and how they live their lives. Written by Richard Lyman Bushman, an eminent historian and practicing Mormon, this compact, informative volume ranges from the history of the Church of Jesus Christ of Latter-day Saints to the contentious issues of contemporary Mormonism. Bushman argues that Joseph Smith still serves as the Mormons' Moses. Their everyday religious lives are still rooted in his conceptions of true Christianity. They seek revelation to solve life's problems just as he did. They believe the authority to seal families together for eternity was restored through him. They understand their lives as part of a spiritual journey that started in a "council in heaven" before the world began just as he taught. Bushman's account also describes the tensions and sorrows of Mormon life. How are Mormons to hold on to their children in a world of declining moral standards and rampant disbelief? How do rational, educated Mormons stand up to criticisms of their faith? How do single Mormons fare in a church that emphasizes family life? The book also examines polygamy, the various Mormon scriptures, and the

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renegade fundamentalists who tarnish the LDS image when in fact they're not members. In a time when Mormons such as Mitt Romney and Harry Reid are playing prominent roles in American society, this engaging introduction enables readers to judge for themselves how Mormon teachings shape the character of believers. About the Series: Oxford's Very Short Introductions series offers concise and original introductions to a wide range of subjects--from Islam to Sociology, Politics to Classics, Literary Theory to History, and Archaeology to the Bible. Not simply a textbook of definitions, each volume in this series provides trenchant and provocative--yet always balanced and complete--discussions of the central issues in a given discipline or field. Every Very Short Introduction gives a readable evolution of the subject in question, demonstrating how the subject has developed and how it has influenced society. Eventually, the series will encompass every major academic discipline, offering all students an accessible and abundant reference library. Whatever the area of study that one deems important or appealing, whatever the topic that fascinates the general reader, the Very Short Introductions series has a handy and affordable guide that will likely prove indispensable.

Cosmology

Inflationary cosmology has been developed over the last twenty years to remedy serious shortcomings in the standard hot big bang model of the universe. This textbook, first published in 2005, explains the basis of

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modern cosmology and shows where the theoretical results come from. The book is divided into two parts; the first deals with the homogeneous and isotropic model of the Universe, the second part discusses how inhomogeneities can explain its structure. Established material such as the inflation and quantum cosmological perturbation are presented in great detail, however the reader is brought to the frontiers of current cosmological research by the discussion of more speculative ideas. An ideal textbook for both advanced students of physics and astrophysics, all of the necessary background material is included in every chapter and no prior knowledge of general relativity and quantum field theory is assumed.

The History of Astronomy: A Very Short Introduction

Physics, the fundamental science of matter and energy, encompasses all levels of nature from the subatomic to the cosmic, and underlies much of the technology around us. Understanding the physics of our universe is an essential aspect of humanity's quest to understand our environment and our place within it. Doing physics enables us to explore the interaction between environment and human society, and can help us to work towards the future sustainability of the planet. This Very Short Introduction provides an overview of how this pervasive science came to be and how it works: who funds it, how physicists are trained and how they think, and how physics supports the technology we all use. Sidney Perkowitz presents the theories and

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outcomes of pure and applied physics from ideas of the Greek natural philosophers to modern quantum mechanics, cosmology, digital electronics and energy production. Considering its most consequential experiments, including recent results in elementary particles, gravitational waves and materials science, he also discusses outside the lab, the effects of physics on society, culture, and humanity's vision of its place in the universe. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Mormonism: A Very Short Introduction

In this Very Short Introduction Timothy Clifton looks at the development of our understanding of gravity since the early observations of Kepler and Newtonian theory. He discusses Einstein's theory of gravity, which now supplants Newton's, showing how it allows us to understand why the frequency of light changes as it passes through a gravitational field, why GPS satellites need their clocks corrected as they orbit the Earth, and why the orbits of distant neutron stars speed up. Today, almost 100 years after Einstein published his theory of gravity, we have even detected the waves of gravitational radiation that he predicted. Clifton concludes by considering the testing and application of general relativity in

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astrophysics and cosmology, and looks at dark energy and efforts such as string theory to combine gravity with quantum mechanics.

African Religions

Have you ever wondered how it's possible to build a skyscraper, a big bridge, a jumbo jet, or a cruise liner? Everything has structure. Structure is the difference between a random pile of components and a fully functional object. Through structure the parts connect to make the whole. Natural structures vary from the very smallest part of an atom to the entire cosmology of the universe. Man-made structures include buildings, bridges, dams, ships, aeroplanes, rockets, trains, cars and fair-ground rides and all forms of artefacts, even large artistic sculptures. The wide range of different industries in which structural engineers work includes construction, transport, manufacturing, and aerospace. In this Very Short Introduction, David Blockley explores, in non-technical language, what structural engineering is all about, including examples ranging from the Shard in London and the Golden Gate Bridge in San Francisco to jumbo jets like the A380 and the Queen Elizabeth cruise liner. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Nothing: A Very Short Introduction

The cutting-edge science that is taking the measure of the universe *The Little Book of Cosmology* provides a breathtaking look at our universe on the grandest scales imaginable. Written by one of the world's leading experimental cosmologists, this short but deeply insightful book describes what scientists are revealing through precise measurements of the faint thermal afterglow of the Big Bang—known as the cosmic microwave background, or CMB—and how their findings are transforming our view of the cosmos. Blending the latest findings in cosmology with essential concepts from physics, Lyman Page first helps readers to grasp the sheer enormity of the universe, explaining how to understand the history of its formation and evolution in space and time. Then he sheds light on how spatial variations in the CMB formed, how they reveal the age, size, and geometry of the universe, and how they offer a blueprint for the formation of cosmic structure. Not only does Page explain current observations and measurements, he describes how they can be woven together into a unified picture to form the Standard Model of Cosmology. Yet much remains unknown, and this incisive book also describes the search for ever deeper knowledge at the field's frontiers—from quests to understand the nature of neutrinos and dark energy to investigations into the physics of the very early universe.

Structural Engineering: A Very Short Introduction

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This book accompanies another book by the same authors, and presents the theory of the evolution of density perturbations and relic gravity waves, theory of cosmological inflation and post-inflationary reheating. Written in a pedagogical style, the main chapters give a detailed account of the established theory, with derivation of formulas. Being self-contained, it is a useful textbook for advanced undergraduate students and graduate students. Essential materials from General Relativity, theory of Gaussian random fields and quantum field theory are collected in the appendices. The more advanced topics are approached similarly in a pedagogical way. These parts may serve as a detailed introduction to current research.

The Sun: A Very Short Introduction

Proving to be both varied and fascinating, moons are far more common than planets in our Solar System. Our own Moon has had a profound influence on Earth, not only through tidal effects, but even on the behaviour of some marine animals. Many remarkable things have been discovered about the moons of the giant outer planets from Voyager, Galileo, Cassini, and other spacecraft. Scientists have glimpsed volcanic activity on Io, found oceans of water on Titan, and captured photos of icy geysers bursting from Enceladus. It looks likely that microbial life beyond the Earth may be discovered on a moon rather than a planet. In this Very Short Introduction David Rothery introduces the reader to the moons of our Solar System, beginning with the early discoveries

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of Galileo and others, describing their variety of mostly mythological names, and the early use of Jupiter's moons to establish position at sea and to estimate the speed of light. Rothery discusses the structure, formation, and influence of our Moon, and those of the other planets, and ends with the recent discovery of moons orbiting asteroids, whilst looking forward to the possibility of finding moons of exoplanets in planetary systems far beyond our own. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

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A substantial update of this award-winning and highly regarded cosmology textbook, for advanced undergraduates in physics and astronomy.

Black Holes: A Very Short Introduction

Galaxies are the building blocks of the Universe: standing like islands in space, they are where the stars are born and where extraordinary phenomena can be observed. Many exciting discoveries have been made: how a supermassive black hole lurks at the centre of every galaxy, how enormous forces are released when galaxies collide, and what the

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formation of young galaxies can tell us about the mysteries of Cold Dark Matter. In this Very Short Introduction, renowned science writer John Gribbin describes the extraordinary things that astronomers are learning about galaxies, and explains how this can shed light on the origins and structure of the Universe.

Quantum Theory: A Very Short Introduction

Why do we measure time in the way that we do? Why is a week seven days long? At what point did minutes and seconds come into being? Why are some calendars lunar and some solar? The organisation of time into hours, days, months and years seems immutable and universal, but is actually far more artificial than most people realise. The French Revolution resulted in a restructuring of the French calendar, and the Soviet Union experimented with five and then six-day weeks. Leofranc Holford-Strevens explores these questions using a range of fascinating examples from Ancient Rome and Julius Caesar's imposition of the Leap Year, to the 1920s' project for a fixed Easter. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

Galaxies: A Very Short Introduction

The Sun, as our nearest star, is of enormous importance for life on Earth - providing the warm radiation and light which allowed complex life to evolve. The Sun plays a key role in influencing our climate, whilst solar storms and high-energy events can threaten our communication infrastructure and satellites. This Very Short Introduction explores what we know about the Sun, its physics, its structure, origins, and future evolution. Philip Judge explains some of the remaining puzzles about the Sun that still confound us, using elementary physics, and mathematical concepts. Why does the Sun form spots? Why does it flare? As he shows, these and other nagging difficulties relate to the Sun's continually variable magnetism, which converts an otherwise dull star into a machine for flooding interplanetary space with variable radiation, high-energy particles and magnetic ejections. Throughout, Judge highlights the many reasons that the Sun is important, and why scientists engage in solar research. ABOUT THE SERIES: The Very Short Introductions series from Oxford University Press contains hundreds of titles in almost every subject area. These pocket-sized books are the perfect way to get ahead in a new subject quickly. Our expert authors combine facts, analysis, perspective, new ideas, and enthusiasm to make interesting and challenging topics highly readable.

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