What In The Universe

We Have No Idea

'This witty book reveals the humbling vastness of our ignorance about the universe, along with charming insights into what we actually do understand' Carlo Rovelli, author of Seven Brief Lessons on Physics and Reality Is Not What It Seems In our small corner of the universe, we know how some matter behaves most of the time and what even less of it looks like, and we have some good guesses about where it all came from. But we really have no clue what's going on. In fact, we don't know what about 95% of the universe is made of. So what happens when a cartoonist and a physicist walk into this strange, mostly unknown universe? Jorge Cham and Daniel Whiteson gleefully explore the biggest unknowns, why these things are still mysteries, and what a lot of smart people are doing to figure out the answers (or at least ask the right questions). While they're at it, they helpfully demystify many complicated things we do know about, from quarks and neutrinos to gravitational waves and exploding black holes. With equal doses of humour and delight, they invite us to see the universe as a vast expanse of mostly uncharted territory that's still ours to explore. This is a book for fans of Brian Cox and What If. This highly entertaining highly illustrated book is perfect for anyone who's curious about all the great mysteries physicists are going to solve next.

A Universe from Nothing

Bestselling author and acclaimed physicist Lawrence Krauss offers a paradigm-shifting view of how everything that exists came to be in the first place. “Where did the universe come from? What was there before it? What will the future bring? And finally, why is there something rather than nothing?” One of the few prominent scientists today to have crossed the chasm between science and popular culture, Krauss describes the staggeringly beautiful experimental observations and mind-bending new theories that demonstrate not only can something arise from nothing, something will always arise from nothing. With a new preface about the significance of the discovery of the Higgs particle, A Universe from Nothing uses Krauss’s characteristic wry humor and wonderfully clear explanations to take us back to the beginning of the beginning, presenting the most recent evidence for how our universe evolved—and the implications for how it’s going to end. Provocative, challenging, and delightfully readable, this is a game-changing look at the most basic underpinning of existence and a powerful antidote to outmoded philosophical, religious, and scientific thinking.

Our Place in the Universe

Our Place in the Universe tells the story of our world, formation of the first galaxies and stars formed from great clouds containing the primordial elements made in the first few minutes; birth of stars, their lives and deaths in fiery supernova explosions; formation of the solar system, its planets and many moons; life on Earth, its needs and vicissitudes on land and in the seas; finally exoplanets, planets that surround distant stars. Interspersed in the text are short pieces on some of those who revealed these wonders to us.It is written in a very authoritative and readable form and contains more than 100 color prints of the marvelous galaxies, and nebula that have been taken from space-based and land-based telescopes carried by NASA missions, the European Space Agency, the European Southern Laboratory in Chile and many other sources.

The Biggest Ideas in the Universe

INSTANT NEW YORK TIMES BESTSELLER “Most appealing... technical accuracy and lightness of tone... Impeccable.”—Wall Street Journal “A porthole into another world.”—Scientific American “Brings

science dissemination to a new level."—Science The most trusted explainer of the most mind-boggling concepts pulls back the veil of mystery that has too long cloaked the most valuable building blocks of modern science. Sean Carroll, with his genius for making complex notions entertaining, presents in his uniquely lucid voice the fundamental ideas informing the modern physics of reality. Physics offers deep insights into the workings of the universe but those insights come in the form of equations that often look like gobbledygook. Sean Carroll shows that they are really like meaningful poems that can help us fly over sierras to discover a miraculous multidimensional landscape alive with radiant giants, warped space-time, and bewilderingly powerful forces. High school calculus is itself a centuries-old marvel as worthy of our gaze as the Mona Lisa. And it may come as a surprise the extent to which all our most cutting-edge ideas about black holes are built on the math calculus enables. No one else could so smoothly guide readers toward grasping the very equation Einstein used to describe his theory of general relativity. In the tradition of the legendary Richard Feynman lectures presented sixty years ago, this book is an inspiring, dazzling introduction to a way of seeing that will resonate across cultural and generational boundaries for many years to come.

The Mysteries of the Universe

Journey from Earth to the outer reaches of the universe with this stunning book about space! You'll encounter bizarre planets, distant stars, and intricate galaxies. Every page of this captivating book reveals the secrets behind more than 100 celestial objects, from planets, asteroids to black holes and galaxies. Get ready to explore fun facts and exciting new scientific discoveries! For centuries, the mysteries of space have captured our imaginations. This picture book will illuminate imaginations and spark curious minds to explore the vastness of space. Take your little astronaut on a journey from our planet out into the furthest reaches of the universe! Filled with gorgeous illustrations and incredible photography, young readers will be intrigued by the detailed close-up images of each celestial body. The engaging storybook-style descriptions and simple text shed a light on facts, myths, and key discoveries about the universe! Explore the wonders of our solar system and beyond. This educational book also includes reference pages packed with fascinating information. Journey Through the Vastness of Space Join us on an adventure across the universe, as we rocket to the stars! Discover 100 objects from the universe, arranged from the closest to our planet to the ones furthest away. Storybook-style text and out-of-this-world pictures make this book perfect for an astronomical bedtime. It's also a fantastic gift for children who can't get enough of space. Grab your spacesuit and put your helmet on! Inside the pages of this adventure book, you'll find: - Beautiful illustrations and incredible photography that showcase the mysteries of space. - Discover 100 remarkable objects in the cosmos. - Engaging storybook-style descriptions that explain key discoveries about the universe. More to Explore Once you've discovered The Mysteries of the Universe, dive into the companion titles from this series from DK Books! The Wonders of Nature explores more than 100 items from the natural world and An Anthology of Intriguing Animals showcases animals from around the world.

The Five Ages of the Universe

This book takes readers on a fantastic voyage to the physics of eternity, with a long-term projection of the evolution of the universe.

The Universe in a Nutshell

Stephen Hawking s A Brief History of Time was a publishing phenomenon. Translated into thirty languages, it has sold over nine million copies worldwide. It continues to captivate and inspire new readers every year. When it was first published in 1988 the ideas discussed in it were at the cutting edge of what was then known about the universe. In the intervening years there have been extraordinary advances in our understanding of the space and time. The technology for observing the micro- and macro-cosmic world has developed in leaps and bounds. During the same period cosmology and the theoretical sciences have entered a new golden age. Professor Stephen Hawking has been at the heart of this new scientific renaissance. Now, in The Universe in a Nutshell, Stephen Hawking brings us fully up-to-date with the advances in scientific thinking. We are now

nearer than we have ever been to a full understanding of the universe. In a fascinating and accessible discussion that ranges from quantum mechanics, to time travel, black holes to uncertainty theory, to the search for science s Holy Grail the unified field theory (or in layman s terms the theory of absolutely everything) Professor Hawking once more takes us to the cutting edge of modern thinking. Beautifully illustrated throughout, with original artwork commissioned for this project, The Universe in a Nutshell is guaranteed to be the biggest science book of 2001.

Why the Universe is the Way it is

Hugh Ross, founder and president of Reasons to Believe, reveals the universe's design, its purposes, and God's surpassing love for his creation.

Journey of the Universe

The authors tell the epic story of the universe from an inspired new perspective, weaving the findings of modern science together with enduring wisdom found in the humanistic traditions of the West, China, India, and indigenous peoples. This book is part of a larger project that includes a documentary film, educational DVD series, and Web site.

You Are the Universe

THE NEW YORK TIMES BESTSELLER In this book, that combines cutting edge science with real world applications, Chopra and Kafatos redefine our nature of reality and what is possible. Here they ask 9 questions: What Came Before the Big Bang? Why Does the Universe Fit Together So Perfectly? Where Did Time Come From? What Is the Universe Made Of? Is There Design in the Universe? Is the Quantum World Linked to Everyday Life? Do We Live in a Conscious Universe? How Did Life First Begin? Does the brain create the mind? You Are The Universe offers answers that open up new possibilities for all of us to lead more fruitful, peaceful and successful lives.

Life in the Universe, 5th Edition

The world’s leading textbook on astrobiology—ideal for an introductory one-semester course and now fully revised and updated Are we alone in the cosmos? How are scientists seeking signs of life beyond our home planet? Could we colonize other planets, moons, or even other star systems? This introductory textbook, written by a team of four renowned science communicators, educators, and researchers, tells the amazing story of how modern science is seeking the answers to these and other fascinating questions. They are the questions that are at the heart of the highly interdisciplinary field of astrobiology, the study of life in the universe. Written in an accessible, conversational style for anyone intrigued by the possibilities of life in the solar system and beyond, Life in the Universe is an ideal place to start learning about the latest discoveries and unsolved mysteries in the field. From the most recent missions to Saturn’s moons and our neighboring planet Mars to revolutionary discoveries of thousands of exoplanets, from the puzzle of life’s beginning on Earth to the latest efforts in the search for intelligent life elsewhere, this book captures the imagination and enriches the reader’s understanding of how astronomers, planetary scientists, biologists, and other scientists make progress at the cutting edge of this dynamic field. Enriched with a wealth of engaging features, this textbook brings any citizen of the cosmos up to speed with the scientific quest to discover whether we are alone or part of a universe full of life. An acclaimed text designed to inspire students of all backgrounds to explore foundational questions about life in the cosmos Completely revised and updated to include the latest developments in the field, including recent exploratory space missions to Mars, frontier exoplanet science, research on the origin of life on Earth, and more Enriched with helpful learning aids, including in-chapter Think about It questions, optional Do the Math and Special Topic boxes, Movie Madness boxes, end-of-chapter exercises and problems, quick quizzes, and much more Supported by instructor’s resources, including an illustration package and test bank, available upon request

Science and Creationism

This edition of Science and Creationism summarizes key aspects of several of the most important lines of evidence supporting evolution. It describes some of the positions taken by advocates of creation science and presents an analysis of these claims. This document lays out for a broader audience the case against presenting religious concepts in science classes. The document covers the origin of the universe, Earth, and life; evidence supporting biological evolution; and human evolution. (Contains 31 references.) (CCM)

The Particle at the End of the Universe

\"The Higgs boson ... is the key to understanding why mass exists and how atoms are possible. After billions of dollars and decades of effort by more than six thousand researchers at the Large Hadron Collider in Switzerland--a doorway is opening into the mind-boggling world of dark matter and beyond. Caltech physicist and acclaimed writer Sean Carroll explains both the importance of the Higgs boson and the ultimately human story behind the greatest scientific achievement of our time\"--Publisher.

Signs of the Universe

In Signs of the Universe, Ulla Suokko invites you to play with the Universe and follow signs to your peace and freedom. Through stories, ideas, and activities, she leads you into the infinite now, where everything is possible.

What in the Universe?

A fun-filled book based on Steven Universe, the hugely popular Cartoon Network show about Steven, a lovable boy with growing magical abilities and the Crystal Gems, a trio of powerful women who watch over Steven and protect humankind. This 208-page Steven Universe trivia book contains 300 awesome facts about Steven and his family, the Crystal Gems, and the cast of characters from Beach City. Get answers to burning questions like, \"Where does Lion come from?\

Welcome to the Universe

An essential companion to the New York Times bestseller Welcome to the Universe Here is the essential companion to Welcome to the Universe, a New York Times bestseller that was inspired by the enormously popular introductory astronomy course for non science majors that Neil deGrasse Tyson, Michael A. Strauss, and J. Richard Gott taught together at Princeton. This problem book features more than one hundred problems and exercises used in the original course—ideal for anyone who wants to deepen their understanding of the original material and to learn to think like an astrophysicist. Whether you’re a student or teacher, citizen scientist or science enthusiast, your guided tour of the cosmos just got even more hands-on with Welcome to the Universe: The Problem Book. The essential companion book to the acclaimed bestseller Features the problems used in the original introductory astronomy course for non science majors at Princeton University Organized according to the structure of Welcome to the Universe, empowering readers to explore real astrophysical problems that are conceptually introduced in each chapter Problems are designed to stimulate physical insight into the frontier of astrophysics Problems develop quantitative skills, yet use math no more advanced than high school algebra Problems are often multipart, building critical thinking and quantitative skills and developing readers’ insight into what astrophysicists do Ideal for course use—either in tandem with Welcome to the Universe or as a supplement to courses using standard astronomy textbooks—or self-study Tested in the classroom over numerous semesters for more than a decade Prefaced with a review of relevant concepts and equations Full solutions and explanations are provided, allowing students and other readers to check their own understanding

Your Place in the Universe

An astrophysicist presents an in-depth yet accessible tour of the universe for lay readers, while conveying the excitement of astronomy. How is a galaxy billions of lightyears away connected to us? Is our home nothing more than a tiny speck of blue in an ocean of night? In this exciting tour of a universe far larger than we can imagine, cosmologist Paul M. Sutter emphasizes how amazing it is that we are part of such a huge, complex, and mysterious place. Through metaphors and uncomplicated language, Sutter breathes life into the science of astrophysics, unveiling how particles, forces, and fields interplay to create the greatest of cosmic dramas. Touched with the author's characteristic breezy, conversational style--which has made him a breakout hit on venues such as The Weather Channel, the Science Channel, and his own popular Ask a Spaceman! podcast--he conveys the fun and wonder of delving deeply into the physical processes of the natural universe. He weaves together the past and future histories of our universe with grounded descriptions of essential modern-day physics as well as speculations based on the latest research in cosmology. Topics include our place in the Milky Way galaxy; the cosmic web--a vast web-like pattern in which galaxies are arranged; the origins of our universe in the big bang; the mysteries of dark matter and dark energy; how science has dramatically changed our relationship to the cosmos; conjectures about the future of reality as we know it; and more. For anyone who has ever stared at the starry night sky and wondered how we humans on Earth fit into the big picture, this book is an essential roadmap.

The End of Everything

NAMED A BEST BOOK OF THE YEAR BY THE ECONOMIST, OBSERVER, NEW SCIENTIST, BBC FOCUS, INDEPENDENT AND WASHINGTON POST 'A rollicking tour of the wildest physics. . . Like an animated discussion with your favourite quirky and brilliant professor' Leah Crane, New Scientist 'Weird science, explained beautifully' - John Scalzi We know the universe had a beginning. But what happens at the end of the story? With lively wit and wry humour, astrophysicist Katie Mack takes us on a mind-bending tour through each of the cosmos' possible finales: the Big Crunch, Heat Death, Vacuum Decay, the Big Rip and the Bounce. Guiding us through major concepts in quantum mechanics, cosmology, string theory and much more, she describes how small tweaks to our incomplete understanding of reality can result in starkly different futures. Our universe could collapse in upon itself, or rip itself apart, or even - in the next five minutes - succumb to an inescapable expanding bubble of doom. This captivating story of cosmic escapism examines a mesmerizing yet unfamiliar physics landscape while sharing the excitement a leading astrophysicist feels when thinking about the universe and our place in it. Amid stellar explosions and bouncing universes, Mack shows that even though we puny humans have no chance of changing how it all ends, we can at least begin to understand it. The End of Everything is a wildly fun, surprisingly upbeat ride to the farthest reaches of all that we know.

Our Universe

A BBC Sky at Night Best Astronomy and Space Book of the Year “[A] luminous guide to the cosmos...Jo Dunkley swoops from Earth to the observable limits, then explores stellar life cycles, dark matter, cosmic evolution and the soup-to-nuts history of the Universe.” —Nature “A grand tour of space and time, from our nearest planetary neighbors to the edge of the observable Universe...If you feel like refreshing your background knowledge...this little gem certainly won’t disappoint.” —Govert Schilling, BBC Sky at Night Most of us have heard of black holes and supernovas, galaxies and the Big Bang. But few understand more than the bare facts about the universe we call home. What is really out there? How did it all begin? Where are we going? Jo Dunkley begins in Earth’s neighborhood, explaining the nature of the Solar System, the stars in our night sky, and the Milky Way. She traces the evolution of the universe from the Big Bang fourteen billion years ago, past the birth of the Sun and our planets, to today and beyond. She then explains cutting-edge debates about such perplexing phenomena as the accelerating expansion of the universe and the possibility that our universe is only one of many. Our Universe conveys with authority and grace the thrill of scientific discovery and a contagious enthusiasm for the endless wonders of space-time.

Probable Impossibilities

The acclaimed author of Einstein’s Dreams tackles \"big questions like the origin of the universe and the nature of consciousness ... in an entertaining and easily digestible way” (Wall Street Journal) with a collection of meditative essays on the possibilities—and impossibilities—of nothingness and infinity, and how our place in the cosmos falls somewhere in between. Can space be divided into smaller and smaller units, ad infinitum? Does space extend to larger and larger regions, on and on to infinity? Is consciousness reducible to the material brain and its neurons? What was the origin of life, and can biologists create life from scratch in the lab? Physicist and novelist Alan Lightman, whom The Washington Post has called “the poet laureate of science writers,” explores these questions and more—from the anatomy of a smile to the capriciousness of memory to the specialness of life in the universe to what came before the Big Bang. Probable Impossibilities is a deeply engaged consideration of what we know of the universe, of life and the mind, and of things vastly larger and smaller than ourselves.

Biocentrism

Robert Lanza is one of the most respected scientists in the world — a US News & World Report cover story called him a “genius\" and a “renegade thinker,\" even likening him to Einstein. Lanza has teamed with Bob Berman, the most widely read astronomer in the world, to produce Biocentrism, a revolutionary new view of the universe. Every now and then a simple yet radical idea shakes the very foundations of knowledge. The startling discovery that the world was not flat challenged and ultimately changed the way people perceived themselves and their relationship with the world. For most humans of the 15th century, the notion of Earth as ball of rock was nonsense. The whole of Western, natural philosophy is undergoing a sea change again, increasingly being forced upon us by the experimental findings of quantum theory, and at the same time, towards doubt and uncertainty in the physical explanations of the universe's genesis and structure. Biocentrism completes this shift in worldview, turning the planet upside down again with the revolutionary view that life creates the universe instead of the other way around. In this paradigm, life is not an accidental byproduct of the laws of physics. Biocetnrism takes the reader on a seemingly improbable but ultimately inescapable journey through a foreign universe—our own—from the viewpoints of an acclaimed biologist and a leading astronomer. Switching perspective from physics to biology unlocks the cages in which Western science has unwittingly managed to confine itself. Biocentrism will shatter the reader's ideas of life--time and space, and even death. At the same time it will release us from the dull worldview of life being merely the activity of an admixture of carbon and a few other elements; it suggests the exhilarating possibility that life is fundamentally immortal. The 21st century is predicted to be the Century of Biology, a shift from the previous century dominated by physics. It seems fitting, then, to begin the century by turning the universe outside-in and unifying the foundations of science with a simple idea discovered by one of the leading life-scientists of our age. Biocentrism awakens in readers a new sense of possibility, and is full of so many shocking new perspectives that the reader will never see reality the same way again.

Unlocking the Universe

Discover the universe in a nutshell, with chapters on everything from the creation of the universe to time travel to the future of humanity, all in an easy-to-read, illustrated package. Have you ever wondered how our universe began? Or what it takes to put humans on the moon? Do you know what happens in the microscopic world of a life-saving vaccine? What would you do if you could travel through space and time? Embark on the adventure of a lifetime in this beautiful collection of up-to-the-minute essays, mind-blowing facts and out-of-this-world colour photographs, by the world's leading scientists including Professor Stephen Hawking himself. This unmissable volume was curated by Stephen and Lucy Hawking, whose George series of children's books was a global hit. The series is punctuated with fascinating real-life facts and insights from leading scientists. Now this incredible non-fiction has been collected into one bumper volume, with new content from key scientific figures and up-to-the-minute facts and figures for readers young and old. The ideal book for curious young readers everywhere. READERS LOVE UNLOCKING THE UNIVERSE: \"Despite its scientific content the essays are written in a very accessible style and the many topics

investigated which range from the physical explanations of the universe to earth science to robotics and future predictions. Highly recommended for curious minds from around 10 years upwards\" - Sue Warren, Blogger \"My 9 y.o. loves this book. We've previously discussed a lot of the concepts, but this seems to answer questions I hadn't thought of, but my son wanted to know\" \"A glorious scientific gaze at our world, and the universe beyond in a fact-filled volume that will keep curious kids occupied for ages\" - ReadItDaddy blog \"An excellent book that will do wonders to raise enthusiasm for science among young and old readers alike\" - Jonali Karmakar, Blogger

The Biological Universe

Current state of play in astrobiology, including exoplanets and their atmospheres, habitable zones and the likelihood of evolution elsewhere.

Astronomy

This book brings together reviews from leading international authorities on the developments in the study of dark matter and dark energy, as seen from both their cosmological and particle physics side. Studying the physical and astrophysical properties of the dark components of our Universe is a crucial step towards the ultimate goal of unveiling their nature. The work developed from a doctoral school sponsored by the Italian Society of General Relativity and Gravitation. The book starts with a concise introduction to the standard cosmological model, as well as with a presentation of the theory of linear perturbations around a homogeneous and isotropic background. It covers the particle physics and cosmological aspects of dark matter and (dynamical) dark energy, including a discussion of how modified theories of gravity could provide a possible candidate for dark energy. A detailed presentation is also given of the possible ways of testing the theory in terms of cosmic microwave background, galaxy redshift surveys and weak gravitational lensing observations. Included is a chapter reviewing extensively the direct and indirect methods of detection of the hypothetical dark matter particles. Also included is a self-contained introduction to the techniques and most important results of numerical (e.g. N-body) simulations in cosmology. \" This volume will be useful to researchers, PhD and graduate students in Astrophysics, Cosmology Physics and Mathematics, who are interested in cosmology, dark matter and dark energy.

Dark Matter and Dark Energy

In consequence of a number of stunning catastrophes, Arthur Dent is surprised to find himself living in a hideously miserable cave on prehistoric Earth. However, just as he thinks that things cannot get possibly worse, they suddenly do. He discovers that the Galaxy is not only mind-boggingly big and bewildering but also that most of the things that happen in it are staggeringly unfair. VOLUME THREE IN THE TRILOGY OF FIVE.

Life, the Universe and Everything

The clearest, most visual e-guide to space and the Universe for complete beginners to astronomy. Have you ever asked yourself how big the Universe is, how far it is to the nearest star, or what came before the Big Bang? Then this is the book for you. How Space Works shows you the different types of object in the Universe (so you'll know your pulsars from your quasars) and introduces you to some of the strangest and most wonderful things known to science, including dark matter particles and ancient white dwarf stars that are almost as old as the Universe itself. The ebook starts with an explanation of our view of the Universe from Earth, then takes a tour of the Solar System, the stars and galaxies, and the furthest reaches of space. The last chapter looks at the technology we use to explore the Universe, from the International Space Station to Mars rovers and the new and revolutionary reusable rockets. Illustrated with bold graphics and step-by-step artworks - and peppered with bite-sized factoids and question-and- answer features - this is the perfect introduction to astronomy and space exploration.

How Space Works

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.

The Little Book of Cosmology

Physicists argue from different perspectives for and against the idea of the existence of multiple universes.

Universe Or Multiverse?

A practical answer guide to humankind's age-old questions on planets, our universe and everything beyond and between.

A Question and Answer Guide to Astronomy

An award-winning science journalist details the quest to isolate and understand dark matter--and shows how that search has helped us to understand the universe we inhabit. When you train a telescope on outer space, you can see luminous galaxies, nebulae, stars, and planets. But if you add all that together, it constitutes only 15 percent of the matter in the universe. Despite decades of research, the nature of the remaining 85 percent is unknown. We call it dark matter. In The Elephant in the Universe, Govert Schilling explores the fascinating history of the search for dark matter. Evidence for its existence comes from a wealth of astronomical observations. Theories and computer simulations of the evolution of the universe are also suggestive: they can be reconciled with astronomical measurements only if dark matter is a dominant component of nature. Physicists have devised huge, sensitive instruments to search for dark matter, which may be unlike anything else in the cosmos--some unknown elementary particle. Yet so far dark matter has escaped every experiment. Indeed, dark matter is so elusive that some scientists are beginning to suspect there might be something wrong with our theories about gravity or with the current paradigms of cosmology. Schilling interviews both believers and heretics and paints a colorful picture of the history and current status of dark matter research, with astronomers and physicists alike trying to make sense of theory and observation. Taking a holistic view of dark matter as a problem, an opportunity, and an example of science in action, The Elephant in the Universe is a vivid tale of scientists puzzling their way toward the true nature of the universe.

The Elephant in the Universe

In recent years, planetary science has seen a tremendous growth in new knowledge. Deposits of water ice exist at the Moon's poles. Discoveries on the surface of Mars point to an early warm wet climate, and perhaps conditions under which life could have emerged. Liquid methane rain falls on Saturn's moon Titan, creating

rivers, lakes, and geologic landscapes with uncanny resemblances to Earth's. Vision and Voyages for Planetary Science in the Decade 2013-2022 surveys the current state of knowledge of the solar system and recommends a suite of planetary science flagship missions for the decade 2013-2022 that could provide a steady stream of important new discoveries about the solar system. Research priorities defined in the report were selected through a rigorous review that included input from five expert panels. NASA's highest priority large mission should be the Mars Astrobiology Explorer Cacher (MAX-C), a mission to Mars that could help determine whether the planet ever supported life and could also help answer questions about its geologic and climatic history. Other projects should include a mission to Jupiter's icy moon Europa and its subsurface ocean, and the Uranus Orbiter and Probe mission to investigate that planet's interior structure, atmosphere, and composition. For medium-size missions, Vision and Voyages for Planetary Science in the Decade 2013-2022 recommends that NASA select two new missions to be included in its New Frontiers program, which explores the solar system with frequent, mid-size spacecraft missions. If NASA cannot stay within budget for any of these proposed flagship projects, it should focus on smaller, less expensive missions first. Vision and Voyages for Planetary Science in the Decade 2013-2022 suggests that the National Science Foundation expand its funding for existing laboratories and establish new facilities as needed. It also recommends that the program enlist the participation of international partners. This report is a vital resource for government agencies supporting space science, the planetary science community, and the public.

Vision and Voyages for Planetary Science in the Decade 2013-2022

Astronomer Royal Martin Rees shows how the behaviour and origins of the universe can be explained by just six numbers. How did a single genesis event create billions of galaxies, black holes, stars and planets? How did atoms assemble - here on Earth, and perhaps on other worlds - into living beings intricate enough to ponder their origins? This book describes the recent avalanche of discoveries about the universe's fundamental laws, and the deep connections that exist between stars and atoms - the cosmos and the microscopic world. Just six numbers, imprinted in the big bang, determine the essence of our world, and this book devotes one chapter to explaining each.

Just Six Numbers

Life in the Universe takes non-science majors on a journey through the solar system and beyond, using a rigorous yet accessible introduction to astronomy, biology, and geology to explain natural phenomena and to explore profound scientific questions about astrobiology. The Third Edition has been thoroughly revised to include updated scientific discoveries, new Cosmic Context two-page spreads, and an updated Companion Website. Designed for astrobiology courses but also suitable for introductory astronomy courses, Life in the Universe captures your imagination by exploring fundamental pan-scientific questions: What is life? How did life begin on Earth? What are the most extreme forms of life currently known? Is it reasonable to imagine life beyond Earth? The text motivates you to develop basic reasoning skills and an understanding of the process of science through skillful writing and a wealth of pedagogical features, such as Learning Goals that keep you focused on key concepts. Sidebars provide optional mathematical material for courses that fulfill quantitative requirements.

Life in the Universe

Discover planets, stars and galaxies and explore intergalactic space Curious young minds will be fascinated by this detailed space book, packed with flaps to lift to reveal answers to some of the biggest questions in the universe.

See Inside the Universe

Have You Ever Wondered? What happens to our thoughts, experiences and consciousness when we die? Does God/Creation/The Great Mystery exist? If so, does It oversee our actions or have an agenda for the

earth and humanitys outcome? Are there multiple dimensions or realms, such as heaven, that co-exist with our world? How does a global or even a universal consciousness help us to survive, heal and most importantly evolve? Ultimately, is there a purpose for us to exist? If so what is that purpose? Dr. Mehring brings new information to these fascinating questions in hopes of furthering the discussion of what truly exists and our purpose. He shares a combination of his experiences that he has had with unique individuals that have died and come back. Despite their previous critical condition they come back with an expanded awareness and clarity, and are willing to share their experience and the knowledge they have gained. Dr. Mehring will also share case histories and knowledge from several patients that have broken through to soul awareness during deep hypnosis. Dr. Mehring will also look to the new partnership between frontier science and ancient religious texts in an effort to authenticate and verify that all he has witnessed is credible and will help humanity reach its greatest potential through knowing its purpose.

What in the Universe Are We Doing Here?

\"Our fascination with numbers begins when we are children, and continues, for most of us, throughout our lives. We start counting our fingers and toes, and end up balancing check books and calculating risk. So powerful is the appeal of numbers that many people ascribe to them a mystical significance. And there are some numbers whose importance even transcends the supernatural--these numbers work to explain our universe and how it behaves. In Cosmic Numbers, mathematics professor James Stein traces the discovery, evolution, and interrelationships of the great numbers in that define our world. Some numbers, like the speed of light and absolute zero, are well known to the general public. Others, such as Boltzmann's constant and the Chandrasekhar limit, are known only to those with a deep knowledge of science. But these numbers do far more than the average person might dare to imagine: they tell us how this world began, the way we were and the way we are, and what the future holds. Stein reveals the manner in which certain cosmic numbers came to light, the dramatis personae involved, and cutting-edge developments associated with these numbers. Many are the cornerstones of grand discoveries and theories. They represent landmarks in the history of intellectual achievement. And the stories of these numbers offer a novel understanding of physics, chemistry, astronomy, and ourselves. Much more than a gee-whiz collection of numbers, Cosmic Numbers illuminates why particular numbers are so important--both to scientists and to the rest of us. \"--Provided by publisher.

Cosmic Numbers

The Washington Post Notable Non-Fiction of 2013 “I can imagine few more enjoyable ways of thinking than to read this book.”—Sarah Bakewell, New York Times Book Review, front-page review Tackling the “darkest question in all of philosophy” with “raffish erudition” (Dwight Garner, New York Times), author Jim Holt explores the greatest metaphysical mystery of all: why is there something rather than nothing? This runaway bestseller, which has captured the imagination of critics and the public alike, traces our latest efforts to grasp the origins of the universe. Holt adopts the role of cosmological detective, traveling the globe to interview a host of celebrated scientists, philosophers, and writers, “testing the contentions of one against the theories of the other” (Jeremy Bernstein, Wall Street Journal). As he interrogates his list of ontological culprits, the brilliant yet slyly humorous Holt contends that we might have been too narrow in limiting our suspects to God versus the Big Bang. This “deft and consuming” (David Ulin, Los Angeles Times) narrative humanizes the profound questions of meaning and existence it confronts.

Why Does the World Exist?

NEW YORK TIMES BESTSELLER • In the final book of his astonishing career, Carl Sagan brilliantly examines the burning questions of our lives, our world, and the universe around us. These luminous, entertaining essays travel both the vastness of the cosmos and the intimacy of the human mind, posing such fascinating questions as how did the universe originate and how will it end, and how can we meld science and compassion to meet the challenges of the coming century? Here, too, is a rare, private glimpse of Sagan’s thoughts about love, death, and God as he struggled with fatal disease. Ever forward-looking and vibrant with

the sparkle of his unquenchable curiosity, Billions & Billions is a testament to one of the great scientific minds of our day. Praise for Billions & Billions “[Sagan’s] writing brims with optimism, clarity and compassion.”—Ft. Lauderdale Sun-Sentinel “Sagan used the spotlight of his fame to illuminate the abyss into which stupidity, greed, and the lust for power may yet dump us. All of those interests and causes are handsomely represented in Billions & Billions.”—The Washington Post Book World “Astronomer Carl Sagan didn’t live to see the millennium, but he probably has done more than any other popular scientist to prepare us for its arrival.”—Atlanta Journal & Constitution “Billions & Billions can be interpreted as the Silent Spring for the current generation. . . . Human history includes a number of leaders with great minds who gave us theories about our universe and origins that ran contrary to religious dogma. Galileo determined that the Earth revolved around the Sun, not the other way around. Darwin challenged Creationism with his Evolution of Species. And now, Sagan has given the world its latest challenge: Billions & Billions.”—San Antonio Express-News “[Sagan’s] inspiration and boundless curiosity live on in the gift of his work.”—Seattle Times & Post-Intelligencer “Couldn’t stay awake in your high school science classes? This book can help fill in the holes. Acclaimed scientist Carl Sagan combines his logic and knowledge with wit and humor to make a potentially dry subject enjoyable to read.”—The Dallas Morning News

Billions & Billions

The riveting and mesmerizing story behind a watershed period in human history, the discovery of the startling size and true nature of our universe. On New Years Day in 1925, a young Edwin Hubble released his finding that our Universe was far bigger, eventually measured as a thousand trillion times larger than previously believed. Hubble’s proclamation sent shock waves through the scientific community. Six years later, in a series of meetings at Mount Wilson Observatory, Hubble and others convinced Albert Einstein that the Universe was not static but in fact expanding. Here Marcia Bartusiak reveals the key players, battles of will, clever insights, incredible technology, ground-breaking research, and wrong turns made by the early investigators of the heavens as they raced to uncover what many consider one of most significant discoveries in scientific history.

The Day We Found the Universe