

# Origins Fourteen Billion Years Of Cosmic Evolution Neil Degrasse Tyson

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*Origins Fourteen Billion Years Of Cosmic Evolution Neil Degrasse Tyson*

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## VALERIE RAMOS

**Bang!** W. W. Norton & Company

“Who can ask for better cosmic tour guides?” —Michio Kaku Our true origins are not only human, or even terrestrial, but in fact cosmic. Drawing on recent scientific breakthroughs and cross-pollination among geology, biology, astrophysics, and cosmology, *Origins* illuminates the soul-stirring leaps in our understanding of the cosmos. This revised and updated edition features such startling discoveries as the now more than 5,000 detected exoplanets that promise to reveal exciting possibilities for life in the cosmos, and data from a new generation of ground-based and spaceborne observatories that have fundamentally changed what we know about the expanding universe—and maybe even the laws of physics themselves. From the first image of a galaxy’s birth to tantalizing evidence of water not only on Mars but also on the asteroid Ceres, as well as on

moons of Jupiter and Saturn, coauthors Neil deGrasse Tyson and Donald Goldsmith conduct an exhilarating tour of the cosmos with clarity and exuberance.

**Crania Americana** Princeton University Press

Taking advantage of recent advances throughout the sciences, Matthew Hedman brings the distant past closer to us than it has ever been. Here, he shows how scientists have determined the age of everything from the colonization of the New World over 13,000 years ago to the origin of the universe nearly fourteen billion years ago. Hedman details, for example, how interdisciplinary studies of the Great Pyramids of Egypt can determine exactly when and how these incredible structures were built. He shows how the remains of humble trees can illuminate how the surface of the sun has changed over the past ten millennia. And he also explores how the origins of the earth, solar system, and universe are being discerned with help from rocks that fall from the sky, the light from distant stars, and even the static seen on television sets. Covering a wide range of time scales, from the Big Bang to human history, *The Age of Everything* is a provocative and far-ranging look at how science has determined the age of everything from modern mammals to the oldest

stars, and will be indispensable for all armchair time travelers. “We are used to being told confidently of an enormous, measurable past: that some collection of dusty bones is tens of thousands of years old, or that astronomical bodies have an age of some billions. But how exactly do scientists come to know these things? That is the subject of this quite fascinating book. . . . As told by Hedman, an astronomer, each story is a marvel of compressed exegesis that takes into account some of the most modern and intriguing hypotheses.”—Steven Poole, *Guardian* “Hedman is worth reading because he is careful to present both the power and peril of trying to extract precise chronological data. These are all very active areas of study, and as you read Hedman you begin to see how researchers have to be both very careful and incredibly audacious, and how much of our understanding of ourselves—through history, through paleontology, through astronomy—depends on determining the age of everything.”—Anthony Doerr, *Boston Globe*  
**The 1619 Project** Disney Electronic Content  
 Award-winning children’s book creators Martin Jenkins and Grahame Baker-Smith team up for a large-scale look at our planet, from the big bang to the dinosaurs and beyond. Before humans took

their first steps, there were billions of years of vibrant and varied life-forms on Earth. Discover the story of our planet during this time, from the formation of the universe to the first mammals and all the incredible life that flourished in between. Covering ice ages and fossils, the first life in the sea and on land, the time of the dinosaurs, and the rise of mammals, Martin Jenkins navigates through millennia of prehistory in a style both enthralling and accessible. With superb illustrations from Kate Greenaway Medal winner Grahame Baker-Smith, this is a captivating journey through the life of our planet before we called it ours.

[The True Story of Modern Cosmology](#) Harvard University Press

Where did we come from? Where are we going? Homo sapiens is the most successful, the most widespread and the most influential species ever to walk the Earth. In the blink of an evolutionary eye we have spread around the globe, taken control of Earth's biological and mineral resources, transformed the environment, discovered the secrets of the universe and travelled into space. Yet just 7 million years ago, we were just another species of great ape making a quiet living in the forests of East Africa. We do not know exactly what this ancestor was like, but it was no more likely than a chimpanzee or gorilla to sail across the ocean, write a symphony, invent a steam engine or ponder the meaning of existence. How did we get from there to here? The Story of Human Origins recounts the most astonishing evolutionary tale ever told. Discover how our ancestors made the first tentative steps towards becoming human, how we lost our fur but gained language, fire and tools, how we strode out of Africa, invented farming and cities and ultimately created modern civilization - perhaps the only one of its kind in the Universe. Meet your long-lost ancestors, the other humans who once shared the planet with us, and learn where the story might end.

**The History Book** Candlewick Studio

Australopithecines, dinosaurs, trilobites--such fossils conjure up images of lost worlds filled with vanished organisms. But in the full history of life, ancient animals, even the trilobites, form only the half-billion-year tip of a nearly four-billion-year iceberg. Andrew Knoll explores the deep history of life from its origins on a young planet to the incredible Cambrian explosion, presenting a compelling new explanation for the emergence of biological novelty. The very latest discoveries in paleontology--many of them made by the author and his students--are integrated with emerging insights from molecular biology and earth system science to forge a broad understanding of how the biological diversity that surrounds us came to be. Moving from Siberia to Namibia to the Bahamas, Knoll shows how life and environment have evolved together through Earth's history. Innovations in biology have helped shape our air and oceans, and, just as surely, environmental change has influenced the course of evolution, repeatedly closing off opportunities for some species while opening avenues for others. Readers go into the field to confront fossils, enter the lab to discern the inner workings of cells, and alight on Mars to ask how our terrestrial experience can guide exploration for life beyond our planet. Along the way, Knoll brings us up-to-date on some of science's hottest questions, from the oldest fossils and claims of life beyond the Earth to the hypothesis of global glaciation and Knoll's own unifying concept of "permissive ecology." In laying bare Earth's deepest biological roots, Life on a Young Planet helps us understand our own place in the universe--and our responsibility as stewards of a world four billion years in the making. In a new preface, Knoll describes how the field has broadened and deepened in the decade since the book's original publication.

*The Origins of Everything in 100 Pages (More or Less)* W. W. Norton & Company

"Extraordinary.... A feast of history, an expert tour through thousands of years of war and conquest." —Jennifer Carson, New York Times Book Review In this far-reaching foray into the millennia-long relationship between science and military power, acclaimed astrophysicist Neil deGrasse Tyson and co-author Avis Lang examine how the methods and tools of astrophysics have been enlisted in the service of war. Spanning early celestial navigation to satellite-enabled warfare, *Accessory to War* is a richly researched and provocative examination of the intersection of science, technology, industry, and power that will introduce Tyson's millions of fans to yet another dimension of how the universe has shaped our lives and our world.

*Earth! My First 4.54 Billion Years* W. W. Norton & Company

"Microcosmos is nothing less than the saga of the life of the planet. Lynn Margulis and Dorion Sagan have put it all together, literally, in this extraordinary book, which is unlike any treatment of evolution for a general readership that I have encountered before. A fascinating account that we humans should be studying now for clues to our own survival."—From the Foreword by Dr. Lewis Thomas *Microcosmos* brings together the remarkable discoveries of microbiology in the later decades of the 20th century and the pioneering research of Dr. Margulis to create a vivid new

picture of the world that is crucial to our understanding of the future of the planet. Addressed to general readers, the book provides a beautifully written view of evolution as a process based on interdependency and their interconnectedness of all life on the planet.

[Universe Down to Earth](#) Joseph Henry Press

From the author of *Astrophysics for People in a Hurry* and the host of *Cosmos: A Spacetime Odyssey*, a memoir about growing up and a young man's budding scientific curiosity. This is the absorbing story of Neil deGrasse Tyson's lifelong fascination with the night sky, a restless wonder that began some thirty years ago on the roof of his Bronx apartment building and eventually led him to become the director of the Hayden Planetarium. A unique chronicle of a young man who at one time was both nerd and jock, Tyson's memoir could well inspire other similarly curious youngsters to pursue their dreams. Like many athletic kids he played baseball, won medals in track and swimming, and was captain of his high school wrestling team. But at the same time he was setting up a telescope on winter nights, taking an advanced astronomy course at the Hayden Planetarium, and spending a summer vacation at an astronomy camp in the Mojave Desert. Eventually, his scientific curiosity prevailed, and he went on to graduate in physics from Harvard and to earn a Ph.D. in astrophysics from Columbia. There followed postdoctoral research at Princeton. In 1996, he became the director of the Hayden Planetarium, where some twenty-five years earlier he had been awed by the spectacular vista in the sky theater. Tyson pays tribute to the key teachers and mentors who recognized his precocious interests and abilities, and helped him succeed. He intersperses personal reminiscences with thoughts on scientific literacy, careful science vs. media hype, the possibility that a meteor could someday hit the Earth, dealing with society's racial stereotypes, what science can and cannot say about the existence of God, and many other interesting insights about science, society, and the nature of the universe. Now available in paperback with a new preface and other additions, this engaging memoir will enlighten and inspire an appreciation of astronomy and the wonders of our universe.

[Time Travel in Einstein's Universe](#) Princeton University Press

What happened before the primordial fire of the Big Bang: a theory about the ultimate origin of the universe. In the beginning was the Big Bang: an unimaginably hot fire almost fourteen billion years ago in which the first elements were forged. The physical theory of the hot nascent universe—the Big Bang—was one of the most consequential developments in twentieth-century science. And yet it leaves many questions unanswered: Why is the universe so big? Why is it so old? What is the origin of structure in the cosmos? In *An Infinity of Worlds*, physicist Will Kinney explains a more recent theory that may hold the answers to these questions and even explain the ultimate origins of the universe: cosmic inflation, before the primordial fire of the Big Bang. Kinney argues that cosmic inflation is a transformational idea in cosmology, changing our picture of the basic structure of the cosmos and raising unavoidable questions about what we mean by a scientific theory. He explains that inflation is a remarkable unification of inner space and outer space, in which the physics of the very large (the cosmos) meets the physics of the very small (elementary particles and fields), closing in a full circle at the first moment of time. With quantum uncertainty its fundamental feature, this new picture of cosmic origins introduces the possibility that the origin of the universe was of a quantum nature. Kinney considers the consequences of eternal cosmic inflation. Can we come to terms with the possibility that our entire observable universe is one of infinitely many, forever hidden from our view?

*Across a Billion Years* W. W. Norton & Company

Presenting a rich array of stereoscopic color images, which can be viewed in 3D using a special stereo viewer that folds easily out of the cover of the book, this book reveals your cosmic environment as you have never seen it before. Journey into the vast depths of the observable universe by visualising the most spectacular images in astronomy in stereoscopic 3D. Welcome to the Universe in 3D takes you on a grand tour of the observable universe, guiding you through the most spectacular sights in the cosmos in a breathtaking 3D. Astronomy is the story of how humankind's perception of the two-dimensional dome of the sky evolved into a far deeper comprehension of an expanding three-dimensional cosmos. This book invites you to take part in this story by exploring the universe in depth, as revealed by cutting-edge astronomical research and observations. You will journey from the Moon through the solar system, out to exoplanets, distant nebulae, and galaxy clusters, until you finally reach the cosmic microwave background radiation (or CMB), the most distant light we can observe. The distances to these celestial wonders range from 1.3 light-seconds to 13.8 billion light-years. Along the way, the authors explain the fascinating features of what you are seeing, including how the 3D images were made using the

same technique that early astronomers devised to measure distances to objects in space. The dramatic 3D images in this one-of-a-kind book will astonish you, extending your vision out to the farthest reaches of the universe. You will never look up into the night sky the same way again.

**Astrophysics for Young People in a Hurry** Univ of California Press

NEW YORK TIMES BESTSELLER Bringing his cosmic perspective to civilization on Earth, Neil deGrasse Tyson shines new light on the crucial fault lines of our time—war, politics, religion, truth, beauty, gender, and race—in a way that stimulates a deeper sense of unity for us all. In a time when our political and cultural views feel more polarized than ever, Tyson provides a much-needed antidote to so much of what divides us, while making a passionate case for the twin chariots of enlightenment—a cosmic perspective and the rationality of science. After thinking deeply about how science sees the world and about Earth as a planet, the human brain has the capacity to reset and recalibrates life's priorities, shaping the actions we might take in response. No outlook on culture, society, or civilization remains untouched. With crystalline prose, *Starry Messenger* walks us through the scientific palette that sees and paints the world differently. From insights on resolving global conflict to reminders of how precious it is to be alive, Tyson reveals, with warmth and eloquence, an array of brilliant and beautiful truths that apply to us all, informed and enlightened by knowledge of our place in the universe.

**Letters from an Astrophysicist** HMH

Covering 13.8 billion years in some 100 pages, a concise, wryly intelligent history of everything, from the Big Bang to the advent of human civilization. With wonder, wit, and flair—and in record time and space—geophysicist David Bercovici explains how everything came to be everywhere, from the creation of stars and galaxies to the formation of Earth's atmosphere and oceans, to the origin of life and human civilization. Bercovici marries humor and legitimate scientific intrigue, rocketing readers across nearly fourteen billion years and making connections between the essential theories that give us our current understanding of topics as varied as particle physics, plate tectonics, and photosynthesis. Bercovici's unique literary endeavor is a treasure trove of real, compelling science and fascinating history, providing both science lovers and complete neophytes with an unforgettable introduction to the fields of cosmology, geology, genetics, climate science, human evolution, and more. "For determined minds hoping for cogent, clever explanations for what we know of the history of the universe, Bercovici nails it." —Shelf Awareness "Explaining life, the universe and everything in 100 pages may be a tall order, but physicist and volcano enthusiast Bercovici rises to the challenge. . . . Origins delivers on its promise—and (bonus!) it's even fun to read." —Discover "Clear, concise, comprehensive, and written with verve and a sense of humor, *The Origins of Everything* is a delightful journey through time from the big bang to the present day." —Doug Macdougall, author of *Frozen Earth*

*Starry Messenger* HarperCollins

Bringing demonstrations of the principles of nature into the living room, Tyson writes in a lucid, easygoing style that finally makes scientific literacy possible for enthusiasts and those with math and science phobias alike.

**Origin And Evolution Of The Universe: From Big Bang To Exobiology (Second Edition)** W. W. Norton & Company

We've all heard of the Big Bang, and yet few of us truly know what it is. Renowned for making difficult ideas much less difficult than they might first appear, Simon Singh is our perfect guide to explaining why cosmologists believe that the Big Bang is an accurate description of the origin and evolution of the universe. This highly readable and entertaining book tells the story of the many brilliant, often eccentric scientists who fought against the establishment idea of an eternal and unchanging cosmos. From such early Greek cosmologists as Anaximander to recent satellite measurements taken deep in space, Big Bang is a narrative full of anecdotes and personal histories. With characteristic clarity, Simon Singh tells the centuries-long story of mankind's attempt to understand how the universe came to be, a story which itself begins some 14 billion years ago (give or take a billion years). Simon Singh shows us that it is within the capability of all of us -- in his expert hands -- to understand the Big Bang: the fundamental theory in all of science, and a high point -- perhaps the high point -- of human achievement.

*The Sky Is Not the Limit* Basic Books

Presents a new perspective for looking at history from the origins of the universe to present day.

**Life on a Young Planet** One World

Neil deGrasse Tyson's #1 New York Times best-selling guide to the cosmos, adapted for young readers. From the basics of physics to big questions about the nature of space and time,

celebrated astrophysicist and science communicator Neil deGrasse Tyson breaks down the mysteries of the cosmos into bite-sized pieces. *Astrophysics for Young People in a Hurry* describes the fundamental rules and unknowns of our universe clearly—and with Tyson's characteristic wit, there's a lot of fun thrown in, too. This adaptation by Gregory Mone includes full-color photos, infographics, and extra explanations to make even the trickiest concepts accessible. Building on the wonder inspired by outer space, *Astrophysics for Young People in a Hurry* introduces an exciting field and the principles of scientific inquiry to young readers.

*Maps of Time* University of Chicago Press

A lighthearted nonfiction picture book about the formation and history of the Earth—told from the perspective of the Earth itself! "Hi, I'm Earth! But you can call me Planet Awesome." Prepare to learn all about Earth from the point-of-view of Earth herself! In this funny yet informative book, filled to the brim with kid-friendly facts, readers will discover key moments in Earth's life, from her childhood more than four billion years ago all the way up to present day. Beloved children's book author Stacy McAnulty helps Earth tell her story, and award-winning illustrator David Litchfield brings the words to life. The book includes back matter with even more interesting tidbits. This title

has Common Core connections.

[Accessory to War: The Unspoken Alliance Between Astrophysics and the Military](#) Penguin

This illustrated companion to the popular podcast and National Geographic Channel show is an eye-opening journey for anyone curious about our universe, space, astronomy and the complexities of the cosmos. For decades, beloved astrophysicist Neil deGrasse Tyson has interpreted science with a combination of brainpower and charm that resonates with fans everywhere. This pioneering, provocative book brings together the best of StarTalk, his beloved podcast and television show devoted to solving the most confounding mysteries of Earth, space, and what it means to be human. Filled with brilliant sidebars, vivid photography, and unforgettable quotes from Tyson and his brilliant cohort of science and entertainment luminaries, StarTalk will help answer all of your most pressing questions about our world—from how the brain works to the physics of comic book superheroes. Fun, smart, and laugh-out-loud funny, this book is the perfect guide to everything you ever wanted to know about the universe—and beyond.

**Cosmic Queries** MIT Press

New York Times Bestseller A luminous companion to the phenomenal bestseller *Astrophysics for People in a Hurry*. Astrophysicist Neil deGrasse Tyson has attracted one of the world's largest

online followings with his fascinating, widely accessible insights into science and our universe. Now, Tyson invites us to go behind the scenes of his public fame by revealing his correspondence with people across the globe who have sought him out in search of answers. In this hand-picked collection of 101 letters, Tyson draws upon cosmic perspectives to address a vast array of questions about science, faith, philosophy, life, and of course, Pluto. His succinct, opinionated, passionate, and often funny responses reflect his popularity and standing as a leading educator. Tyson's 2017 bestseller *Astrophysics for People in a Hurry* offered more than one million readers an insightful and accessible understanding of the universe. Tyson's most candid and heartfelt writing yet, *Letters from an Astrophysicist* introduces us to a newly personal dimension of Tyson's quest to explore our place in the cosmos.

*Origins* Nicholas Brealey

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.