The Quantum Story A History In 40 Moments Jim Baggott

How-- and how pervasively-- quantum mechanics has entered the general culture is the subject of this book, an engaging, eclectic, and thought-provoking look at the curious, boundlessly fertile intersection of scientific thought and everyday life.

The Quantum Thief is a Kirkus Reviews Best of 2011 Science Fiction & Fantasy title. One of Library Journal's Best SF/Fantasy Books of 2011 Jean le Flambeur is a post-human criminal, mind burglar, confidence artist, and trickster. His origins are shrouded in mystery, but his exploits are known throughout the Heterarchy- from breaking into the vast Zeusbrains of the Inner System to stealing rare Earth antiques from the aristocrats of Mars. Now he's confined inside the Dilemma Prison, where every day he has to get up and kill himself before his other self can kill him. Rescued by the mysterious Mieli and her flirtatious spacecraft, Jean is taken to the Oubliette, the Moving City of Mars, where time is currency, memories are treasures, and a moon-turnedsingularity lights the night. What Mieli offers is the chance to win back his freedom and the powers of his old self-in exchange for finishing the one heist he never quite managed. As Jean undertakes a series of capers on behalf of Mieli and her mysterious masters, elsewhere in the Oubliette investigator Isidore Beautrelet is called in to investigate the murder of a chocolatier, and finds himself on the trail of an arch-criminal, a man named le Flambeur.... Hannu Rajaniemi's The Quantum Thief is a

crazy joyride through the solar system several centuries hence, a world of marching cities, ubiquitous public-key encryption, people communicating by sharing memories, and a race of hyper-advanced humans who originated as MMORPG guild members. But for all its wonders, it is also a story powered by very human motives of betrayal, revenge, and jealousy. It is a stunning debut. At the Publisher's request, this title is being sold without Digital Rights Management Software (DRM) applied.

In The Quantum Universe, Brian Cox and Jeff Forshaw approach the world of quantum mechanics in the same way they did in Why Does E=mc2? and make fundamental scientific principles accessible—and fascinating—to everyone. The subatomic realm has a reputation for weirdness, spawning any number of profound misunderstandings, journeys into Eastern mysticism, and woolly pronouncements on the interconnectedness of all things. Cox and Forshaw’s contention? There is no need for quantum mechanics to be viewed this way. There is a lot of mileage in the “weirdness” of the quantum world, and it often leads to confusion and, frankly, bad science. The Quantum Universe cuts through the Wu Li and asks what observations of the natural world made it necessary, how it was constructed, and why we are confident that, for all its apparent strangeness, it is a good theory. The quantum mechanics of The Quantum Universe provide a concrete model of nature that is comparable in its essence to Newton’s laws of motion, Maxwell’s theory of electricity and magnetism, and Einstein’s theory of relativity.

The story of the unlikely friendship between the two physicists who fundamentally recast the notion of time and history In 1939, Richard Feynman, a brilliant graduate of MIT, arrived in John Wheeler's Princeton office to report for duty as his teaching assistant. A lifelong friendship and enormously productive collaboration was born, despite sharp differences in personality. The soft-spoken Wheeler, though conservative in appearance, was a raging nonconformist full of wild ideas about the universe. The boisterous Feynman was a cautious physicist who believed only what could be tested. Yet they were complementary spirits. Their collaboration led to a complete rethinking of the nature of time and reality. It enabled Feynman to show how quantum reality is a combination of alternative, contradictory possibilities, and inspired Wheeler to develop his landmark concept of wormholes, portals to the future and past. Together, Feynman and Wheeler made sure that quantum physics would never be the same again.

One of the world’s most beloved and bestselling writers takes his ultimate journey -- into the most intriguing and intractable questions that science seeks to answer. In A Walk in the Woods, Bill Bryson trekked the Appalachian Trail -- well, most of it. In In A Sunburned Country, he confronted some of the most lethal wildlife Australia has to offer. Now, in his biggest book, he confronts his greatest challenge: to understand -- and, if possible, answer -- the oldest, biggest questions we have posed about the universe and ourselves. Taking as territory everything from the Big Bang to the rise of civilization,

Bryson seeks to understand how we got from there being nothing at all to there being us. To that end, he has attached himself to a host of the world's most advanced (and often obsessed) archaeologists, anthropologists, and mathematicians, travelling to their offices, laboratories, and field camps. He has read (or tried to read) their books, pestered them with questions, apprenticed himself to their powerful minds. A Short History of Nearly Everything is the record of this quest, and it is a sometimes profound, sometimes funny, and always supremely clear and entertaining adventure in the realms of human knowledge, as only Bill Bryson can render it. Science has never been more involving or entertaining.

Mount Airy North Carolina was the birthplace of the late actor Andy Griffith and Historian Tom Perry. In this memoir of their hometown, Perry tells the story of the real Mayberry and his thoughts of the most famous son of the piedmont North Carolina town. This book is part memoir, part biography and part tour guide about Andy Griffith and Mount Airy, North Carolina. Beginning on the day Andy Griffith died, July 3, 2012, Perry tells about the town that day and goes back in time to bring Griffith and his own family to Mount Airy to work in the factories in the twentieth century. Sharing his connections with Griffith, Perry tells about the youth both shared in Mount Airy. The book then follows Andy Griffith to the University of North Carolina at Chapel Hill, Goldsboro to teach school and then Broadway, television and movies in a career that lasted decades. The book also details the effect of Andy Griffith on Mount Airy with the decades

long tourism boom that began in the 1980s with the town taking on the persona of the fictional Mayberry that Griffith obviously used to in his highly successful Andy Griffith Show that ran on CBS for eight years ending its run as the number one show on television.

Genghis Khan was the founder and Great Khan (emperor) of the Mongol Empire, which became the largest contiguous empire in history after his demise. He came to power by uniting many of the nomadic tribes of northeast Asia. After founding the Mongol Empire and being proclaimed "Genghis Khan," he started the Mongol invasions that resulted in the conquest of most of Eurasia. These included raids or invasions of the Kara-Khitan Khanate, Caucasus, Khwarezmid Empire, Western Xia and Jin dynasties. These campaigns were often accompanied by wholesale massacres of the civilian populations – especially in the Khwarezmian controlled lands. By the end of his life, the Mongol Empire occupied a substantial portion of Central Asia and China. Beyond his military accomplishments, Genghis Khan also advanced the Mongol Empire in other ways. He decreed the adoption of the Uyghur script as the Mongol Empire's writing system. He also promoted religious tolerance in the Mongol Empire, and created a unified empire from the nomadic tribes of northeast Asia. Present-day Mongolians regard him as the founding father of Mongolia. Genghis Khan is also credited with bringing the Silk Road under one cohesive political environment. This increased communication and trade from Northeast Asia to Muslim Southwest Asia and Christian Europe, thus expanding the horizons of all

three cultural areas. Historians have noted that Genghis Khan instituted meritocracy, and encouraged religious tolerance.

Physics is the fundamental branch of science that developed out of the study of nature and philosophy known, until around the end of the 19th century, as "natural philosophy." Today, physics is ultimately defined as the study of matter, energy and the relationships between them. Physics is, in some senses, the oldest and most basic pure science; its discoveries find applications throughout the natural sciences, since matter and energy are the basic constituents of the natural world. The other sciences are generally more limited in their scope and may be considered branches that have split off from physics to become sciences in their own right. Physics today may be divided loosely into classical physics and modern physics. Elements of what became physics were drawn primarily from the fields of astronomy, optics, and mechanics, which were methodologically united through the study of geometry. These mathematical disciplines began in antiquity with the Babylonians and with Hellenistic writers such as Archimedes and Ptolemy. Ancient philosophy, meanwhile - including what was called "physics" - focused on explaining nature through ideas such as Aristotle's four types of "cause."

'This is about gob-smacking science at the far end of reason ... Take it nice and easy and savour the experience of your mind being blown without recourse to hallucinogens' Nicholas Lezard, Guardian For most people, quantum theory is a byword for mysterious,

impenetrable science. And yet for many years it was equally baffling for scientists themselves. In this magisterial book, Manjit Kumar gives a dramatic and superbly-written history of this fundamental scientific revolution, and the divisive debate at its core. Quantum theory looks at the very building blocks of our world, the particles and processes without which it could not exist. Yet for 60 years most physicists believed that quantum theory denied the very existence of reality itself. In this tour de force of science history, Manjit Kumar shows how the golden age of physics ignited the greatest intellectual debate of the twentieth century. Quantum theory is weird. In 1905, Albert Einstein suggested that light was a particle, not a wave, defying a century of experiments. Werner Heisenberg's uncertainty principle and Erwin Schrodinger's famous dead-and-alive cat are similarly strange. As Niels Bohr said, if you weren't shocked by quantum theory, you didn't really understand it. While "Quantum" sets the science in the context of the great upheavals of the modern age, Kumar's centrepiece is the conflict between Einstein and Bohr over the nature of reality and the soul of science. 'Bohr brainwashed a whole generation of physicists into believing that the problem had been solved', lamented the Nobel Prize-winning physicist Murray Gell-Mann. But in "Quantum", Kumar brings Einstein back to the centre of the quantum debate. "Quantum" is the essential read for anyone fascinated by this complex and thrilling story and by the band of brilliant men at its heart.

This timeless exploration of the work of the great physicists of the early 20th century employs analogies,

examples, and imaginative insights rather than computations to explain the dramatic impact of quantum physics on classical theory. Topics include Pauli's exclusion principle, Schroedinger's wave equation, Heisenberg's uncertainty principle, and many other concepts. 1959 edition.

Utterly beautiful. Profoundly disconcerting. Quantum theory is quite simply the most successful account of the physical universe ever devised. Its concepts underpin much of the twenty-first century technology that we now take for granted. But at the same time it has completely undermined our ability to make sense of the world at its most fundamental level. Niels Bohr claimed that anybody who is not shocked by the theory has not understood it. The American physicist Richard Feynman went further: he claimed that nobody understands it. The Quantum Story begins in 1900, tracing a century of game-changing science. Popular science writer Jim Baggott first shows how, over the space of three decades, Einstein, Bohr, Heisenberg, and others formulated and refined the theory--and opened the floodgates. Indeed, since then, a torrent of ideas has flowed from the world's leading physicists, as they explore and apply the theory's bizarre implications. To take us from the story's beginning to the present day, Baggott organizes his narrative around forty turning-point moments of discovery. Many of these are inextricably bound up with the characters involved--their rivalries and their collaborations, their arguments and, not least, their excitement as they sense that they are redefining what reality means. Through the mix of story and science, we

experience their breathtaking leaps of theory and experiment, as they uncover such undreamed of and mind-boggling phenomenon as black holes, multiple universes, quantum entanglement, the Higgs boson, and much more. Brisk, clear, and compelling, The Quantum Story is science writing at its best. A compelling look at the one-hundred-year history of quantum theory, it illuminates the idea as it reveals how generations of physicists have grappled with this monster ever since.
Lucid, accessible introduction to the influential theory of energy and matter features careful explanations of Dirac's anti-particles, Bohr's model of the atom, and much more. Numerous drawings. 1966 edition.
Still today, it is hard for most of us to comprehend the paradoxical character of quantum theory. Its complex nature can nevertheless be broken down into the most important aspects and explained in an intelligible way. This book offers an easily understandable overview of its development and fundamental features and illustrates the origins of quantum theory as we know it today through the contributions of distinguished physicists and scientists over several centuries.
Describes how the early-20th-century discoveries in quantum physics found their way into today's modern language and collective culture, appearing in everything from television shows and movies to coffee mugs and T-shirts to art forms like sculpture and prose. 20,000 first printing.
Niels Bohr ranks with Einstein among the physicists of the 20th century. He rose to this status through his invention of the quantum theory of the atom and his

leadership in its defense and development. He also ranks with Einstein in his humanism and his sense of responsibility to his science and the society that enabled him to create it. Our book presents unpublished excerpts from extensive correspondence between Bohr and his immediate family, and uses it to describe and analyze the psychological and cultural background to his invention. The book also contains a reprinting of the three papers of 1913 - the Trilogy- in which Bohr worked out the provisional basis of a quantum theory of the atom.

A study of one of the fundamental concept of quantum physics examines the strange correlation between two separated particles, entitled "entanglement" by physicist John Bell, drawing on the work of leading physicists to explain the phenomenon.

An Account of the Peregrinations of an Ordinary Farm Family Following the Westward Movement from Virginia to Kansas with a Glimpse of Oklahoma Territory and Many Sides Trails Along the Way, Including Do's and Don't's of Writing a Family History.

The twentieth century was defined by physics. From the minds of the world's leading physicists there flowed a river of ideas that would transport mankind to the pinnacle of wonderment and to the very depths of human despair. This was a century that began with the certainties of absolute knowledge and ended with the knowledge of absolute uncertainty. It was a century in which physicists developed weapons with the capacity to destroy our reality, whilst at the same time denying us the possibility that we can ever properly comprehend it. Almost everything we think we know about the nature of our world comes from one theory of

physics. This theory was discovered and refined in the first thirty years of the twentieth century and went on to become quite simply the most successful theory of physics ever devised. Its concepts underpin much of the twenty-first century technology that we have learned to take for granted. But its success has come at a price, for it has at the same time completely undermined our ability to make sense of the world at the level of its most fundamental constituents. Rejecting the fundamental elements of uncertainty and chance implied by quantum theory, Albert Einstein once famously declared that 'God does not play dice'. Niels Bohr claimed that anybody who is not shocked by the theory has not understood it. The charismatic American physicist Richard Feynman went further: he claimed that nobody understands it. This is quantum theory, and this book tells its story. Jim Baggott presents a celebration of this wonderful yet wholly disconcerting theory, with a history told in forty episodes — significant moments of truth or turning points in the theory's development. From its birth in the porcelain furnaces used to study black body radiation in 1900, to the promise of stimulating new quantum phenomena to be revealed by CERN's Large Hadron Collider over a hundred years later, this is the extraordinary story of the quantum world. Oxford Landmark Science books are 'must-read' classics of modern science writing which have crystallized big ideas, and shaped the way we think.

"Seth examines the practical origins of much of the research undertaken by Arnold Sommerfeld at the University of Munich, some of which addressed problems carried over from his years of teaching at an engineering school"--OCLC

Most of us are unaware of how much we depend on quantum mechanics on a day-to-day basis. Using illustrations and examples from science fiction pulp magazines and comic books, The Amazing Story of Quantum Mechanics explains

the fundamental principles of quantum mechanics that underlie the world we live in. Watch a Video

The first edition of this award-winning book attracted a wide audience. This second edition is both a joy to read and a useful classroom tool. Unlike traditional textbooks, it requires no mathematical prerequisites and can be read around the mathematics presented. If used as a textbook, the mathematics can be prioritized, with a book both students and instructors will enjoy reading. Secret History: The Story of Cryptology, Second Edition incorporates new material concerning various eras in the long history of cryptology. Much has happened concerning the political aspects of cryptology since the first edition appeared. The still unfolding story is updated here. The first edition of this book contained chapters devoted to the cracking of German and Japanese systems during World War II. Now the other side of this cipher war is also told, that is, how the United States was able to come up with systems that were never broken. The text is in two parts. Part I presents classic cryptology from ancient times through World War II. Part II examines modern computer cryptology. With numerous real-world examples and extensive references, the author skillfully balances the history with mathematical details, providing readers with a sound foundation in this dynamic field. FEATURES Presents a chronological development of key concepts Includes the Vigenère cipher, the one-time pad, transposition ciphers, Jefferson's wheel cipher, Playfair cipher, ADFGX, matrix encryption, Enigma, Purple, and other classic methods Looks at the work of Claude Shannon, the origin of the National Security Agency, elliptic curve cryptography, the Data Encryption Standard, the Advanced Encryption Standard, public-key cryptography, and many other topics New chapters detail SIGABA and SIGSALY, successful systems used during World War II for text and speech, respectively Includes

quantum cryptography and the impact of quantum computers
Everything around us is made of 'stuff', from planets, to books, to our own bodies. Whatever it is, we call it matter or material substance. It is solid; it has mass. But what is matter, exactly? We are taught in school that matter is not continuous, but discrete. As a few of the philosophers of ancient Greece once speculated, nearly two and a half thousand years ago, matter comes in 'lumps', and science has relentlessly peeled away successive layers of matter to reveal its ultimate constituents. Surely, we can't keep doing this indefinitely. We imagine that we should eventually run up against some kind of ultimately fundamental, indivisible type of stuff, the building blocks from which everything in the Universe is made. The English physicist Paul Dirac called this 'the dream of philosophers'. But science has discovered that the foundations of our Universe are not as solid or as certain and dependable as we might have once imagined. They are instead built from ghosts and phantoms, of a peculiar quantum kind. And, at some point on this exciting journey of scientific discovery, we lost our grip on the reassuringly familiar concept of mass. How did this happen? How did the answers to our questions become so complicated and so difficult to comprehend? In Mass Jim Baggott explains how we come to find ourselves here, confronted by a very different understanding of the nature of matter, the origin of mass, and its implications for our understanding of the material world. Ranging from the Greek philosophers Leucippus and Democritus, and their theories of atoms and void, to the development of quantum field theory and the discovery of a Higgs boson-like particle, he explores our changing understanding of the nature of matter, and the fundamental related concept of mass.
Internationally renowned, award-winning theoretical physicist, New York Times bestselling author of A Universe from

Nothing, and passionate advocate for reason, Lawrence Krauss tells the dramatic story of the discovery of the hidden world of reality—a grand poetic vision of nature—and how we find our place within it. In the beginning there was light. But more than this, there was gravity. After that, all hell broke loose… In A Universe from Nothing, Krauss revealed how our entire universe could arise from nothing. Now, he reveals what that something—reality—is. And, reality is not what we think or sense—it's weird, wild, and counterintuitive; it's hidden beneath everyday experience; and its inner workings seem even stranger than the idea that something can come from nothing. In a landmark, unprecedented work of scientific history, Krauss leads us to the furthest reaches of space and time, to scales so small they are invisible to microscopes, to the birth and rebirth of light, and into the natural forces that govern our existence. His unique blend of rigorous research and engaging storytelling invites us into the lives and minds of the remarkable, creative scientists who have helped to unravel the unexpected fabric of reality—with reason rather than superstition and dogma. Krauss has himself been an active participant in this effort, and he knows many of them well. The Greatest Story challenges us to re-envision ourselves and our place within the universe, as it appears that "God" does play dice with the universe. In the incisive style of his scintillating essays for The New Yorker, Krauss celebrates the greatest intellectual adventure ever undertaken—to understand why we are here in a universe where fact is stranger than fiction.

"Physicists have grappled with quantum theory for over a century. They have learned to wring precise answers from the theory's governing equations, and no experiment to date has found compelling evidence to contradict it. Even so, the conceptual apparatus remains stubbornly, famously bizarre. Physicists have tackled these conceptual uncertainties while

navigating still larger ones: the rise of fascism, cataclysmic world wars and a new nuclear age, an unsteady Cold War stand-off and its unexpected end. Quantum Legacies introduces readers to physics' still-unfolding quest by treating iconic moments of discovery and debate among well-known figures like Albert Einstein, Erwin Schrödinger, and Stephen Hawking, and many others whose contributions have indelibly shaped our understanding of nature"--

Erwin Schrödinger was an Austrian physicist famous for his contribution to quantum physics. He won the Nobel Prize in 1933 and is best known for his thought experiment of a cat in a box, both alive and dead at the same time, which revealed the seemingly paradoxical nature of quantum mechanics. Schrödinger was working at one of the most fertile and creative moments in the whole history of science. By the time he started university in 1906, Einstein had already published his revolutionary papers on relativity. Now the baton of scientific progress was being passed to a new generation: Werner Heisenberg, Paul Dirac, Niels Bohr, and of course, Schrödinger himself. In this riveting biography John Gribbin takes us into the heart of the quantum revolution. He tells the story of Schrödinger's surprisingly colourful life (he arrived for a position at Oxford University with both his wife and mistress). And with his trademark accessible style and popular touch, he explains the fascinating world of quantum mechanics, which underpins all of modern science.

This is an exceptionally accessible, accurate, and non-technical introduction to quantum mechanics. After briefly summarizing the differences between classical and quantum behaviour, this engaging account

considers the Stern-Gerlach experiment and its implications, treats the concepts of probability, and then discusses the Einstein-Podolsky-Rosen paradox and Bell's theorem. Quantal interference and the concept of amplitudes are introduced and the link revealed between probabilities and the interference of amplitudes. Quantal amplitude is employed to describe interference effects. Final chapters explore exciting new developments in quantum computation and cryptography, discover the unexpected behaviour of a quantal bouncing-ball, and tackle the challenge of describing a particle with no position. Thought-provoking problems and suggestions for further reading are included. Suitable for use as a course text, The Strange World of Quantum Mechanics enables students to develop a genuine understanding of the domain of the very small. It will also appeal to general readers seeking intellectual adventure.

The untold story of the heretical thinkers who dared to question the nature of our quantum universe Every physicist agrees quantum mechanics is among humanity's finest scientific achievements. But ask what it means, and the result will be a brawl. For a century, most physicists have followed Niels Bohr's Copenhagen interpretation and dismissed questions about the reality underlying quantum physics as meaningless. A mishmash of solipsism and poor reasoning, Copenhagen endured, as Bohr's students vigorously protected his legacy, and the physics community favored practical experiments over philosophical arguments. As a result, questioning the status quo long meant professional ruin. And yet, from the 1920s to today, physicists like John

Bell, David Bohm, and Hugh Everett persisted in seeking the true meaning of quantum mechanics. What Is Real? is the gripping story of this battle of ideas and the courageous scientists who dared to stand up for truth.
Quantum Theory, together with the principles of special and general relativity, constitute a scientific revolution that has profoundly influenced the way in which we think about the universe and the fundamental forces that govern it. The Historical Development of Quantum Theory is a definitive historical study of that scientific work and the human struggles that accompanied it from the beginning. Drawing upon such materials as the resources of the Archives for the History of Quantum Physics, the Niels Bohr Archives, and the archives and scientific correspondence of the principal quantum physicists, as well as Jagdish Mehra's personal discussions over many years with most of the architects of quantum theory, the authors have written a rigorous scientific history of quantum theory in a deeply human context. This multivolume work presents a rich account of an intellectual triumph: a unique analysis of the creative scientific process. The Historical Development of Quantum Theory is science, history, and biography, all wrapped in the story of a great human enterprise. Its lessons will be an aid to those working in the sciences and humanities alike.
After the end of the Civil War, former rivals, John Demsond and Jason Alexander, team up to help Jason's father, John T. Alexander, a.k.a. the Cattle King, bring thousands of longhorn cattle out of Texas to feed the hungry people in Chicago and New York. Demsond finds

himself embroiled in a web of conflicts and killings that threaten to constrict the entire nation's recovery. Mysterious deaths, likened to those of an earlier plague that ravaged Europe, destroy friendships and fortunes, and the country slips into the devastating Panic of 1873. A tantalizing blend of fact and fiction, J.D. Proffitt's second novel is a sequel to his first story titled "Manchester Bluff: A Civil War Novel." Both books unveil elements of the past, long ago forgotten, but relevant today. J.D. Proffitt is an assistant professor at Illinois College in Jacksonville, Illinois - his second career following many years in cellular telephone engineering management. He was raised in the small town of Alexander, Illinois, a location that plays a prominent role in his second novel. For more information about J.D. Proffitt, go to www.jdproffittbooks.com.

In this inspiring coming-of-age memoir, a world-renowned astrophysicist emerges from an impoverished childhood and crime-filled adolescence to ascend through the top ranks of research physics. “You’ll encounter one extraordinary turn of events after another, as the extraordinary chess player, puzzle solver, and occasional grifter works his way from grinding poverty and deep despair to worldwide acclaim as a physicist.”—Bill Nye, CEO of The Planetary Society Navigating poverty, violence, and instability, a young James Plummer had two guiding stars—a genius IQ and a love of science. But a bookish nerd is a soft target, and James faced years of bullying and abuse. As he struggled to survive his childhood in some of the country’s toughest urban neighborhoods in New

Orleans, Houston, and LA, and later in the equally poor backwoods of Mississippi, he adopted the persona of “gangsta nerd”—dealing weed in juke joints while winning state science fairs with computer programs that model Einstein’s theory of relativity. Once admitted to the elite physics PhD program at Stanford University, James found himself pulled between the promise of a bright future and a dangerous crack cocaine habit he developed in college. With the encouragement of his mentor and the sole Black professor in the physics department, James confronted his personal demons as well as the entrenched racism and classism of the scientific establishment. When he finally seized his dream of a life in astrophysics, he adopted a new name, Hakeem Muata Oluseyi, to honor his African ancestors. Alternately heartbreaking and hopeful, A Quantum Life narrates one man’s remarkable quest across an ever-expanding universe filled with entanglement and choice.

The Quantum StoryA History in 40 MomentsOxford University Press

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

Theoretical physics is in trouble. At least that's the impression you'd get from reading a spate of recent books on the continued failure to resolve the 80-year-old problem of unifying the classical and quantum worlds. The seeds of this problem were sewn eighty years ago when a dramatic revolution in physics reached a climax at the 1927 Solvay conference in Brussels. It's the story of a rush to formalize quantum physics, the work of just a handful of men fired by ambition, philosophical conflicts and personal agendas. Sheilla Jones paints an intimate portrait of the ten key figures who wrestled with the mysteries of the new science of the quantum, along with a powerful supporting cast of famous (and not so famous) colleagues. The Brussels conference was the first time so many of the "quantum ten" had been in the same place: Albert Einstein, the lone wolf; Niels Bohr, the obsessive but gentlemanly father figure; Max Born, the anxious hypochondriac; Werner Heisenberg, the intensely ambitious one; Wolfgang Pauli, the sharp-tongued critic with a dark side; Paul Dirac, the silent Englishman; Erwin Schrödinger, the enthusiastic womanizer; Prince Louis de Broglie, the French aristocrat; Pascual Jordan, the ardent Aryan nationalist,

who was not invited; and Paul Ehrenfest, who was witness to it all. This is the story of quantum physics that has never been told, an equation-free investigation into the turbulent development of the new science and its very fallible creators, including little-known details of the personal relationship between the deeply troubled Ehrenfest and his dear friend Albert Einstein. Jones weaves together the personal and the scientific in a heartwarming—and heartbreaking—story of the men who struggled to create quantum physics ... a story of passion, tragedy, ambition and science.

Einstein and the Quantum reveals for the first time the full significance of Albert Einstein's contributions to quantum theory. Einstein famously rejected quantum mechanics, observing that God does not play dice. But, in fact, he thought more about the nature of atoms, molecules, and the emission and absorption of light--the core of what we now know as quantum theory--than he did about relativity. A compelling blend of physics, biography, and the history of science, Einstein and the Quantum shares the untold story of how Einstein--not Max Planck or Niels Bohr--was the driving force behind early quantum theory. It paints a vivid portrait of the iconic physicist as he grappled with the apparently contradictory nature of the atomic world, in which its invisible constituents defy the categories of classical physics, behaving simultaneously as both particle and wave. And it demonstrates how Einstein's later work on the emission and absorption of light, and on atomic gases, led directly to Erwin Schrödinger's breakthrough to the modern form of quantum mechanics. The book

sheds light on why Einstein ultimately renounced his own brilliant work on quantum theory, due to his deep belief in science as something objective and eternal.

Written by a Twice Exceptional (Gifted & Dyslexic) 8 year old, this book is NOT a children's book, but is intended for high school, college or adults wanting an approachable overview to Quantum Physics.

One of TIME's Ten Best Nonfiction Books of the Decade "Meet the new Stephen Hawking . . . The Order of Time is a dazzling book." --The Sunday Times From the bestselling author of Seven Brief Lessons on Physics, comes a concise, elegant exploration of time. Why do we remember the past and not the future? What does it mean for time to "flow"? Do we exist in time or does time exist in us? In lyric, accessible prose, Carlo Rovelli invites us to consider questions about the nature of time that continue to puzzle physicists and philosophers alike. For most readers this is unfamiliar terrain. We all experience time, but the more scientists learn about it, the more mysterious it remains. We think of it as uniform and universal, moving steadily from past to future, measured by clocks. Rovelli tears down these assumptions one by one, revealing a strange universe where at the most fundamental level time disappears. He explains how the theory of quantum gravity attempts to understand and give meaning to the resulting extreme landscape of this timeless world. Weaving together ideas from philosophy, science and literature, he suggests that our perception of the flow of time depends on our perspective, better understood starting from the structure of our brain and emotions than from the physical

universe. Already a bestseller in Italy, and written with the poetic vitality that made Seven Brief Lessons on Physics so appealing, The Order of Time offers a profoundly intelligent, culturally rich, novel appreciation of the mysteries of time.

At the end of the nineteenth century, some physicists believed that the basic principles underlying their subject were already known, and that physics in the future would only consist of filling in the details. They could hardly have been more wrong. The past century has seen the rise of quantum mechanics, relativity, cosmology, particle physics, and solid-state physics, among other fields. These subjects have fundamentally changed our understanding of space, time, and matter. They have also transformed daily life, inspiring a technological revolution that has included the development of radio, television, lasers, nuclear power, and computers. In Quantum Generations, Helge Kragh, one of the world's leading historians of physics, presents a sweeping account of these extraordinary achievements of the past one hundred years. The first comprehensive one-volume history of twentieth-century physics, the book takes us from the discovery of X rays in the mid-1890s to superstring theory in the 1990s. Unlike most previous histories of physics, written either from a scientific perspective or from a social and institutional perspective, Quantum Generations combines both approaches. Kragh writes about pure science with the expertise of a trained physicist, while keeping the content accessible to nonspecialists and paying careful attention to practical uses of science, ranging from compact disks to bombs.

As a historian, Kragh skillfully outlines the social and economic contexts that have shaped the field in the twentieth century. He writes, for example, about the impact of the two world wars, the fate of physics under Hitler, Mussolini, and Stalin, the role of military research, the emerging leadership of the United States, and the backlash against science that began in the 1960s. He also shows how the revolutionary discoveries of scientists ranging from Einstein, Planck, and Bohr to Stephen Hawking have been built on the great traditions of earlier centuries. Combining a mastery of detail with a sure sense of the broad contours of historical change, Kragh has written a fitting tribute to the scientists who have played such a decisive role in the making of the modern world.