A Cultural History Of Physics

Aided by personal documents and institutional archives that were closed for decades, this book recounts the development of physics—or, more aptly, science under stress—in Soviet Russia up to World War II. Focusing on Leningrad, center of Soviet physics until the late 1930s, Josephson discusses the impact of scientific, cultural, and political revolution on physicists' research and professional aspirations. Political and social revolution in Russia threatened to confound the scientific revolution. Physicists eager to investigate new concepts of space, energy, light, and motion were forced to accommodate dialectical materialism and subordinate their interests to those of the state. They ultimately faced Stalinist purges and the shift of physics leadership to Moscow. This account of scientists cut off from their Western colleagues reveals a little-known part of the history of modern physics.

As recently as two hundred years ago, physics as we know it today did not exist. Born in the early nineteenth century during the second scientific revolution, physics struggled at first to achieve legitimacy in the scientific community and culture at large. In fact, the term "physicist" did not appear in English until the 1830s. When Physics Became King traces the emergence of this revolutionary science, demonstrating how a discipline that barely existed in 1800 came to be regarded a century later as the ultimate key to unlocking nature's secrets. A cultural history designed to provide a big-picture view, the book ably ties advances in the field to the efforts of physicists who worked to win social acceptance for their research. Beginning his tale with the rise of physics from natural philosophy, Iwan Morus chronicles the emergence of mathematical physics in France and its later export to England and Germany. He then elucidates the links between physics and industrialism, the technology of statistical mechanics, and the establishment of astronomical laboratories and precision measurement tools. His tale ends on the eve of the First World War, when physics had firmly established itself in both science and society. Scholars of both history and physics will enjoy this fascinating and studied look at the emergence of a major scientific discipline.

Charting innovative directions in the environmental humanities, this book examines the cultural history of climate change under three broad headings: history, writing and politics. Climate change compels us to rethink many of our traditional means of historical understanding, and demands new ways of relating human knowledge, action and representations to the dimensions of geological and evolutionary time. To address these challenges, this book positions our present moment of climatic knowledge within much longer histories of climatic experience. Only in light of these histories, it argues, can we properly understand what climate means today across an array of discursive domains, from politics, literature and law to neighbourly conversation. Its chapters identify turning-points and experiments in the construction of climates and of atmospheres of sensation. They examine how contemporary ecological thought has repoliticised the representation of nature and detail vital aspects of the history and prehistory of our climatic modernity. This ground-breaking text will be of great interest to researchers and postgraduate students in environmental history, environmental governance, history of ideas and science, literature and eco-criticism, political theory, cultural theory, as well as all general readers interested in climate change.

big history and the future of humanity “This remains the best single attempt to theorize big history as a discipline that can link core concepts and paradigms across all historical disciplines, from cosmology to geology, from biology to human history. With additional and updated material, the Second Edition also offers a fine introduction to the history of big history and a superb introductory survey to the big history story. Essential reading for anyone interested in a rapidly evolving new field of scholarship that links the sciences and the humanities into a

modern, science-based origin story." David Christian, Macquarie University "Notable for its theoretic approach, this new Second Edition is both an indispensable contribution to the emerging big history narrative and a powerful university textbook. Spier defines words carefully and recognizes the limits of current knowledge, aspects of his own clear thinking." Cynthia Brown, Emerita, Dominican University of California Reflecting the latest theories in the sciences and humanities, this new edition of Big History and the Future of Humanity presents an accessible and original overview of the entire sweep of history from the origins of the universe and life on Earth up to the present day. Placing the relatively brief period of human history within a much broader framework – one that considers everything from vast galaxy clusters to the tiniest sub-atomic particles – big history is an innovative theoretical approach that opens up entirely new multidisciplinary research agendas. Noted historian Fred Spier reveals how a thorough examination of patterns of complexity can offer richer insights into what the future may have in store for humanity. The second edition includes new learning features, such as highlighted scientific concepts, an illustrative timeline and comprehensive glossary. By exploring the cumulative history from the Big Bang to the modern day, Big History and the Future of Humanity, Second Edition, sheds important historical light on where we have been – and offers a tantalizing glimpse of what lies ahead. Originally published in 2015 as: Physics: a short history from quintessence to quarks.

The first book of its kind to provide a full and comprehensive historical grounding of the contemporary issues of gender and women in science. Women in Science includes a detailed survey of the history behind the popular subject and engages the reader with a theoretical and informed understanding with significant issues like science and race, gender and technology and masculinity. It moves beyond the historical work on women and science by avoiding focusing on individual women scientists.

The phenomenal Sunday Times bestseller Periodic Tales by Hugh Andersey-Williams, packed with fascinating stories and unexpected information about the building blocks of our universe. Everything in the universe is made of them, including you. Like you, the elements have personalities, attitudes, talents, shortcomings, stories rich with meaning. Here you'll meet iron that rains from the heavens and noble gases that light the way to vice. You'll learn how lead can tell your future while zinc may one day line your coffin. You'll discover what connects the bones in your body with the Whitehouse in Washington, the glow of a streetlamp with the salt on your dinner table. Unlocking their astonishing secrets and colourful pasts, Periodic Tales is a voyage of wonder and discovery, showing that their stories are our stories, and their lives are inextricable from our own. 'Science writing at its best. A fascinating and beautiful literary anthology, bringing them to life as personalities. If only chemistry had been like this at school. A rich compilation of delicious tales'Matt Ridley, Prospect 'A love letter to the chemical elements. Aldersey-Williams is full of good stories and he knows how to tell them well'Sunday Telegraph 'Great fun to read and an endless fund of unlikely and improbable anecdotes'Financial Times 'The history, science, art, literature and everyday applications of all the elements from aluminium to zinc' The Times Hugh Aldersey-Williams studied natural sciences at Cambridge. He is the author of several books exploring science, design and architecture and has curated exhibitions at the Victoria and Albert Museum and the Wellcome Collection. He lives in Norfolk with his wife and son.

This monograph offers a cultural history of the development of physics in India during the first half of the twentieth century, focusing on Indian physicists Satyendranath Bose (1894-1974), Chandrasekhara Venkata Raman (1888-1970) and Meghnad Saha (1893-1956). The analytical category "bhadralok physics" is introduced to explore how it became possible for a highly successful brand of modern science to develop in a country that was still under colonial domination. The term Bhadralok refers to the then emerging group of native intelligentsia, who were identified by academic pursuits and manners. Exploring the forms of life of this social group allows a better understanding of the specific

character of Indian modernity that, as exemplified by the work of bhadralok physicists, combined modern science with indigenous knowledge in an original program of scientific research. The three scientists achieved the most significant scientific successes in the new revolutionary field of quantum physics, with such internationally recognized accomplishments as the Saha ionization equation (1921), the famous Bose-Einstein statistics (1924), and the Raman Effect (1928), the latter discovery having led to the first ever Nobel Prize awarded to a scientist from Asia. This book analyzes the responses by Indian scientists to the radical concept of the light quantum, and their further development of this approach outside the purview of European authorities. The outlook of bhadralok physicists is characterized here as "cosmopolitan nationalism," which allows us to analyze how the group pursued modern science in conjunction with, and as an instrument of Indian national liberation.

The importance of science and technology and future of education and research are just some of the subjects discussed here.

Michel Serres is one of the most influential living theorists in European philosophy. This volume makes available a work which has a foundational place in the development of chaos theory, representing a tour de force application of the principles underlying Serres' distinctive philosophy of science.

This pioneering work is the first to trace how our understanding of the causes of human behavior has changed radically over the course of European and American cultural history since 1830. Focusing on the act of murder, as documented vividly by more than a hundred novels including Crime and Punishment, An American Tragedy, The Trial, and Lolita, Stephen Kern devotes each chapter of A Cultural History of Causality to examining a specific causal factor or motive for murder--ancestry, childhood, language, sexuality, emotion, mind, society, and ideology. In addition to drawing on particular novels, each chapter considers the sciences (genetics, endocrinology, physiology, neuroscience) and systems of thought (psychoanalysis, linguistics, sociology, forensic psychiatry, and existential philosophy) most germane to each causal factor or motive. Kern identifies five shifts in thinking about causality, shifts toward increasing specificity, multiplicity, complexity, probability, and uncertainty. He argues that the more researchers learned about the causes of human behavior, the more they realized how much more there was to know and how little they knew about what they thought they knew. The book closes by considering the revolutionary impact of quantum theory, which, though it influenced novelists only marginally, shattered the model of causal understanding that had dominated Western thought since the seventeenth century. Others have addressed changing ideas about causality in specific areas, but no one has tackled a broad cultural history of this concept as does Stephen Kern in this engagingly written and lucidly argued book.

The Routledge Companion to Cultural History in the Western World is a comprehensive examination of recent discussions and findings in the exciting field of cultural history. A synthesis of how the new cultural history has transformed the study of history, the volume is divided into three parts – medieval, early modern and modern – that emphasize the way people made sense of the world around them. Contributions cover such themes as material cultures of living, mobility and transport, cultural exchange and transfer, power and conflict, emotion and communication, and the history of the senses. The focus is on the Western world, but the notion of the West is a flexible one. In bringing together 36 authors from 15 countries, the book takes a wide geographical coverage, devoting continuous attention to global connections and the emerging trend of globalization. It builds a panorama of the transformation of Western identities, and the critical ramifications of that evolution from the Middle Ages to the twenty-first century, that offers the reader a wide-ranging illustration of the potentials of cultural history as a way of studying the past in a variety of times, spaces and aspects of human experience. Engaging with historiographical debate and covering a vast range of themes, periods and places, The Routledge Companion to Cultural History in the Western World is the ideal

resource for cultural history students and scholars to understand and advance this dynamic field.

While the physical sciences are a continuously evolving source of technology and of understanding about our world, they have become so specialized and rely on so much prerequisite knowledge that for many people today the divide between the sciences and the humanities seems even greater than it was when C. P. Snow delivered his famous 1959 lecture, "The Two Cultures." In A Cultural History of Physics, Hungarian scientist and educator Károly Simonyi succeeds in bridging this chasm by describing the experimental methods and theoretical interpretations that created scientific knowledge, from ancient times to the present day, within the cultural environment in which it was formed. Unlike any other work of its kind, Simonyi's seminal opus explores the interplay of science and the humanities to convey the wonder and excitement of scientific development throughout the ages. These pages contain an abundance of excerpts from original resources, a wide array of clear and straightforward explanations, and an astonishing wealth of insight, revealing the historical progress of science and inviting readers into a dialogue with the great scientific minds that shaped our current understanding of physics. Beautifully illustrated, accurate in its scientific content and broad in its historical and cultural perspective, this book will be a valuable reference for scholars and an inspiration to aspiring scientists and humanists who believe that science is an integral part of our culture.

A breakout bestseller in Italy, now available for American readers for the first time, Genesis: The Story of How Everything Began is a short, humanistic tour of the origins of the universe, earth, and life—drawing on the latest discoveries in physics to explain the seven most significant moments in the creation of the cosmos. Curiosity and wonderment about the origins of the universe are at the heart of our experience of the world. From Hesiod's Chaos, described in his poem about the origins of the Greek gods, Theogony, to today's mind-bending theories of the multiverse, humans have been consumed by the relentless pursuit of an answer to one awe inspiring question: What exactly happened during those first moments? Guido Tonelli, the acclaimed, award-winning particle physicist and a central figure in the discovery of the Higgs boson (the "God particle"), reveals the extraordinary story of our genesis—from the origins of the universe, to the emergence of life on Earth, to the birth of human language with its power to describe the world. Evoking the seven days of biblical creation, Tonelli takes us on a brisk, lively tour through the evolution of our cosmos and considers the incredible challenges scientists face in exploring its mysteries. Genesis both explains the fundamental physics of our universe and marvels at the profound wonder of our existence.

Imagine, if you can, the world in the year 2100. In Physics of the Future, Michio Kaku—the New York Times bestselling author of Physics of the Impossible—gives us a stunning, provocative, and exhilarating vision of the coming century based on interviews with over three hundred of the world's top scientists who are already inventing the future in their labs. The result is the most authoritative and scientifically accurate description of the revolutionary developments taking place in medicine, computers, artificial intelligence, nanotechnology, energy production, and astronautics. In all likelihood, by 2100 we will control computers via tiny brain sensors and, like magicians, move objects around with the power of our minds. Artificial intelligence will be dispersed throughout the environment, and Internet-enabled contact lenses will allow us to access the world's information base or conjure up any image we desire in the blink of an eye. Meanwhile, cars will drive themselves using GPS, and if room-temperature superconductors are discovered, vehicles will effortlessly fly on a cushion of air, coasting on powerful magnetic fields and ushering in the age of magnetism. Using molecular medicine, scientists will be able to grow almost every organ of the body and cure genetic diseases. Millions of tiny DNA sensors and nanoparticles patrolling our blood cells will silently scan our bodies for the first sign of illness, while rapid advances in genetic research will enable us to slow down or maybe even reverse the aging process, allowing human life spans to increase dramatically. In space, radically new ships—needle-sized vessels using laser propulsion—could replace the expensive

chemical rockets of today and perhaps visit nearby stars. Advances in nanotechnology may lead to the fabled space elevator, which would propel humans hundreds of miles above the earth’s atmosphere at the push of a button. But these astonishing revelations are only the tip of the iceberg. Kaku also discusses emotional robots, antimatter rockets, X-ray vision, and the ability to create new life-forms, and he considers the development of the world economy. He addresses the key questions: Who are the winner and losers of the future? Who will have jobs, and which nations will prosper? All the while, Kaku illuminates the rigorous scientific principles, examining the rate at which certain technologies are likely to mature, how far they can advance, and what their ultimate limitations and hazards are. Synthesizing a vast amount of information to construct an exciting look at the years leading up to 2100, Physics of the Future is a thrilling, wondrous ride through the next 100 years of breathtaking scientific revolution.

Our understanding of nature, and in particular of physics and the laws governing it, has changed radically since the days of the ancient Greek natural philosophers. This book explains how and why these changes occurred, through landmark experiments as well as theories that - for their time - were revolutionary. The presentation covers Mechanics, Optics, Electromagnetism, Thermodynamics, Relativity Theory, Atomic Physics and Quantum Physics. The book places emphasis on ideas and on a qualitative presentation, rather than on mathematics and equations. Thus, although primarily addressed to those who are studying or have studied science, it can also be read by non-specialists. The author concludes with a discussion of the evolution and organization of universities, from ancient times until today, and of the organization and dissemination of knowledge through scientific publications and conferences.

The most fatal virus known to science, rabies-a disease that spreads avidly from animals to humans-kills nearly one hundred percent of its victims once the infection takes root in the brain. In this critically acclaimed exploration, journalist Bill Wasik and veterinarian Monica Murphy chart four thousand years of the history, science, and cultural mythology of rabies. From Greek myths to zombie flicks, from the laboratory heroics of Louis Pasteur to the contemporary search for a lifesaving treatment, Rabid is a fresh and often wildly entertaining look at one of humankind's oldest and most fearsome foes. "A searing narrative." -The New York Times "In this keen and exceptionally well-written book, rife with surprises, narrative suspense and a steady flow of expansive insights, 'the world's most diabolical virus' conquers the unsuspecting reader's imaginative nervous system. . . . A smart, unsettling, and strangely stirring piece of work." -San Francisco Chronicle "Fascinating. . . . Wasik and Murphy chronicle more than two millennia of myths and discoveries about rabies and the animals that transmit it, including dogs, bats and raccoons." -The Wall Street Journal

Here is the essential guide to physics, an authoritative reference book and timeline that examines the foundations upon which all scientific knowledge rests. Without physics, everything else -- from astronomy to zoology -- would be a meaningless conjecture. Our journey begins with the first attempts to understand reality, Mother Nature -- or as the ancient Greeks called it, physics. Follow the journey through history as great scientists, such as Thales, Galileo, Feynman, and many others, gradually unpick the fabric of the Universe, revealing an array of fundamental forces, intangible particles, and indestructible energy. Today, physics discoveries make headline news as we confirm the fresh mysteries of the Higgs boson, supersymmetry, and dark energy.

A spirited look at the relationship between physics and religion--and the implications for both sexes.

Traditional accounts of the energy concept have tended to emphasize its discovery, an inevitable product of the progress of science in the 19th century. This new history places the construction of the concept firmly in its social context.

Each of these essays struggles in one way or another with the necessity of facing up to the discovery that the laws of nature are impersonal,

with no hint of a special status for human beings. Defending the spirit of science against its cultural adversaries, these essays express a viewpoint that is reductionist, realist, and devoutly secular. Together, they afford the general reader the unique pleasure of experiencing the superb sense, understanding, and knowledge of one of the most interesting and forceful scientific minds of our era.ease fill in marketing copy
This richly illustrated book explores the fascinating and ubiquitous occurrence of spirals and vortices in human culture and in nature. Spiral forms have been used as elements in the arts for thousands of years, whereas their role in nature and science – from DNA and sea shells to galaxies – is still a topic of investigation in numerous fields. Following an introduction to the cultural history of spiral forms, the book presents contributions from leading experts, who describe the origins, mechanisms and dynamics of spirals and vortices in their special fields. As a whole the book provides a valuable source of information, while also taking the reader on an aesthetic and scientific journey through the world of spiral forms.
This classic introductory text features hundreds of applications and design problems that illuminate fundamentals of trusses, loaded beams and cables, and related areas. Includes 334 answered problems.
Human societies have not always taken on new technology in appropriate ways. Innovations are double-edged swords that transform relationships among people, as well as between human societies and the natural world. Only through successful cultural appropriation can we manage to control the hubris that is fundamental to the innovative, enterprising human spirit; and only by becoming hybrids, combining the human and the technological, will we be able to make effective use of our scientific and technological achievements. This broad cultural history of technology and science provides a range of stories and reflections about the past, discussing areas such as film, industrial design, and alternative environmental technologies, and including not only European and North American, but also Asian examples, to help resolve the contradictions of contemporary high-tech civilization.
In Physicists Look Back: Studies in the History of Physics, various international contributors ranging from physicists, engineers, theoreticians, experimentalists, and information scientists to educationalists, science historians, sociologists, and physics teachers discuss the history of physics. They describe their own research developments, demonstrate ways the history of physics can be helpful in teaching physics and in clearing up difficult concepts, and offer professional advice about resources and methods. This diversified book provides a historical background to modern physics and illustrates how an appreciation of the historical context of physics can lead to a better understanding of modern physics. It covers the history of ozone, the ionosphere, plasma physics, the technical developments of the electron microscope and crystallographic x-ray photography, and the history of the Josephson effect. Well illustrated and containing some autobiographical research not previously published, this resource is valuable reading for professional physicists, physics teachers, educationalists, historians and philosophers of science, and physicists.
While the physical sciences are a continuously evolving source of technology and of understanding about our world, they have become so specialized and rely on so much prerequisite knowledge that for many people today the divide between the sciences and the humanities seems even greater than it was when C.P. Snow delivered his famous 1959 lecture, "The Two Cultures." In this work, the author, a Hungarian scientist and educator succeeds in bridging this chasm by describing the experimental methods and theoretical interpretations that created scientific knowledge, from ancient times to the present day, within the cultural environment in which it was formed. It explores the interplay of science and the humanities to convey the wonder and excitement of scientific development throughout the ages. This book contains excerpts from original resources, explanations, and insight, revealing the historical progress of science and inviting readers into a

dialogue with the great scientific minds that shaped our current understanding of physics.

If offered the chance—by cloak, spell, or superpower—to be invisible, who wouldn't want to give it a try? We are drawn to the idea of stealthy voyeurism and the ability to conceal our own acts, but as desirable as it may seem, invisibility is also dangerous. It is not just an optical phenomenon, but a condition full of ethical questions. As esteemed science writer Philip Ball reveals in this book, the story of invisibility is not so much a matter of how it might be achieved but of why we want it and what we would do with it. In this lively look at a timeless idea, Ball provides the first comprehensive history of our fascination with the unseen. This sweeping narrative moves from medieval spell books to the latest nanotechnology, from fairy tales to telecommunications, from camouflage to ghosts to the dawn of nuclear physics and the discovery of dark energy. Along the way, Invisible tells little-known stories about medieval priests who blamed their misdeeds on spirits; the Cock Lane ghost, which intrigued both Samuel Johnson and Charles Dickens; the attempts by Victorian scientist William Crookes to detect forces using tiny windmills; novelist Edward Bulwer-Lytton's belief that he was unseen when in his dressing gown; and military efforts to enlist magicians to hide tanks and ships during WWII. Bringing in such voices as Plato and Shakespeare, Ball provides not only a scientific history but a cultural one—showing how our simultaneous desire for and suspicion of the invisible has fueled invention and the imagination for centuries. In this unusual and clever book, Ball shows that our fantasies about being unseen—and seeing the unseen—reveal surprising truths about who we are.

The past 20 years have witnessed a turn towards the sensuous, particularly the aural, as a viable space for critical exploration in History and other Humanities disciplines. This has been informed by a heightened awareness of the role that the senses play in shaping modern identity and understanding of place; and increasingly, how the senses are central to the memory of past experiences and their representation. The result has been a broadening of our historical imagination, which has previously taken the visual for granted and ignored the other senses. Considering how crucial the auditory aspect of life has been, a shift from seeing to hearing past societies offers a further perspective for examining the complexity of historical events and experiences. Historians in many fields have begun to listen to the past, developing new arguments about the history and the memory of sensory experience. This volume builds on scholarship produced over the last twenty years and explores these dimensions by coupling the history of sound and the senses in distinctive ways: through a study of the sound of violence; the sound of voice mediated by technologies and the expression of memory through the senses. Though sound is the most developed field in the study of the sensorium, many argue that each of the senses should not be studied in isolation from each other, and for this reason, the final section incorporates material which emphasizes the sense as relational.

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.

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.

To understand modern science, it is essential to recognize that many of the most fundamental scientific principles are drawn from the knowledge of ancient civilizations. Taking a global yet comprehensive approach to this complex topic, A History of Science in World Cultures uses a broad range of case studies and examples to demonstrate that the scientific thought and method of the present day is deeply rooted in a pluricultural past. Covering ancient Egypt, Mesopotamia, India, Greece, China, Islam, and the New World, this volume discusses the scope of scientific and technological achievements in each civilization and how the knowledge it developed came to impact the European Renaissance. Themes covered include the influence these scientific cultures had upon one another, the power of writing and its technologies, visions of mathematical order in the universe and how it can be represented, and what elements of the distant scientific past we continue to depend upon today. Topics often left unexamined in histories of science are treated in fascinating detail, such as the chemistry of mummification and the Great Library in Alexandria in Egypt, jewellery and urban planning of the Indus Valley, hydraulic engineering and the compass in China, the sustainable agriculture and dental surgery of the Mayas, and algebra and optics in Islam. This book shows that scientific thought has never been confined to any one era, culture, or geographic region. Clearly presented and highly illustrated, A History of Science in World Cultures is the perfect text for all students and others interested in the development of science throughout history.

The birth of science in ancient Greece had a historical impact that is still being felt today. Physicist Demetris Nicolaides examines the epochal shift in thinking that led pre-Socratic philosophers of the sixth and fifth centuries BCE to abandon the prevailing mythologies of the age and, for the first time, to analyze the natural world in terms of impersonal, rationally understood principles. He argues not only that their conceptual breakthroughs anticipated much of later science but that scientists of the twenty-first century are still grappling with the fundamental problems raised twenty-five hundred years ago. Looking at the vast sweep of human history, the author delves into the factors that led to the birth of science- urbanization, the role of religion, and in Greece a progressive intellectual curiosity that was unafraid to question tradition. Why did

the first scientific approach to understanding the world take place in Greece? The author makes a convincing case that, aside from factors of geography and politics, the power of the Greek language and a cultural proclivity for critical thinking played a large role. In the Light of Scienceis a unique approach to the history of science revealing the important links between the ancient past and the present scientific endeavor to understand the universe.

A Cultural History of PhysicsCRC Press

One of Smithsonian's Favorite Books of 2018 One of Forbes's 2018 Best Books About Astronomy, Physics and Mathematics One of Kirkus's Best Books of 2018 The intellectual adventure story of the "double-slit" experiment, showing how a sunbeam split into two paths first challenged our understanding of light and then the nature of reality itself--and continues to almost 200 years later. Many of science's greatest minds have grappled with the simple yet elusive "double-slit" experiment. Thomas Young devised it in the early 1800s to show that light behaves like a wave, and in doing so opposed Isaac Newton. Nearly a century later, Albert Einstein showed that light comes in quanta, or particles, and the experiment became key to a fierce debate between Einstein and Niels Bohr over the nature of reality. Richard Feynman held that the double slit embodies the central mystery of the quantum world. Decade after decade, hypothesis after hypothesis, scientists have returned to this ingenious experiment to help them answer deeper and deeper questions about the fabric of the universe. How can a single particle behave both like a particle and a wave? Does a particle exist before we look at it, or does the very act of looking create reality? Are there hidden aspects to reality missing from the orthodox view of quantum physics? Is there a place where the quantum world ends and the familiar classical world of our daily lives begins, and if so, can we find it? And if there's no such place, then does the universe split into two each time a particle goes through the double slit? With his extraordinarily gifted eloquence, Anil Ananthaswamy travels around the world and through history, down to the smallest scales of physical reality we have yet fathomed. Through Two Doors at Once is the most fantastic voyage you can take.

Traces the life of a Jewish physicist who had to flee Nazi Germany, codiscovered nuclear fission with Otto Hahn and Fritz Strassmann, but was denied recognition when the work received a Nobel Prize

Presents a history of physics, examining the theories and experimental practices of the science.

Historical surveys consider Judeo-Christian notions of space, Newtonian absolute space, perceptions from 18th century to the present, more. Numerous quotations and references. "Admirably compact and swiftly paced style." — Philosophy of Science.

Widely regarded as a classic in its field, Constructing Quarks recounts the history of the post-war conceptual development of elementary-particle physics. Inviting a reappraisal of the status of scientific knowledge, Andrew Pickering

suggests that scientists are not mere passive observers and reporters of nature. Rather they are social beings as well as active constructors of natural phenomena who engage in both experimental and theoretical practice. "A prodigious piece of scholarship that I can heartily recommend."—Michael Riordan, New Scientist "An admirable history. . . . Detailed and so accurate."—Hugh N. Pendleton, Physics Today

Leviathan and the Air-Pump examines the conflicts over the value and propriety of experimental methods between two major seventeenth-century thinkers: Thomas Hobbes, author of the political treatise Leviathan and vehement critic of systematic experimentation in natural philosophy, and Robert Boyle, mechanical philosopher and owner of the newly invented air-pump. The issues at stake in their disputes ranged from the physical integrity of the air-pump to the intellectual integrity of the knowledge it might yield. Both Boyle and Hobbes were looking for ways of establishing knowledge that did not decay into ad hominem attacks and political division. Boyle proposed the experiment as cure. He argued that facts should be manufactured by machines like the air-pump so that gentlemen could witness the experiments and produce knowledge that everyone agreed on. Hobbes, by contrast, looked for natural law and viewed experiments as the artificial, unreliable products of an exclusive guild. The new approaches taken in Leviathan and the Air-Pump have been enormously influential on historical studies of science. Shapin and Schaffer found a moment of scientific revolution and showed how key scientific givens--facts, interpretations, experiment, truth--were fundamental to a new political order. Shapin and Schaffer were also innovative in their ethnographic approach. Attempting to understand the work habits, rituals, and social structures of a remote, unfamiliar group, they argued that politics were tied up in what scientists did, rather than what they said. Steven Shapin and Simon Schaffer use the confrontation between Hobbes and Boyle as a way of understanding what was at stake in the early history of scientific experimentation. They describe the protagonists' divergent views of natural knowledge, and situate the Hobbes-Boyle disputes within contemporary debates over the role of intellectuals in public life and the problems of social order and assent in Restoration England. In a new introduction, the authors describe how science and its social context were understood when this book was first published, and how the study of the history of science has changed since then.

Holograms have been in the public eye for over a half-century, but their influences have deeper cultural roots. No other visual experience is quite like interacting with holograms; no other cultural product melds the technological sublime with magic and optimism in quite the same way. As holograms have evolved, they have left their audiences alternately fascinated, bemused, inspired or indifferent. From expressions of high science to countercultural art to consumer security, holograms have represented modernity, magic and materialism. Their most pervasive impact has been to galvanise hopeful technological dreams. Engineers, artists, hippies and hobbyists have played with, and dreamed about,

holograms. This book explores how holograms found a place in distinct cultural settings. It is aimed at readers attracted to pop culture, visual studies and cultural history, scholars concerned with media history, fine art and material studies and, most of all, cross-disciplinary audiences intrigued about how this ubiquitous but still-mysterious visual medium grew up in our midst and became entangled in our culture. This book explores the technical attractions and cultural uses of the hologram, how they were shaped by what came before them, and how they have matured to shape our notional futures. Today, holograms are in our pockets (as identity documents) and in our minds (as gaming fantasies and 'faux hologram' performers). Why aren't they more often in front of our eyes?