

A Journey Springer

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[Extra Dimensions in Space and Time](#) - Itzhak Bars 2008-11-01

In physics, the idea of extra spatial dimensions originates from Nordstöm's 5-dimensional vector theory in 1914, followed by Kaluza-Klein theory in 1921, in an effort to unify general relativity and electromagnetism in a 5 dimensional space-time (4 dimensions for space and 1 for time). Kaluza-Klein theory didn't generate enough interest with physicist for the next five decades, due to its problems with inconsistencies. With the advent of supergravity theory (the theory that unifies general relativity and supersymmetry theories) in late 1970's and eventually, string theories (1980s) and M-theory (1990s), the dimensions of space-time increased to 11 (10-space and 1-time dimension). There are two main features in this book that differentiates it from other books written about extra dimensions: The first feature is the coverage of extra dimensions in time (Two Time physics), which has not been covered in earlier books about extra dimensions. All other books mainly cover extra spatial dimensions. The second feature deals with level of presentation. The material is presented in a non-technical language followed by additional sections (in the form of appendices or footnotes) that explain the basic equations and formulas in the theories. This feature is very attractive to readers who want to find out more about the theories involved beyond the basic description for a layperson. The text is designed for scientifically literate non-specialists who want to know the latest discoveries in theoretical physics in a non-technical language. Readers with basic undergraduate background in modern physics and quantum mechanics can easily understand the technical sections. Part I starts with an overview of the Standard Model of particles and forces, notions of Einstein's special and general relativity, and the overall view of the universe from the Big Bang to the present epoch, and covers Two-Time physics. 2T-physics has worked correctly at all scales of physics, both macroscopic and microscopic, for which there is experimental data so far. In addition to revealing hidden information even in familiar "everyday" physics, it also makes testable predictions in lesser known physics regimes that could be analyzed at the energy scales of the Large Hadron Collider at CERN or in cosmological observations." Part II of the book is focused on extra dimensions of space. It covers the following topics: The Popular View of Extra Dimensions, Einstein and the Fourth Dimension, Traditional Extra Dimensions, Einstein's Gravity, The Theory Formerly Known as String, Warped Extra Dimensions, and How Do We Look For Extra Dimensions?

[A Mathematical Journey to Quantum Mechanics](#) - Salvatore Capozziello 2021-09-27

This book provides an itinerary to quantum mechanics taking into account the basic mathematics to formulate it. Specifically, it features the main experiments and postulates of quantum mechanics pointing out their mathematical prominent aspects showing how physical concepts and mathematical tools are deeply intertwined. The material covers topics such as analytic mechanics in Newtonian, Lagrangian, and Hamiltonian formulations, theory of light as formulated in special relativity, and then why quantum mechanics is necessary to explain experiments like the double-split, atomic spectra, and photoelectric effect. The Schrödinger equation and its solutions are developed in detail. It is pointed out that, starting from the concept of the harmonic oscillator, it is possible to develop advanced quantum mechanics. Furthermore, the mathematics behind the Heisenberg uncertainty principle is constructed towards advanced quantum mechanical principles. Relativistic quantum mechanics is finally considered. The book is devoted to undergraduate students from University courses of Physics, Mathematics, Chemistry, and Engineering. It consists of 50 self-contained lectures, and any statement and theorem are demonstrated in detail. It is the companion book of "A Mathematical Journey to Relativity", by the same Authors, published by Springer in 2020. *Countdown to a Moon Launch* - Jonathan H. Ward 2015-07-07
Thousands of workers labored at Kennedy Space Center around the

clock, seven days a week, for half a year to prepare a mission for the liftoff of Apollo 11. This is the story of what went on during those hectic six months. Countdown to a Moon Launch provides an in-depth look at the carefully choreographed workflow for an Apollo mission at KSC. Using the Apollo 11 mission as an example, readers will learn what went on day by day to transform partially completed stages and crates of parts into a ready-to-fly Saturn V. Firsthand accounts of launch pad accidents, near misses, suspected sabotage, and last-minute changes to hardware are told by more than 70 NASA employees and its contractors. A companion to Rocket Ranch, it includes many diagrams and photographs, some never before published, to illustrate all aspects of the process. NASA's groundbreaking use of computers for testing and advanced management techniques are also covered in detail. This book will demystify the question of how NASA could build and launch Apollo missions using 1960s technology. You'll discover that there was no magic involved - just an abundance of discipline, willpower, and creativity.

[How to Follow Jesus](#) - Craig Springer 2020-02-18

Millions of people want to follow Jesus, but don't know how. Upon becoming Christians, new believers often end up paralyzed. They become overwhelmed trying to master complicated doctrines, frustrated by a large list of rules for policing their lives, and bewildered by a new (and strange) vocabulary. Even worse, there are few books offering simple and clear advice to guide a Christian's first spiritual steps that are written in common, contemporary language. Until now. In *How to Follow Jesus*, Craig Springer, executive director of Alpha USA, one of America's most effective evangelism movements, explodes numerous myths surrounding the Christian faith that create unnecessary obstacles to growth, including: illustrating that sin and temptation are not the greatest threat to a flourishing faith, forgiveness means going through rather than around our feelings, and how disappointment in the church may be the essential step in growing a foundation for life-changing community. Sharing personal stories from his own journey to a mature faith, Springer sets readers at ease and offers them practical, easy-to-implement advice for following Jesus. Destined to become a timeless classic, *How to Follow Jesus* is a must read for new and returning Christians.

[How Apollo Flew to the Moon](#) - W. David Woods 2011-08-08

Stung by the pioneering space successes of the Soviet Union - in particular, Gagarin being the first man in space, the United States gathered the best of its engineers and set itself the goal of reaching the Moon within a decade. In an expanding 2nd edition of *How Apollo Flew to the Moon*, David Woods tells the exciting story of how the resulting Apollo flights were conducted by following a virtual flight to the Moon and its exploration of the surface. From launch to splashdown, he hitches a ride in the incredible spaceships that took men to another world, exploring each step of the journey and detailing the enormous range of disciplines, techniques, and procedures the Apollo crews had to master. While describing the tremendous technological accomplishment involved, he adds the human dimension by calling on the testimony of the people who were there at the time. He provides a wealth of fascinating and accessible material: the role of the powerful Saturn V, the reasoning behind trajectories, the day-to-day concerns of human and spacecraft health between two worlds, the exploration of the lunar surface and the sheer daring involved in traveling to the Moon and the mid-twentieth century. Given the tremendous success of the original edition of *How Apollo Flew to the Moon*, the second edition will have a new chapter on surface activities, inspired by reader's comment on Amazon.com. There will also be additional detail in the existing chapters to incorporate all the feedback from the original edition, and will include larger illustrations.

[Spring Time](#) - Steve Springer 2016-11-20

[Misconceptions](#) - Naomi Wolf 2003-05-20

In *Misconceptions*, bestselling author Naomi Wolf she demythologizes motherhood and reveals the dangers of common assumptions about childbirth. With uncompromising honesty she describes how hormones eroded her sense of independence, ultrasounds tested her commitment to abortion rights, and the keepers of the OB/GYN establishment lacked compassion. The weeks after her first daughter's birth taught her how society, employers, and even husbands can manipulate new mothers. She had bewildering post partum depression, but learned that a surprisingly high percentage of women experience it. Wolf's courageous willingness to talk about the unexpected difficulties of childbirth will help every woman become a more knowledgeable planner of her pregnancy and better prepare her for the challenges of balancing a career, freedom, and a growing family. Invaluable in its advice to parents, *Misconceptions* speaks to anyone connected—personally, medically, or professionally—to a new mother.

A Journey Through Representation Theory - Caroline Gruson
2018-10-23

This text covers a variety of topics in representation theory and is intended for graduate students and more advanced researchers who are interested in the field. The book begins with classical representation theory of finite groups over complex numbers and ends with results on representation theory of quivers. The text includes in particular infinite-dimensional unitary representations for abelian groups, Heisenberg groups and $SL(2)$, and representation theory of finite-dimensional algebras. The last chapter is devoted to some applications of quivers, including Harish-Chandra modules for $SL(2)$. Ample examples are provided and some are revisited with a different approach when new methods are introduced, leading to deeper results. Exercises are spread throughout each chapter. Prerequisites include an advanced course in linear algebra that covers Jordan normal forms and tensor products as well as basic results on groups and rings.

Climate, Planetary and Evolutionary Sciences - Guido Visconti
2021-04-14

This book presents the result of an innovative challenge, to create a systematic literature overview driven by machine-generated content. Questions and related keywords were prepared for the machine to query, discover, collate and structure by Artificial Intelligence (AI) clustering. The AI-based approach seemed especially suitable to provide an innovative perspective as the topics are indeed both complex, interdisciplinary and multidisciplinary, for example, climate, planetary and evolution sciences. Springer Nature has published much on these topics in its journals over the years, so the challenge was for the machine to identify the most relevant content and present it in a structured way that the reader would find useful. The automatically generated literature summaries in this book are intended as a springboard to further discoverability. They are particularly useful to readers with limited time, looking to learn more about the subject quickly and especially if they are new to the topics. Springer Nature seeks to support anyone who needs a fast and effective start in their content discovery journey, from the undergraduate student exploring interdisciplinary content, to Master- or PhD-thesis developing research questions, to the practitioner seeking support materials, this book can serve as an inspiration, to name a few examples. It is important to us as a publisher to make the advances in technology easily accessible to our authors and find new ways of AI-based author services that allow human-machine interaction to generate readable, usable, collated, research content.

Cosmic Update - Fred Adams 2011-11-16

"...The Multiversal book series is equally unique, providing book-length extensions of the lectures with enough additional depth for those who truly want to explore these fields, while also providing the kind of clarity that is appropriate for interested lay people to grasp the general principles involved." - Lawrence M. Krauss *Cosmic Update* Covers: A novel approach to uncover the dark faces of the Standard Model of cosmology. The possibility that Dark Energy and Dark Matter are manifestations of the inhomogeneous geometry of our Universe. On the history of cosmological model building and the general architecture of cosmological modes. Illustrations on the Large Scale Structure of the Universe. A new perspective on the classical static Einstein Cosmos. Global properties of World Models including their Topology. The Arrow of Time in a Universe with a Positive Cosmological Constant. Exploring the consequences of a fundamental Cosmological Constant for our Universe. Exploring why the current observed acceleration of the Universe may not be its final destiny. Demonstrating that nature forbids the existence of a pure Cosmological Constant. Our current understanding of the long term (in time scales that greatly exceed the

current age of the Universe) future of the Universe. The long term fate and eventual destruction of the astrophysical objects that populate the universe -- including clusters, galaxies, stars, planets, and black holes. The material is presented in a layperson-friendly language followed by additional technical sections that explain the basic equations and principles. This feature is very attractive to readers who want to learn more about the theories involved beyond the basic description.

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Data Journeys in the Sciences - Sabina Leonelli 2020-06-29

This groundbreaking, open access volume analyses and compares data practices across several fields through the analysis of specific cases of data journeys. It brings together leading scholars in the philosophy, history and social studies of science to achieve two goals: tracking the travel of data across different spaces, times and domains of research practice; and documenting how such journeys affect the use of data as evidence and the knowledge being produced. The volume captures the opportunities, challenges and concerns involved in making data move from the sites in which they are originally produced to sites where they can be integrated with other data, analysed and re-used for a variety of purposes. The in-depth study of data journeys provides the necessary ground to examine disciplinary, geographical and historical differences and similarities in data management, processing and interpretation, thus identifying the key conditions of possibility for the widespread data sharing associated with Big and Open Data. The chapters are ordered in sections that broadly correspond to different stages of the journeys of data, from their generation to the legitimisation of their use for specific purposes. Additionally, the preface to the volume provides a variety of alternative "roadmaps" aimed to serve the different interests and entry points of readers; and the introduction provides a substantive overview of what data journeys can teach about the methods and epistemology of research.

From Big Data to Smart Data - Fernando Iafate 2015-02-26

A pragmatic approach to Big Data by taking the reader on a journey between Big Data (what it is) and the Smart Data (what it is for). Today's decision making can be reached via information (related to the data), knowledge (related to people and processes), and timing (the capacity to decide, act and react at the right time). The huge increase in volume of data traffic, and its format (unstructured data such as blogs, logs, and video) generated by the "digitalization" of our world modifies radically our relationship to the space (in motion) and time, dimension and by capillarity, the enterprise vision of performance monitoring and optimization.

Relativity: A Journey Through Warped Space and Time - Daniel R. Mayerson 2019-11-22

This primer brilliantly exposes concepts related to special and general relativity for the absolute beginner. It can be used either as an introduction to the subject at a high school level or as a useful compass for undergraduates who want to move the first steps towards Einstein's theories. The book is enhanced throughout with many useful exercises and beautiful illustrations to aid understanding. The topics covered include: Lorentz transformations, length contraction and time dilation, the twin paradox (and other paradoxes), Minkowski spacetime, the Einstein equivalence principle, curvature of space and spacetime, geodesics, parallel transport, Einstein's equations of general relativity, black holes, wormholes, cosmology, gravitational waves, time machines, and much more.

Stratospheric Flight - Andras Sóbester 2011-06-28

In this book, Dr. Andras Sobester reviews the science behind high altitude flight. He takes the reader on a journey that begins with the complex physiological questions involved in taking humans into the "death zone." How does the body react to falling ambient pressure? Why is hypoxia (oxygen deficiency associated with low air pressure) so dangerous and why is it so difficult to 'design out' of aircraft, why does it still cause fatalities in the 21st century? What cabin pressures are air passengers and military pilots exposed to and why is the choice of an appropriate range of values such a difficult problem? How do high altitude life support systems work and what happens if they fail? What happens if cabin pressure is lost suddenly or, even worse, slowly and unnoticed? The second part of the book tackles the aeronautical problems of flying in the upper atmosphere. What loads does stratospheric flight place on pressurized cabins at high altitude and why are these difficult to predict? What determines the maximum altitude an aircraft can climb to? What is the 'coffin corner' and how can it be avoided? The history of aviation has seen a handful of airplanes reach

altitudes in excess of 70,000 feet - what are the extreme engineering challenges of climbing into the upper stratosphere? Flying high makes very high speeds possible -- what are the practical limits? The key advantage of stratospheric flight is that the aircraft will be 'above the weather' - but is this always the case? Part three of the book investigates the extreme atmospheric conditions that may be encountered in the upper atmosphere. How high can a storm cell reach and what is it like to fly into one? How frequent is high altitude 'clear air' turbulence, what causes it and what are its effects on aircraft? The stratosphere can be extremely cold - how cold does it have to be before flight becomes unsafe? What happens when an aircraft encounters volcanic ash at high altitude? Very high winds can be encountered at the lower boundary of the stratosphere - what effect do they have on aviation? Finally, part four looks at the extreme limits of stratospheric flight. How high will a winged aircraft will ever be able to fly? What are the ultimate altitude limits of ballooning? What is the greatest altitude that you could still bail out from? And finally, what are the challenges of exploring the stratospheres of other planets and moons? The author discusses these and many other questions, the known knowns, the known unknowns and the potential unknown unknowns of stratospheric flight through a series of notable moments of the recent history of mankind's forays into the upper atmospheres, each of these incidents, accidents or great triumphs illustrating a key aspect of what makes stratospheric flight aviation at the limit.

A Journey in Antarctica - Sergio Rossi 2022-02-22

Having always been fascinated by these singular landscapes, Sergio Rossi reconstructs some of the episodes that have marked the exploration of these territories, such as the dramatic race between Amundsen and Scott to conquer the South Pole, and Captain Shackleton's odyssey to save his crew from certain death. But also modern trips including his own to these remote areas, explaining many aspects of the current science and political competition that is underway. The book leads us on an entertaining overview of all the problems and opportunities that the planet's most forgotten continent offers to humans. A remote mass of ice upon which our future as a species depends and which we cannot continue to ignore any longer.

The A-Z of the PhD Trajectory - Eva O. L. Lantsoght 2018-05-25

This textbook is a guide to success during the PhD trajectory. The first part of this book takes the reader through all steps of the PhD trajectory, and the second part contains a unique glossary of terms and explanation relevant for PhD candidates. Written in the accessible language of the PhD Talk blogs, the book contains a great deal of practical advice for carrying out research, and presenting one's work. It includes tips and advice from current and former PhD candidates, thus representing a broad range of opinions. The book includes exercises that help PhD candidates get their work kick-started. It covers all steps of a doctoral journey in STEM: getting started in a program, planning the work, the literature review, the research question, experimental work, writing, presenting, online tools, presenting at one's first conference, writing the first journal paper, writing and defending the thesis, and the career after the PhD. Since a PhD trajectory is a deeply personal journey, this book suggests methods PhD candidates can try out, and teaches them how to figure out for themselves which proposed methods work for them, and how to find their own way of doing things.

The Journey to Inclusion - Xuan Thuy Nguyen 2015-12-22

This book offers insight on the politics of inclusion in Vietnam through a Foucauldian and post-colonial perspective on disability and education. Drawing on a socio-historical analysis of the inclusion of disabled people in Vietnam in the twenty-first century, the book guides readers through a 'history of the present.' By reflecting on the treatment of disabled people in Vietnamese social history, the book argues that this journey to inclusion calls for critical reflections on the challenges and possibilities for policies to transform exclusion for disabled people. The book unveils the problematics of social and educational institutions in governing disability and difference through a critical reflection on discourses and power in the global and local juncture, in relation to its engagement with disability in the global South. The intersection between the global politics of disability rights and development and the local politics of inclusion in Vietnam shapes the cultural politics of education. The ways inclusive education is historically constructed, within this socio-historical condition, reflects the challenges of inclusive thought and action for transforming injustice. Going beyond 'deconstructive politics,' The Journey to Inclusion argues for a re-positioning of the relationships between the global North and South as an alternative approach to inclusion. It suggests that critical research must construct a politics of

engagement with subjugated voices and representations in transnational, national, and local contexts. A reflexive, critical, and inclusive dialogue that engages with Southern knowledge offers a political platform for reframing justice in the twenty-first century.

Biological Antenna to the Humanoid Bot - Pushpendra Singh 2022-02-01
The book outlines a pathway to the development of fusion of electromagnetic resonance and artificial intelligence which will dominate the world of communication engineering. Electromagnetic resonance is fundamental to all biomaterials. The authors explore the peculiarities of this typical resonance behaviour in the literatures and provide the key points where the research should direct. Biological antennas are inspiring designing of several electromagnetic devices. From biomimetic engineering to humanoid bots a revolution is undergoing. Authors include entire development in the form of a book along with their contribution to this field.

Nurses Making Policy - Rebecca Patton 2014-11-13

Print+CourseSmart

HCV: The Journey from Discovery to a Cure - Michael J. Sofia 2019-11-23
Hepatitis C is a liver disease caused by the hepatitis C virus (HCV) and infects approximately 75 million individuals worldwide. It is also one of the major causes of liver cancer and liver transplants. The elucidation of the HCV genome, and the development of a whole cell system to study the virus spurred the search for novel direct acting antiviral drugs to cure this disease. This global effort culminated in the development of direct acting antiviral drugs that led to cure rates approaching 100% in all patient populations after only 8-12 weeks of therapy. These efforts resulted in one of the greatest achievements in public health and provides the potential for eliminating HCV as a major disease worldwide. This volume is aimed at a broad audience of academic and industrial scientists interested in the discovery and development of drugs to treat viral diseases and those interested in reading about one of the most unique accomplishments in biomedical research. The volume will provide a one of a kind reference work that highlights the many efforts, from the discovery of the HCV virus, to the invention of breakthrough medicines and their use in the real world to cure patients. It is the companion book to the volume "HCV: The Journey from Discovery to a Cure - Volume II".

A Journey Through The Realm of Numbers - Menny Aka 2020-10-03

This book takes the reader on a journey from familiar high school mathematics to undergraduate algebra and number theory. The journey starts with the basic idea that new number systems arise from solving different equations, leading to (abstract) algebra. Along this journey, the reader will be exposed to important ideas of mathematics, and will learn a little about how mathematics is really done. Starting at an elementary level, the book gradually eases the reader into the complexities of higher mathematics; in particular, the formal structure of mathematical writing (definitions, theorems and proofs) is introduced in simple terms. The book covers a range of topics, from the very foundations (numbers, set theory) to basic abstract algebra (groups, rings, fields), driven throughout by the need to understand concrete equations and problems, such as determining which numbers are sums of squares. Some topics usually reserved for a more advanced audience, such as Eisenstein integers or quadratic reciprocity, are lucidly presented in an accessible way. The book also introduces the reader to open source software for computations, to enhance understanding of the material and nurture basic programming skills. For the more adventurous, a number of Outlooks included in the text offer a glimpse of possible mathematical excursions. This book supports readers in transition from high school to university mathematics, and will also benefit university students keen to explore the beginnings of algebraic number theory. It can be read either on its own or as a supporting text for first courses in algebra or number theory, and can also be used for a topics course on Diophantine equations.

A Journey Through Discrete Mathematics - Martin Loebbl 2017-10-11

This collection of high-quality articles in the field of combinatorics, geometry, algebraic topology and theoretical computer science is a tribute to Jiří Matoušek, who passed away prematurely in March 2015. It is a collaborative effort by his colleagues and friends, who have paid particular attention to clarity of exposition - something Jirka would have approved of. The original research articles, surveys and expository articles, written by leading experts in their respective fields, map Jiří Matoušek's numerous areas of mathematical interest.

Principles and Pedagogies in Jewish Education - Barry Chazan 2021

This book is aimed at Improving contemporary educational practice by rooting it in clear analytical thinking. The book utilizes the analytic approach to philosophy of education to elucidate the meaning of the

terms: education; moral education; indoctrination contemporary American Jewish education; informal Jewish education, the Israel experience; and Israel education. The final chapter of the book presents an educators credo for 21st-century Jewish education and general education. Barry Chazan is Professor Emeritus of the Hebrew University of Jerusalem and Research Professor at the George Washington University Graduate School of Education and Human Development.

Partnership in Space - Ben Evans 2013-10-04

April 12, 2011 was the 50th Anniversary of Yuri Gagarin's pioneering journey into space. To commemorate this momentous achievement, Springer-Praxis has produced a mini-series of books that reveals how humanity's knowledge of flying, working, and living in space has grown in the last half century. "Partners in Space" focuses on the early to late 1990s, a time in the post-Soviet era when relations between East and West steadily - though not without difficulty - thawed and the foundations of real harmony and genuine co-operation were laid for the first time with Shuttle-Mir and the International Space Station. This book explores the events which preceded that new era, including the political demise of Space Station Freedom and the consequences of the fall of the Soviet Union on a once-proud human space program. It traces the history of "the Partnership" through the often traumatic times of Shuttle-Mir and closes on the eve of the launch of Zarya, the first component of today's International Space Station.

A Journey of Embedded and Cyber-Physical Systems - Jian-Jia Chen 2020-07-30

This Open Access book celebrates Professor Peter Marwedel's outstanding achievements in compilers, embedded systems, and cyber-physical systems. The contributions in the book summarize the content of invited lectures given at the workshop "Embedded Systems" held at the Technical University Dortmund in early July 2019 in honor of Professor Marwedel's seventieth birthday. Provides a comprehensive view from leading researchers with respect to the past, present, and future of the design of embedded and cyber-physical systems; Discusses challenges and (potential) solutions from theoreticians and practitioners on modeling, design, analysis, and optimization for embedded and cyber-physical systems; Includes coverage of model verification, communication, software runtime systems, operating systems and real-time computing.

Verne's Journey to the Centre of the Self - William Butcher 1990-07-09

Computational Neuroscience - Hanspeter A Mallot 2013-05-23

Computational Neuroscience - A First Course provides an essential introduction to computational neuroscience and equips readers with a fundamental understanding of modeling the nervous system at the membrane, cellular, and network level. The book, which grew out of a lecture series held regularly for more than ten years to graduate students in neuroscience with backgrounds in biology, psychology and medicine, takes its readers on a journey through three fundamental domains of computational neuroscience: membrane biophysics, systems theory and artificial neural networks. The required mathematical concepts are kept as intuitive and simple as possible throughout the book, making it fully accessible to readers who are less familiar with mathematics. Overall, Computational Neuroscience - A First Course represents an essential reference guide for all neuroscientists who use computational methods in their daily work, as well as for any theoretical scientist approaching the field of computational neuroscience.

A Journey in Mathematics Education Research - Erna Yackel 2010-11-30

Our objective is to publish a book that lays out the theoretical constructs and research methodologies within mathematics education that have been developed by Paul Cobb and explains the process of their development. We propose to do so by including papers in which Cobb introduced new theoretical perspectives and methodologies into the literature, each preceded by a substantive accompanying introductory paper that explains the motivation/rationale for developing the new perspectives and/or methodologies and the processes through which they were developed, and Cobb's own retrospective comments. In this way the book provides the reader with heretofore unpublished material that lays out in considerable detail the issues and problems that Cobb has confronted in his work, that, from his viewpoint, required theoretical and methodological shifts/advances and provides insight into how he has achieved the shifts/advances. The result will be a volume that, in addition to explaining Cobb's contributions to the field of mathematics education, also provides the reader with insight into what is involved in developing

an aggressive and evolving research program. When Cobb confronts problems and issues in his work that cannot be addressed using his existing theories and frameworks, he looks to other fields for theoretical inspiration. A critical feature of Cobb's work is that in doing so, he consciously appropriates and adapts ideas from these other fields to the purpose of supporting processes of learning and teaching mathematics; He does not simply accept the goals or motives of those fields. As a result, Cobb reconceptualizes and reframes issues and concepts so that they result in new ways of investigating, exploring, and explaining phenomena that he encounters in the practical dimensions of his work, which include working in classrooms, with teachers, and with school systems. The effect is that the field of mathematics education is altered. Other researchers have found his "new ways of looking" useful to them. And they, in turn, adapt these ideas for their own use. The complexity of many of the ideas that Cobb has introduced into the field of mathematics education can lead to a multiplicity of interpretations by practitioners and by other researchers, based on their own experiential backgrounds. Therefore, by detailing the development of Cobb's work, including the tensions involved in coming to grips with and reconciling apparently contrasting perspectives, the book will shed additional light on the processes of reconceptualization and thus help the reader to understand the reasons, mechanisms, and outcomes of researchers' constant pursuit of new insights.

A Mathematical Journey to Relativity - Wladimir-Georges Boskoff 2020-06-01

This book opens with an axiomatic description of Euclidean and non-Euclidean geometries. Euclidean geometry is the starting point to understand all other geometries and it is the cornerstone for our basic intuition of vector spaces. The generalization to non-Euclidean geometry is the following step to develop the language of Special and General Relativity. These theories are discussed starting from a full geometric point of view. Differential geometry is presented in the simplest way and it is applied to describe the physical world. The final result of this construction is deriving the Einstein field equations for gravitation and spacetime dynamics. Possible solutions, and their physical implications are also discussed: the Schwarzschild metric, the relativistic trajectory of planets, the deflection of light, the black holes, the cosmological solutions like de Sitter, Friedmann-Lemaître-Robertson-Walker, and Gödel ones. Some current problems like dark energy are also sketched. The book is self-contained and includes details of all proofs. It provides solutions or tips to solve problems and exercises. It is designed for undergraduate students and for all readers who want a first geometric approach to Special and General Relativity.

Scientific Journeys - H. Frederick Dylla 2020-09-26

This collection of essays traces a scientific journey bookmarked by remarkable mentors and milestones of science. It provides fascinating reading for everyone interested in the history, public appreciation, and value of science, as well as giving first-hand accounts of many key events and prominent figures. The author was one of the "sputnik kids" growing up in the US at the start of the space age. He built a working laser just two years after they were first invented, an experience that convinced him to become a physicist. During his 50-year career in physics, many personalities and notable events in science and technology helped to form his view of how science contributes to the modern world, including his conviction that the impact of science can be most effective when introduced within the context of the humanities - especially history, literature and the arts. From the Foreword by former U.S. Congressman, Rush D. Holt: In this volume, we have the wide-ranging thoughts and observations of Fred Dylla, an accomplished physicist with an engineer's fascination for gadgets, a historian's long perspective, an artist's aesthetic eye, and a teacher's passion for sharing ideas. Throughout his varied career [...] his curiosity has been his foremost characteristic and his ability to see the connection between apparently disparate things his greatest skill. [...] Here he examines the roots and growth of innovation in examples from Bell Laboratories, Edison Electric Light Company, and cubist painter Georges Braque. He considers the essential place of publishing in science, that epochal intellectual technique for learning how the world works. He shows the human enrichment and practical benefits that derive from wise investments in scientific research, as well as the waste resulting from a failure to embrace appropriate technologies.

Three Lectures on Complexity and Black Holes - Leonard Susskind 2020-05-11

These three lectures cover a certain aspect of complexity and black holes, namely the relation to the second law of thermodynamics. The first

lecture describes the meaning of quantum complexity, the analogy between entropy and complexity, and the second law of complexity. Lecture two reviews the connection between the second law of complexity and the interior of black holes. Prof. L. Susskind discusses how firewalls are related to periods of non-increasing complexity which typically only occur after an exponentially long time. The final lecture is about the thermodynamics of complexity, and "uncomplexity" as a resource for doing computational work. The author explains the remarkable power of "one clean qubit," in both computational terms and in space-time terms. This book is intended for graduate students and researchers who want to take the first steps towards the mysteries of black holes and their complexity.

The Nature of Scientific Knowledge - Kevin McCain 2016-06-25

This book offers a comprehensive and accessible introduction to the epistemology of science. It not only introduces readers to the general epistemological discussion of the nature of knowledge, but also provides key insights into the particular nuances of scientific knowledge. No prior knowledge of philosophy or science is assumed by *The Nature of Scientific Knowledge*. Nevertheless, the reader is taken on a journey through several core concepts of epistemology and philosophy of science that not only explores the characteristics of the scientific knowledge of individuals but also the way that the development of scientific knowledge is a particularly social endeavor. The topics covered in this book are of keen interest to students of epistemology and philosophy of science as well as science educators interested in the nature of scientific knowledge. In fact, as a result of its clear and engaging approach to understanding scientific knowledge *The Nature of Scientific Knowledge* is a book that anyone interested in scientific knowledge, knowledge in general, and any of a myriad of related concepts would be well advised to study closely.

The Technological Singularity - Victor Callaghan 2017-05-22

This volume contains a selection of authoritative essays exploring the central questions raised by the conjectured technological singularity. In informed yet jargon-free contributions written by active research scientists, philosophers and sociologists, it goes beyond philosophical discussion to provide a detailed account of the risks that the singularity poses to human society and, perhaps most usefully, the possible actions that society and technologists can take to manage the journey to any singularity in a way that ensures a positive rather than a negative impact on society. The discussions provide perspectives that cover technological, political and business issues. The aim is to bring clarity and rigor to the debate in a way that will inform and stimulate both experts and interested general readers.

Cognition and the Creative Machine - Ana-Maria Oltețeanu 2020-05-23

How would you assemble a machine that can be creative, what would its cogs be? Starting from how humans do creative problem solving, the author has developed a framework to explore whether a diverse set of creative problem-solving tasks can be solved computationally using a unified set of principles. In this book she describes the implementation of related prototype AI systems, and the computational and empirical experiments conducted. The book will be of interest to researchers, graduate students, and laypeople engaged with ideas in artificial intelligence, cognitive science, and creativity.

Springer's Journey - Naomi Black 2006-06-01

A touching children's book about an orca whale whose mother was killed and his journey back to his pod. Based on a true story in the Puget Sound

Relativity: A Journey Through Warped Space and Time - Daniel R. Mayerson 2019-11-14

This primer brilliantly exposes concepts related to special and general relativity for the absolute beginner. It can be used either as an introduction to the subject at a high school level or as a useful compass for undergraduates who want to move the first steps towards Einstein's theories. The book is enhanced throughout with many useful exercises and beautiful illustrations to aid understanding. The topics covered include: Lorentz transformations, length contraction and time dilation, the twin paradox (and other paradoxes), Minkowski spacetime, the Einstein equivalence principle, curvature of space and spacetime, geodesics, parallel transport, Einstein's equations of general relativity, black holes, wormholes, cosmology, gravitational waves, time machines, and much more.

Quantum Physics, Mini Black Holes, and the Multiverse - Yasunori Nomura 2018-02-23

"Modern physics is rife with provocative and fascinating ideas, from

quantum mechanics to the multiverse. But as interesting as these concepts are, they are also easy to understand. This book, written with deft hands by true experts in the field, helps to illuminate some of the most important and game-changing ideas in physics today." Sean M. Carroll "The Multiversal book series is equally unique, providing book-length extensions of the lectures with enough additional depth for those who truly want to explore these fields, while also providing the kind of clarity that is appropriate for interested lay people to grasp the general principles involved." Lawrence M. Krauss This book explores, explains and debunks some common misconceptions about quantum physics, particle physics, space-time, and Multiverse cosmology. It seeks to separate science from pseudoscience. The material is presented in layperson-friendly language, followed by additional technical sections which explain basic equations and principles. This feature is very attractive to non-expert readers who nevertheless seek a deeper understanding of the theories, and wish to explore beyond just the basic description. Multiversal Journeys™ is a trademark of Farzad Nekoogar and Multiversal Journeys, a 501 (c) (3) nonprofit organization.

The Amazing Journey of Reason - Mario Alemi 2019-12-03

This Open Access book explores questions such as why and how did the first biological cells appear? And then complex organisms, brains, societies and -now- connected human societies? Physicists have good models for describing the evolution of the universe since the Big Bang, but can we apply the same concepts to the evolution of aggregated matter -living matter included? *The Amazing Journey* analyzes the latest results in chemistry, biology, neuroscience, anthropology and sociology under the light of the evolution of intelligence, seen as the ability of processing information. The main strength of this book is using just two concepts used in physics -information and energy- to explain: The emergence and evolution of life: prokaryotes, eukaryotes and complex organisms The emergence and evolution of the brain The emergence and evolution of societies (human and not) Possible evolution of our "internet society" and the role that Artificial Intelligence is playing

The Cassini-Huygens Visit to Saturn - Michael Meltzer 2015-01-02

Cassini-Huygens was the most ambitious and successful space journey ever launched to the outer Solar System. This book examines all aspects of the journey: its conception and planning; the lengthy political processes needed to make it a reality; the engineering and development required to build the spacecraft; its 2.2-billion mile journey from Earth to the Ringed Planet and the amazing discoveries from the mission. The author traces how the visions of a few brilliant scientists matured, gained popularity and eventually became a reality. Innovative technical leaps were necessary to assemble such a multifaceted spacecraft and reliably operate it while it orbited a planet so far from our own. The Cassini-Huygens spacecraft design evolved from other deep space efforts, most notably the Galileo mission to Jupiter, enabling the voluminous, paradigm-shifting scientific data collected by the spacecraft. Some of these discoveries are absolute gems. A small satellite that scientists once thought of as a dead piece of rock turned out to contain a warm underground sea that could conceivably harbor life. And we now know that hiding under the mist of Saturn's largest moon, Titan, is a world with lakes, fluvial channels, and dunes hauntingly reminiscent of those on our own planet, except that on Titan, it's not water that fills those lakes but hydrocarbons. These and other breakthroughs illustrate why the Cassini-Huygens mission will be remembered as one of the greatest voyages of discovery ever made.

Journey to Ethnographic Research - Leah Shagrir 2016-10-20

This book describes a researcher's journey to carry out an ethnographic study. It serves as a tool to spread the use of ethnographic research, and to clarify the difficulties, challenges, solutions, and advantages ethnographic researchers encounter. The book describes how the various stops along the way allowed investigation of the research area from a variety of viewpoints, in order to fulfil diverse roles, and to present the research findings in a range of voices: the voice of the teacher educator, the voice of the faculty member, the voice of the ethnographic researcher, and the voice of the student. These viewpoints allowed for natural movement between the data that were gathered and the research information that was furnished. Using the voice of each role to present the issue allows one to examine it from a unique perspective and to get a broad and deep picture of the research population, process and results. Such a multi-dimensional perspective enables the presentation of a whole; emphasizing experiences, perceptions, values, world views, rules and regulations, culture and life style, interpersonal and intrapersonal relations.