Experimental Insights Into Meditation Waking Sleep And Dreams

This book is about the mechanisms of wealth creation, or what we like to think of as evolutionary "progress." The massive circular flow of goods and services between producers and consumers is not a perpetual motion machine; it has been dependent for the past 150 years on energy inputs from a finite storage of fossil fuels. In this book, you will learn about the three key requirements for wealth creation, and how this process acts according to physical laws, and usually after some part of the natural wealth of the planet has been exploited in an episode of "creative destruction." Knowledge and natural capital, particularly energy, will interact to power the human wealth engine in the future as it has in the past. Will it sputter or continue along the path of evolutionary progress that we have come to expect? Can the new immaterial wealth of information and ideas, which makes up the so-called knowledge economy, replace depleted natural wealth? These questions have no simple answers, but this masterful book will help you to understand the grand challenge of our time. Praise for Energy, Complexity and Wealth Maximization: “... people who run the modern world (politicians, economists and lawyers) have a very poor grasp of how it really works because they do not understand the fundamentals of energy, exergy and entropy ... those decision-makers would greatly benefit from reading this book ...” – Vaclav Smil, Distinguished Professor Emeritus, University of Manitoba “... A grandiose design; impressive, worth reading and reflecting!” – Prof. Dr. Ernst Ulrich von Weizäcker, Founder of Wuppertal Institute; Co-President of the Club of Rome, Former Member of the German Bundestag, co-chair of the UN’s Resource Panel “... The book is a must read for concerned citizens and decision makers across the globe.” – RK Pachauri, Founder and Executive Vice Chairman, The Energy and Resources Institute (TERI) and ex-chair, International Panel on Climate Change (IPCC)

No specialty faces more diverse and challenging ethical dilemmas than palliative medicine. What is the best way to plan ahead for the end of life? How should physicians respond when patients refuse treatments likely to be beneficial, or demand treatments not likely to be? Who makes medical decisions for patients who are too ill to decide for themselves? Do patients have the "right to die" (and, if so, what exactly does that mean)? In this volume noted palliative care physician and bioethicist Robert C. Macauley addresses a broad range of issues from historical, legal, clinical, and ethical perspectives. Clinically nuanced and philosophically rigorous, Ethics in Palliative Care analyzes hot-button subjects like physician assisted dying and euthanasia, as well as often overlooked topics such as pediatric palliative care, organ donation, palliative care research, and moral distress. Drawing on real cases yet written in non-technical language, this complete guide will appeal to both medical professionals and lay readers.

Life is a diverse and ubiquitous phenomenon on Earth, characterized by fundamental features distinguishing living bodies from nonliving material. Yet it is also so complex that it has long defied precise definition. This book from a seasoned biologist offers new insights into the nature of life by illuminating a fascinating architecture of dualities inherent in its existence and propagation. Life is connected with individual living beings, yet it is also a collective and inherently global phenomenon of the material world. It embodies a dual existence of cycles of phenotypic life, and their unseen driver – an uninterrupted march of genetic information whose collective immortality is guaranteed by individual mortality. Although evolution propagates and tunes species of organisms, the beings produced can be regarded merely as tools for the survival and cloning of genomes written in an unchanging code. What are the physical versus informational bases and driving forces of life, and how do they unite as an integrated system? What does time mean for individuals, life on the global scale, and the underlying information? This accessible examination of principles and evidence shows that a network of dualities lies at the heart of biological puzzles that have engaged the human mind for millennia.

Learning disabilities are a heterogeneous group of disorders characterized by failure to acquire, retrieve, or use information competently. They are the most severe and chronic form of learning difficulty in children. They can be present at birth or acquired as a result of illness, exposure to toxins, poor nutrition, medical treatment, sociocultural deprivation, or injury. Learning problems typically consist in failure to acquire reading, writing, or math skills, which are traditionally considered core domains. This book explores the epidemiology, neurobiological bases, and diagnostic tools necessary for a comprehensive assessment of children with learning disabilities. It also presents examples of children with specific learning disabilities and explains possible intervention strategies.

Follow a former teacher, now a Forensic Psychology Practitioner on a compelling, shocking, thrilling, and potentially explosive adventure that took place over sixteen years in Canada, South Korea, North Korea (DMZ), Japan, France, and the United Kingdom. This true account included twenty-two police forces, the FBI, the regional director of security for Asia Pacific, three embassies, the United States military, the Korean military, millionaires, and a psychopath or two. The crime spree by certain individuals included stalking, cyberstalking, extortion attempts, terrorism, hacking and cracking, breaking and entering, theft, fraud, threats, damage to property, theft of intellectual property, assault, assault causing bodily harm, psychological torture, criminal harassment, and two possible murder attempts. It is your job to examine the facts and to determine who the guilty parties are! Listen to police recordings and view evidence that can be copied and pasted into your browser by following the link at the back of the book.

This authoritative, multidisciplinary overview of altered states of consciousness (ASC) shows how their study is necessary to gain a fundamental understanding of human culture, history, and biology.

This book offers valuable guidance to neurointensivists, other neurocritical care staff, and those desiring to develop a neurocritical care unit via a thorough discussion of neurological emergencies and neurocritical care unit organization. This comprehensive volume begins with a review of acute neurological emergencies as managed clinically in the neurocritical care unit. Topics include acute cerebrovascular, neurological, and neurosurgical disorders. The unique aspect of this book is its description of the organization of the neurocritical care unit. We focus on how other services in the hospital interact with and assist neurocritical care operations, telemedicine/telestroke, and neurocritical care personnel and their roles. A review of expected outcomes of neurocritical care conditions is also included. Neurointensivists, neurocritical care unit staff leadership, hospital administrators, and those interested in developing a neurocritical care unit will find Neurointensive Care Unit: Clinical Practice and Organization to be an invaluable guide.

The present book gives a multi-disciplinary perspective on the physics of life and the particular role played by lipids (fats) and the lipid-bilayer component of cell membranes. The emphasis is on the physical properties of lipid membranes seen as soft and molecularly structured interfaces. By combining and synthesizing insights obtained from a variety of recent studies, an attempt is made to clarify what membrane structure is and how it can be quantitatively described. Furthermore, it is shown how biological function mediated by membranes is controlled by lipid membrane structure and organization on length scales ranging from the size of the individual molecule, across molecular assemblies of proteins and lipid domains in the range of nanometers, to the size of whole cells. Applications of lipids in nanotechnology and biomedicine are also described. The first edition of the present book was published in 2005 when lipidomics was still very much an emerging science and lipids about to be recognized as being as important for life as proteins, sugars, and genes. This significantly expanded and revised edition takes into account the tremendous amount of knowledge gained over the past decade. In addition, the book now includes more tutorial material on the biochemistry of lipids and the principles of lipid self-assembly. The book is aimed at undergraduate students and young research workers within physics, chemistry, biochemistry, molecular biology, nutrition, as well as pharmaceutical and biomedical sciences. From the reviews of the first edition: "This is a highly interesting book and a pleasure to read. It represents a new and excellent pedagogical introduction to the field of lipids and the biophysics of biological membranes. I reckon that physicists and chemists as well as biologists will benefit from this approach to the field and Mouritsen shows a deep insight into the physical chemistry of lipids." (Göran Lindblom, Chemistry and Physics of Lipids 2005, vol. 135, page 105-106) "The book takes the reader on an exciting journey through the lipid world, and Mouritsen attracts the attention with a lively style of writing ... . a comprehensive view of the ‘lipid sea’ can be easily achieved, gaining the right perspectives for envisaging future developments in the nascent field of lipidomics." (Carla Ferreri, ChemBioChem, Vol. 6 (8), 2005)

Whether you’re a newcomer to the ICU or a seasoned practitioner, Oh's Intensive Care Manual delivers the practical, expert answers you need to manage the conditions you see every day in the intensive care unit. This highly esteemed, bestselling medical reference book presents comprehensive detail on each topic, while maintaining a succinct, accessible style so this information can be seamlessly incorporated into your daily practice. Consult this title on your favorite e-reader, conduct rapid searches, and adjust font sizes for optimal readability. Access everything you need to know about disease processes and their management during the course of ICU rotations. Gain valuable insight into the consensus of practice and standard of ICU care as followed in the UK, Europe, India, and Australia. Take advantage of expert advice on practical issues that will be encountered on a day-to-day basis in the ICU, as well as common pitfalls in treatment and management emphasized in each chapter. Overcome the latest challenges in intensive care medicine. Ten brand-new chapters in this edition include: Palliative Care; ICU and the Elderly; Health Care Team in Intensive Care Medicine; Preparing for Examinations in Intensive Care Medicine; Ultrasound in the ICU; ECMO for Respiratory Failure; ECMO for Cardiac Failure; Cirrhosis and Acute-on-Chronic Liver Disease; Solid Tumours and their Implications in the ICU; and Delirium. Optimize patient outcomes through an even greater focus on clinical management strategies. Quickly locate essential information with an increased number of summary boxes, tables, and charts, and a new chapter organization that expedites reference.

In this thought-provoking book K ü ppers, an internationally renowned physicist, philosopher and theoretical biologist, addresses a number of science's deepest questions: Can physics advance to the origin of all things and explain the unique phenomena of life, time and history? Are there unsolvable enigmas of the world? How did life originate? Is language a general phenomenon of Nature? What is time? Is it possible to express the history of the world in formulae? Where is science leading us? These and other provocative questions essential for a deeper understanding of the world are treated here in a refreshing and stimulating manner.

This book provides an outline of theoretical concepts and their experimental verification in studies of self-organization phenomena in chemical systems, as they emerged in the mid-20th century and have evolved since. Presenting essays on selected topics, it was prepared by authors who have made profound contributions to the field. Traditionally, physical chemistry has been concerned with interactions between atoms and molecules that produce a variety of equilibrium structures - or the 'dead' order - in a stationary state. But biological cells exhibit a different 'living' kind of order, prompting E. Schr ö dinger to pose his famous question “What is life?” in 1943. Through an unprecedented theoretical and experimental development, it was later revealed that biological self-organization phenomena are in complete agreement with the laws of physics, once they are applied to a special class of thermodynamically open systems and non-equilibrium states. This knowledge has in turn led to the design and synthesis of simple inorganic systems capable of self-organization effects. These artificial 'living organisms' are able to operate on macroscopic to microscopic scales, even down to single-molecule machines. In the future, such research could provide a basis for a technological breakthrough, comparable in its impact with the invention of lasers and semiconductors. Its results can be used to control natural chemical processes, and to design artificial complex chemical processes with various functionalities. The book offers an extensive discussion of the history of research on complex chemical systems and its future prospects.

Fasting An Exceptional Human Experience Since prehistory, fasting has been used in various ways as a means of transformation. As a spiritual practice, it is the oldest and most common form of asceticism and is found in virtually every religion and spiritual tradition. In psychology, studies have suggested that fasting can alleviate the symptoms of some psychiatric conditions, including depression and schizophrenia. In medicine, fasting is one of the most promising therapies, with research suggesting that fasting can cause certain drugs, such as chemotherapy, to work better while reducing drug side-effects. Hunger striking, sometimes called political fasting, may be the most powerful application of fasting. Proof of this occurred in 1948 when Gandhi’s hunger strike caused millions of Hindus and Muslims in India to cease their fighting. As a practical guide, Randi Fredricks, Ph.D. provides detailed information on the different types of fasting, where people fast, the physiological process of fasting, and the contraindications and criticisms of fasting. Using existing literature and original research, Dr. Fredricks focuses on the transformative characteristics of fasting in the contexts of psychology, medicine, and spirituality. The relationship between fasting and transpersonal psychology is examined, with a focus on peak experiences, self-realization, and other exceptional human experiences. Dr. Fredricks demonstrates how fasting can be profoundly therapeutic, create global paradigm shifts, and provide personal mystical phenomena.

Physics underlies all complexity, including our own existence: how is this possible? How can our own lives emerge from interactions of electrons, protons, and neutrons? This book considers the interaction of physical and non-physical causation in complex systems such as living beings, and in particular in the human brain, relating this to the emergence of higher levels of complexity with real causal powers. In particular it explores the idea of top-down causation, which is the key effect allowing the emergence of true complexity and also enables the causal efficacy of non-physical entities, including the value of money, social conventions, and ethical choices.

The chips in present-day cell phones already contain billions of sub-100-nanometer transistors. By 2020, however, we will see systems-on-chips with trillions of 10-nanometer transistors. But this will be the end of the miniaturization, because yet smaller transistors, containing just a few control atoms, are subject to statistical fluctuations and thus no longer useful. We also need to worry about a potential energy crisis, because in less than five years from now, with current chip technology, the internet alone would consume the total global electrical power! This book presents a new, sustainable roadmap towards ultra-low-energy (femto-Joule), high-performance electronics. The focus is on the energy-efficiency of the various chip functions: sensing, processing, and communication, in a top-down spirit involving new architectures such as silicon brains, ultra-low-voltage circuits, energy harvesting, and 3D silicon technologies. Recognized world leaders from industry and from the research community share their views of this nanoelectronics future. They discuss, among other things, ubiquitous communication based on mobile companions, health and care supported by autonomous implants and by personal carebots, safe and efficient mobility assisted by co-pilots equipped with intelligent micro-electromechanical systems, and internet-based education for a billion people from kindergarden to retirement. This book should help and interest all those who will have to make decisions associated with future electronics: students, graduates, educators, and researchers, as well as managers, investors, and policy makers. Introduction: Towards Sustainable 2020 Nanoelectronics.- From Microelectronics to Nanoelectronics.- The Future of Eight Chip Technologies.- Analog-Digital Interfaces.- Interconnects and Transceivers.- Requirements and Markets for Nanoelectronics.- ITRS: The International Technology Roadmap for Semiconductors.- Nanolithography.- Power-Efficient Design Challenges.- Superprocessors and Supercomputers.- Towards Terabit Memories.- 3D Integration for Wireless Multimedia.- The Next-Generation Mobile User-Experience.- MEMS (Micro-Electro-Mechanical Systems) for Automotive and Consumer.- Vision Sensors and Cameras.- Digital Neural Networks for New Media.- Retinal Implants for Blind Patients.- Silicon Brains.- Energy Harvesting and Chip Autonomy.- The Energy Crisis.- The Extreme-Technology Industry.- Education and Research for the Age of Nanoelectronics.- 2020 World with Chips.

"This new edition has many new and enhanced features while it continues to rely heavily on the integration of visuals to elucidate concepts to solidify an understanding of them. Examples throughout show how to use psychology in the workplace and in personal relationships, while demonstrating the role psychology plays in other practical everyday issues. This book helps examine personal studying and learning styles with several new pedagogical aids -- encouraging readers to apply what they are learning to their everyday lives"--

This collection of prize-winning essays addresses the controversial question of how meaning and goals can emerge in a physical world governed by mathematical laws. What are the prerequisites for a system to have goals? What makes a physical process into a signal? Does eliminating the homunculus solve the problem? The three first-prize winners, Larissa Albantakis, Carlo Rovelli and Jochen Szangolies tackle exactly these challenges, while many other aspects (agency, the role of the observer, causality versus teleology, ghosts in the machine etc.) feature in the other award winning contributions. All contributions are accessible to non-specialists. These seventeen stimulating and often entertaining essays are enhanced versions of the prize-winning entries to the FQXi essay competition in 2017.The Foundational Questions Institute, FQXi, catalyzes, supports, and disseminates research on questions at the foundations of physics and cosmology, particularly new frontiers and innovative ideas integral to a deep understanding of reality, but unlikely to be supported by conventional funding sources.

The essays in this book look at the question of whether physics can be based on information, or – as John Wheeler phrased it – whether we can get “It from Bit”. They are based on the prize-winning essays submitted to the FQXi essay competition of the same name, which drew over 180 entries. The eighteen contributions address topics as diverse as quantum foundations, entropy conservation, nonlinear logic and countable spacetime. Together they provide stimulating reading for all physics aficionados interested in the possible role(s) of information in the laws of nature. The Foundational Questions Institute, FQXi, catalyzes, supports, and disseminates research on questions at the foundations of physics and cosmology, particularly new frontiers and innovative ideas integral to a deep understanding of reality, but unlikely to be supported by conventional funding sources.

Using an engaging storytelling approach, Culture and Psychology introduces students to culture from a scientific yet accessible point of view. Author Stephen Fox integrates art, literature, and music into each chapter to offer students a rich and complete picture of cultures from around the world. The text wholly captures students’ attention while addressing key concepts typically found in a Psychology of Culture or Cross-Cultural Psychology course. Chapters feature personalized, interdisciplinary stories to help students understand specific concepts and theories, and encourage them to make connections between the material and their own lives.

Born after World War II, large-scale experimental high-energy physics (HEP) has found itself limited ever since by available accelerator, detector and computing technologies. Accordingly, HEP has made significant contributions to the development of these fields, more often than not driving their innovations. The invention of the World Wide Web at CERN is merely the best-known example out of many. This book is the first comprehensive account to trace the history of this pioneering spirit in the field of computing technologies. It covers everything up to and including the present-day handling of the huge demands imposed upon grid and distributed computing by full-scale LHC operations—operations which have for years involved many thousands of collaborating members worldwide and accordingly provide the original and natural testbed for grid computing concepts. This book takes the reader on a guided tour encompassing all relevant topics, including programming languages, software engineering, large databases, the Web, and grid- and cloud computing. The important issue of intellectual property regulations for distributed software engineering and computing is also addressed. Aptly, the book closes with a visionary chapter of what may lie ahead. Approachable and requiring only basic understanding of physics and computer sciences, this book is intended for both education and research.

This book addresses key conceptual issues relating to the modern scientific and engineering use of computer simulations. It analyses a broad set of questions, from the nature of computer simulations to their epistemological power, including the many scientific, social and ethics implications of using computer simulations. The book is written in an easily accessible narrative, one that weaves together philosophical questions and scientific technicalities. It will thus appeal equally to all academic scientists, engineers, and researchers in industry interested in questions (and conceivable answers) related to the general practice of computer simulations.

Music is a tremendously powerful channel through which people develop their personal and social identities. Music is used to communicate emotions, thoughts, political statements, social relationships, and physical expressions. But, just as language can mediate the construction and negotiation of developing identities, so music can also be a means of communication through which aspects of people's identities are constructed. Music can have a profound influence on our developing sense of identity, our values, and our beliefs, be it from rock music, classical music, or jazz. Musical identities (MacDonald, Hargreaves and Miell, 2002) was unique in being in being one of the first books to explore this fascinating topic. This new book documents the remarkable expansion and growth in the study of musical identities since the publication of the earlier work. The editors identify three main features of current psychological approaches to musical identities, which concern their definition, development, and the identification of individual differences, as well as four main real-life contexts in which musical identities have been investigated, namely in music and musical institutions; specific geographical communities; education; and in health and well-being. This conceptual framework provides the rationale for the structure of the Handbook. The book is divided into seven main sections. The first, 'Sociological, discursive and narrative approaches', includes several general theoretical accounts of musical identities from this perspective, as well as some more specific investigations. The second and third main sections deal in depth with two of the three psychological topics described above, namely the development of and individual differences in musical identities. The fourth, fifth and sixth main sections pursue three of the real-life contexts identified above, namely 'Musical institutions and practitioners', 'Education', and 'Health and well-being'. The seventh and final main section of the Handbook - 'Case studies' - includes chapters which look at particular musical identities in specific times, places, or contexts. The multidisciplinary range and breadth of the Handbook's contents reflect the rapid changes that are taking place in music, in digital technology, and in their role in society as a whole, such that the study of musical identity is likely to proliferate even further in the future.

This authoritative, multidisciplinary overview of altered states of consciousness (ASC) shows how their study is necessary to gain a fundamental understanding of human culture, history, and biology. • Contains various illustrations in the two volumes • Presents a bibliography of representative references to the literature on altered states across various disciplines and languages • Provides convenient cross-referencing of subjects across chapters

States of ConsciousnessExperimental Insights into Meditation, Waking, Sleep and DreamsSpringer Science & Business Media

This open access book chronicles the rise of a new scientific paradigm offering novel insights into the age-old enigmas of existence. Over 300 years ago, the human mind discovered the machine code of reality: mathematics. By utilizing abstract thought systems, humans began to decode the workings of the cosmos. From this understanding, the current scientific paradigm emerged, ultimately discovering the gift of technology. Today, however, our island of knowledge is surrounded by ever longer shores of ignorance. Science appears to have hit a dead end when confronted with the nature of reality and consciousness. In this fascinating and accessible volume, James Glattfelder explores a radical paradigm shift uncovering the ontology of reality. It is found to be information-theoretic and participatory, yielding a computational and programmable universe.

Chips 2020
Transcendental Meditation in Contemporary Medical Care
Dreaming
Which of Our Fundamental Assumptions Are Wrong?
Top-Down Causation in the Human Context
Spirals and Vortices
The Dual Nature of Life
Handbook of Musical Identities
Why More Is Different
The Challenge of Chance
Probability in Physics
Neurological Bases, Clinical Features and Strategies of Intervention
How Far Can Science Take Us?
A Complete Guide

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 book presents a multidisciplinary perspective on chance, with contributions from distinguished researchers in the areas of biology, cognitive neuroscience, economics, genetics, general history, law, linguistics, logic, mathematical physics, statistics, theology and philosophy. The individual chapters are bound together by a general introduction followed by an opening chapter that surveys 2500 years of linguistic, philosophical, and scientific reflections on chance, coincidence, fortune, randomness, luck and related concepts. A main conclusion that can be drawn is that, even after all this time, we still cannot be sure whether chance is a truly fundamental and irreducible phenomenon, in that certain events are simply uncaused and could have been otherwise, or whether it is always simply a reflection of our ignorance. Other challenges that emerge from this book include a better understanding of the contextuality and perspectival character of chance (including its scale-dependence), and the curious fact that, throughout history (including contemporary science), chance has been used both as an explanation and as a hallmark of the absence of explanation. As such, this book challenges the reader to think about chance in a new way and to come to grips with this endlessly fascinating phenomenon.

The essays in this book look at way in which the fundaments of physics might need to be changed in order to make progress towards a unified theory. They are based on the prize-winning essays submitted to the FQXi essay competition "Which of Our Basic Physical Assumptions Are Wrong?", which drew over 270 entries. As Nobel Laureate physicist Philip W. Anderson realized, the key to understanding nature's reality is not anything "magical", but the right attitude, "the focus on asking the right questions, the willingness to try (and to discard) unconventional answers, the sensitive ear for phoniness, self-deception, bombast, and conventional but unproven assumptions." The authors of the eighteen prize-winning essays have, where necessary, adapted their essays for the present volume so as to (a) incorporate the community feedback generated in the online discussion of the essays, (b) add new material that has come to light since their completion and (c) to ensure accessibility to a broad audience of readers with a basic grounding in physics. The Foundational Questions Institute, FQXi, catalyzes, supports, and disseminates research on questions at the foundations of physics and cosmology, particularly new frontiers and innovative ideas integral to a deep understanding of reality, but unlikely to be supported by conventional funding sources.

The fourteen award-winning essays in this volume discuss a range of novel ideas and controversial topics that could decisively influence the course of human life on Earth. Their authors address, in accessible language, issues as diverse as: enabling our social systems to learn; research in biological engineering and artificial intelligence; mending and enhancing minds; improving the way we do, and teach, science; living in the here and now; and the value of play. The essays are enhanced versions of the prize-winning entries submitted to the Foundational Questions Institute (FQXi) essay competition in 2014. FQXi, catalyzes, supports, and disseminates research on questions at the foundations of physics and cosmology, particularly new frontiers and innovative ideas integral to a deep understanding of reality, but unlikely to be supported by conventional funding sources.

In this accessible overview of current knowledge, an expert team of editors and authors describe experimental approaches to consciousness. These approaches are shedding light on some of the hitherto unknown aspects of the distinct states of human consciousness, including the waking state, different states of sleep and dreaming, meditation and more. The book presents the latest research studies by the contributing authors, whose specialities span neuroscience, neurology, biomedical engineering, clinical psychology and psychophysiology, psychosocial medicine and anthropology. Overall this anthology provides the reader with a clear picture of how different states of consciousness can be defined, experimentally measured and analysed. A future byproduct of this knowledge may be anticipated in the development of systematic corrective treatments for many disorders and pathological problems of consciousness.

What is the role and meaning of probability in physical theory, in particular in two of the most successful theories of our age, quantum physics and statistical mechanics? Laws once conceived as universal and deterministic, such as Newton's laws of motion, or the second law of thermodynamics, are replaced in these theories by inherently probabilistic laws. This collection of essays by some of the world's foremost experts presents an in-depth analysis of the meaning of probability in contemporary physics. Among the questions addressed are: How are probabilities defined? Are they objective or subjective? What is their explanatory value? What are the differences between quantum and classical probabilities? The result is an informative and thought-provoking book for the scientifically inquisitive.

A comprehensive proposal for a conceptual framework for describing conscious experience in dreams, integrating philosophy of mind, sleep and dream research, and interdisciplinary consciousness studies.

The physics of condensed matter, in contrast to quantum physics or cosmology, is not traditionally associated with deep philosophical questions. However, as science - largely thanks to more powerful computers - becomes capable of analysing and modelling ever more complex many-body systems, basic questions of philosophical relevance arise. Questions about the emergence of structure, the nature of cooperative behaviour, the implications of the second law, the quantum-classical transition and many other issues. This book is a collection of essays by leading physicists and philosophers. Each investigates one or more of these issues, making use of examples from modern condensed matter research. Physicists and philosophers alike will find surprising and stimulating ideas in these pages.

Chemical Complexity
Multidisiplinary Perspectives
Interplay of the Individual and the Genome
Ethics in Palliative Care
The Computability of the World
A Multidisciplinary Approach from Science and the Humanities
Energy, Complexity and Wealth Maximization
CHIPS 2020 VOL. 2
In Culture, Nature, and Science
States of Consciousness
Experimental Insights into Meditation, Waking, Sleep and Dreams
Local Becoming in Modern Physics
The Reality of Time Flow
Questioning the Foundations of Physics

The release of this second volume of CHIPS 2020 coincides with the 50th anniversary of Moore's Law, a critical year marked by the end of the nanometer roadmap and by a significantly reduced annual rise in chip performance. At the same time, we are witnessing a data explosion in the Internet, which is consuming 40% more electrical power every year, leading to fears of a major blackout of the Internet by 2020. The messages of the first CHIPS 2020, published in 2012, concerned the realization of quantum steps for improving the energy efficiency of all chip functions. With this second volume, we review these messages and amplify upon the most promising directions: ultra-low-voltage electronics, nanoscale monolithic 3D integration, relevant-data, brain- and human-vision-inspired processing, and energy harvesting for chip autonomy. The team of authors, enlarged by more world leaders in low-power, monolithic 3D, video, and Silicon brains, presents new vistas in nanoelectronics, promising Moore-like exponential growth sustainable through to the 2030s.

The rise of modern science has brought with it increasing acceptance among intellectual elites of a worldview that conflicts sharply both with everyday human experience and with beliefs widely shared among the world's great cultural traditions. Most contemporary scientists and philosophers believe that reality is at bottom purely physical, and that human beings are nothing more than extremely complicated biological machines. On such views our everyday experiences of conscious decision-making, free will, and the self are illusory by-products of the grinding of our neural machinery. It follows that mind and personality are necessarily extinguished at death, and that there exists no deeper transpersonal or spiritual reality of any sort. Beyond Physicalism is the product of an unusual fellowship of scientists and humanities scholars who dispute these views. In their previous publication, Irreducible Mind, they argued that physicalism cannot accommodate various well-evidenced empirical phenomena including paranormal or psi phenomena, postmortem survival, and mystical experiences. In this new theory-oriented companion volume they go further by attempting to understand how the world must be constituted in order that these "rogue" phenomena can occur. Drawing upon empirical science, metaphysical philosophy, and the mystical traditions, the authors work toward an improved "big picture" of the general character of reality, one which strongly overlaps territory traditionally occupied by the world's institutional religions, and which attempts to reconcile science and spirituality by finding a middle path between the polarized fundamentalisms, religious and scientific, that have dominated recent public discourse. Contributions by: Harald Atmanspacher, Loriliai Biernacki, Bernard Carr, Wolfgang Fach, Michael Grosso, Michael Murphy, David E. Presti, Gregory Shaw, Henry P. Stapp, Eric M. Weiss, and Ian Whicher

This book investigates the central metaphysics and epistemology of Advaita. Although the vastness of Advaita literature has grown to immense proportions, there has been a glaring lacuna in unraveling its philosophical, theological and religious implications. This volume undertakes a thematic search on the conception of ?tman in an all-important Advaitic text, the Vivekac???ma?i , and other supportive texts of the same genre. Walter Menezes aims to revive Advaita as a sound philosophical system by driving away the cloud of negativity associated with it, thereby opening a new chapter in the history of Advaita philosophy.

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.

The Wiley Blackwell Handbook of Transpersonal Psychology presents the most inclusive resource yet published on this topic - which seeks to benefit humanity by integrating ancient wisdom and modern knowledge. Features the work of more than fifty leading voices in the field, creating the most comprehensive survey of transpersonal psychology yet published Includes emerging and established perspectives Charts the breadth and diversity of the transpersonal landscape Covers topics including shamanism, neurobiology, holotropic states, transpersonal experiences, and more

It is commonly held that there is no place for the 'now' in physics, and also that the passing of time is something subjective, having to do with the way reality is experienced but not with the way reality is. Indeed, the majority of modern theoretical physicists and philosophers of physics contend that the passing of time is incompatible with modern physical theory, and excluded in a fundamental description of physical reality. This book provides a forceful rebuttal of such claims. In successive chapters the author explains the historical precedents of the modern opposition to time flow, giving careful expositions of matters relevant to becoming in classical physics, the special and general theories of relativity, and quantum theory, without presupposing prior expertise in these subjects. Analysing the arguments of thinkers ranging from Aristotle, Russell, and Bergson to the proponents of quantum gravity, he contends that the passage of time, understood as a local becoming of events out of those in their past at varying rates, is not only compatible with the theories of modern physics, but implicit in them.

This book provides health care professionals and others with an understanding of over three decades of research on Transcendental Meditation and the treatment of chronic medical and psychiatric disorders as well as the use of Transcendental Meditation in effective health programs with a wide range of disorders and patient populations.

In the late nineteenth century, dreams became the subject of scientific study for the first time, after thousands of years of being considered a primarily spiritual phenomenon. Before Freud and the rise of psychoanalytic interpretation as the dominant mode of studying dreams, an international group of physicians, physiologists, and psychiatrists pioneered scientific models of dreaming. Collecting data from interviews, structured observation, surveys, and their own dream diaries, these scholars produced a large body of early research on the sleeping brain in the late nineteenth and early twentieth centuries. This book uncovers an array of case studies from this overlooked period of dream scholarship. With contributors working across the disciplines of psychology, history, literature, and cultural studies, it highlights continuities and ruptures in the history of scientific inquiry into dreams.

The Technological Singularity
Lipids in a Membrane Biophysics Perspective
Information—Consciousness—Reality
From the Web to the Grid and Beyond
Computer Simulations in Science and Engineering
On Physics and Information
How Can Mindless Mathematical Laws Give Rise to Aims and Intention?
Clinical Practice and Organization