Sélection: sciences et santé



THE END OF ASTRONAUTS: Why Robots are the Future of Space

Exploration

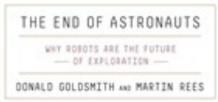
Donald Goldsmith, Martin Rees

A world-renowned astronomer and an esteemed science writer make the provocative argument for space exploration without astronauts.

Human journeys into space fill us with wonder. But the thrill of space travel for astronauts comes at enormous expense and is fraught with peril. As our robot explorers grow more competent, governments and corporations must ask, does our desire to send astronauts to the Moon and Mars justify the cost and danger? Donald Goldsmith and Martin Rees believe that beyond low-Earth orbit, space exploration should proceed without humans.

In THE END OF ASTRONAUTS, Goldsmith and Rees weigh the benefits and risks of human exploration across the solar system. In space, humans require air, food, and water, along with protection from potentially deadly radiation and high-energy particles, at a cost of more than ten times that of robotic exploration. Meanwhile, automated explorers have demonstrated the ability to investigate planetary surfaces efficiently and effectively, operating autonomously or under direction from Earth. Although Goldsmith and Rees are alert to the limits of artificial intelligence, they know that our robots steadily improve, while our bodies do not. Today a robot cannot equal a geologist's expertise, but by the time we land a geologist on Mars, this advantage will diminish significantly.

Decades of research and experience, together with interviews with scientific authorities and former astronauts, offer convincing arguments that robots represent the future of space exploration. THE END OF ASTRONAUTS also examines how spacefaring AI might be regulated as corporations race to privatize the stars. We may eventually decide that humans belong in space despite the dangers and expense, but their paths will follow routes set by robots.





Harvard University Press April 2022

THE GUESTS OF ANTS: How Myrmecophiles Interact with Their

Hosts

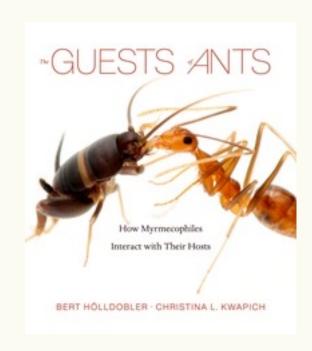
Bert Hölldobler, Christina L. Kwapich

A fascinating examination of socially parasitic invaders, from butterflies to bacteria, that survive and thrive by exploiting the communication systems of ant colonies.

Down below, on sidewalks, in fallen leaves, and across the forest floor, a covert invasion is taking place. Ant colonies, revered and studied for their complex collective behaviors, are being infiltrated by tiny organisms called myrmecophiles. Using incredibly sophisticated tactics, various species of butterflies, beetles, crickets, spiders, fungi, and bacteria insert themselves into ant colonies and decode the colonies' communication system. Once able to "speak the language," these outsiders can masquerade as ants. Suddenly colony members can no longer distinguish friend from foe.

Pulitzer Prize—winning author and biologist Bert Hölldobler and behavioral ecologist Christina L. Kwapich explore this remarkable phenomenon, showing how myrmecophiles manage their feat of code-breaking and go on to exploit colony resources. Some myrmecophiles slip themselves into their hosts' food sharing system, stealing liquid nutrition normally exchanged between ant nestmates. Other intruders use specialized organs and glandular secretions to entice ants or calm their aggression. Guiding readers through key experiments and observations, Hölldobler and Kwapich reveal a universe of behavioral mechanisms by which myrmecophiles turn ants into unwilling servants.

As THE GUESTS OF ANTS makes clear, symbiosis in ant societies can sometimes be mutualistic, but, in most cases, these foreign intruders exhibit amazingly diverse modes of parasitism. Like other unwelcome guests, many of these myrmecophiles both disrupt and depend on their host, making for an uneasy coexistence that nonetheless plays an important role in the balance of nature.



Harvard University Press July 2022

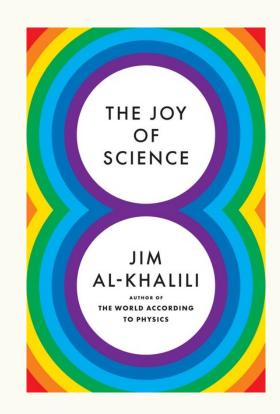
THE JOY OF SCIENCE

Jim Al-Khalili

Today's world is unpredictable and full of contradictions, and navigating its complexities while trying to make the best decisions is far from easy. THE JOY OF SCIENCE presents 8 short lessons on how to unlock the clarity, empowerment, and joy of thinking and living a little more scientifically.

In this brief guide to leading a more rational life, acclaimed physicist Jim Al-Khalili invites readers to engage with the world as scientists have been trained to do. The scientific method has served humankind well in its quest to see things as they really are, and underpinning the scientific method are core principles that can help us all navigate modern life more confidently. Discussing the nature of truth and uncertainty, the role of doubt, the pros and cons of simplification, the value of guarding against bias, the importance of evidence-based thinking, and more, Al-Khalili shows how the powerful ideas at the heart of the scientific method are deeply relevant to the complicated times we live in and the difficult choices we make.

Read this book and discover the joy of science. It will empower you to think more objectively, see through the fog of your own preexisting beliefs, and lead a more fulfilling life.



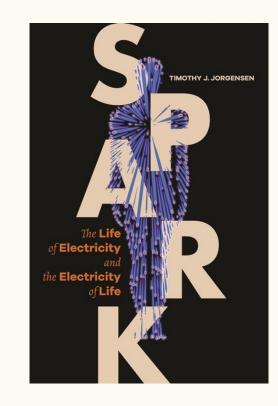
Princeton University Press April 2022

SPARK: The Life of Electricity and the Electricity of Life Timothy J. Jorgensen

The story of how we came to understand electricity's essential role in all life is rooted in our observations of its influences on the body—influences governed by the body's central nervous system. SPARK explains the science of electricity from this fresh, biological perspective. Through vivid tales of scientists and individuals—from Benjamin Franklin to Elon Musk—Timothy Jorgensen shows how our views of electricity and the nervous system evolved in tandem, and how progress in one area enabled advancements in the other. He explains how these developments have allowed us to understand—and replicate—the ways electricity enables the body's essential functions of sight, hearing, touch, and movement itself.

Throughout, Jorgensen examines our fascination with electricity and how it can help or harm us. He explores a broad range of topics and events, including the Nobel Prize—winning discoveries of the electron and neuron, the history of experimentation involving electricity's effects on the body, and recent breakthroughs in the use of electricity to treat disease.

Filled with gripping adventures in scientific exploration, SPARK offers an indispensable look at electricity, how it works, and how it animates our lives from within and without.



Princeton University Press November 2021

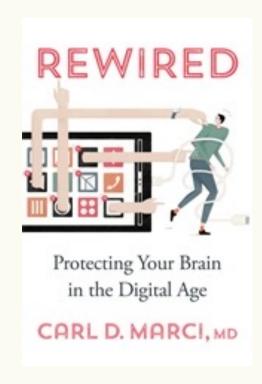
REWIRED: Protecting Your Brain in the Digital Age Carl D. Marci, MD

Living in an age of digital distraction has wreaked havoc on our brains—but there's much we can do to restore our techlife balance.

We live in a world that is always on, where everyone is always connected. But we feel increasingly disconnected. Why? The answer lies in our brains. Carl D. Marci, MD, a leading expert on social and consumer neuroscience, reviews the mounting evidence that overuse of smart phones and social media is rewiring our brains, resulting in a losing deal: we are neglecting the relationships that sustain us and keep us healthy in favor of weaker and more ephemeral ties.

The ability to connect and form strong social bonds is fundamental to human experience and emerged through unique structures in our brains. But ever-more-powerful technologies and ubiquitous access to media have hijacked our need to connect intimately and emotionally with others. The quick highs of clicking "Like" and swiping right overstimulate the same neurological reward centers associated with social relationships. The habits that accompany our digital lifestyles are putting tremendous pressure on critical components of the brain associated with attention, emotion, and memory, changing how we process information and altering how we communicate and relate, even at a physiological level.

As a psychiatrist working at the forefront of research on the impact of digital technology, Marci has seen this transformation up close and developed a range of responses. REWIRED provides scientifically supported solutions for everyone who wants to restore their tech-life balance—from parents concerned about their children's exposure to the internet to stressed workers dealing with the deluge of emails and managing the expectation of 24/7 availability.



Harvard University Press May 2022

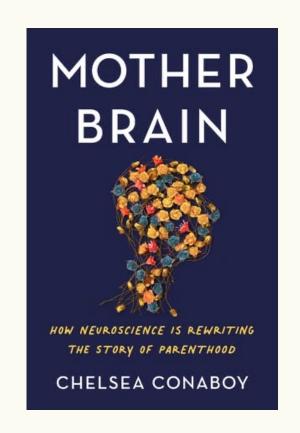
MOTHER BRAIN: How Neuroscience is Rewriting the Story of

Parenthood

Chelsea Conaboy

The surge of hormones at childbirth sets off both structural and functional changes in birthing parents' brains designed to help them meet their babies' basic needs in those tenuous first days, and then prepares them for a much longer period of learning how to parent. These changes are so dramatic that researchers studying brain anatomy can easily sort those who have had a pregnancy from those who haven't. And, scientists have discovered in recent years, it's not only the postpartum brain that changes. The brains of fathers and non-gestational parents—anyone really engaged in the work of caring for a baby—change in profound ways, too. The emerging science provides key insights into the wide-ranging experience of parenthood—from the intensity of emotions to the unexpected upsides to its larger role in shaping human nature. The story that exists in the science today is far more meaningful than the idea that mothers spring into being by instinct. Yet this science has remained almost entirely absent from the public conversation about what it means to be a parent.

Weaving the latest neuroscience and social psychology together with new reporting, Conaboy delves into the myths and realities of the parental brain, including generations of scientific neglect and societal pressures that have perpetuated a narrow, romanticized view. MOTHER BRAIN forms a powerful new narrative—one that will reframe the conversation about parenthood.



Henry Holt & Co. September 2022

SO SIMPLE A BEGINING: How Four Physical Principles Shape Our

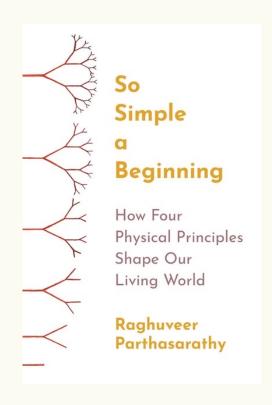
Living World

Raghuveer Parthasarathy

The form and function of a sprinting cheetah are quite unlike those of a rooted tree. A human being is very different from a bacterium or a zebra. The living world is a realm of dazzling variety, yet a shared set of physical principles shapes the forms and behaviors of every creature in it. SO SIMPLE A BEGINNING shows how the emerging new science of biophysics is transforming our understanding of life on Earth and enabling potentially lifesaving but controversial technologies such as gene editing, artificial organ growth, and ecosystem engineering.

Raghuveer Parthasarathy explains how four basic principles—self-assembly, regulatory circuits, predictable randomness, and scaling—shape the machinery of life on scales ranging from microscopic molecules to gigantic elephants. He describes how biophysics is helping to unlock the secrets of a host of natural phenomena, such as how your limbs know to form at the proper places, and why humans need lungs but ants do not. Parthasarathy explores how the cutting-edge biotechnologies of tomorrow could enable us to alter living things in ways both subtle and profound.

Featuring dozens of original watercolors and drawings by the author, this sweeping tour of biophysics offers astonishing new perspectives on how the wonders of life can arise from so simple a beginning.



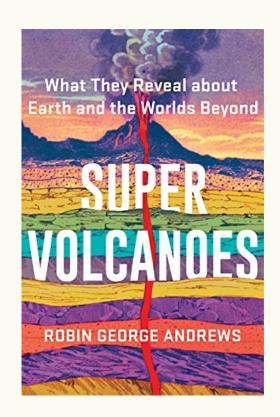
Princeton University Press February 2022

SUPER VOLCANOES: What They Reveal about Earth and the Worlds Beyond

Robin George Andrews

Volcanoes are capable of acts of pyrotechnical prowess verging on magic: they spout black magma more fluid than water, create shimmering cities of glass at the bottom of the ocean and frozen lakes of lava on the moon, and can even tip entire planets over. Between lava that melts and re-forms the landscape, and noxious volcanic gases that poison the atmosphere, volcanoes have threatened life on Earth countless times in our planet's history. Yet despite their reputation for destruction, volcanoes are inseparable from the creation of our planet.

A lively and utterly fascinating guide to these geologic wonders, SUPER VOLCANOES revels in the incomparable power of volcanic eruptions past and present, Earthbound and otherwise—and recounts the daring and sometimes death-defying careers of the scientists who study them. Science journalist and volcanologist Robin George Andrews explores how these eruptions reveal secrets about the worlds to which they belong, describing the stunning ways in which volcanoes can sculpt the sea, land, and sky, and even influence the machinery that makes or breaks the existence of life.



W.W. Norton November 2021

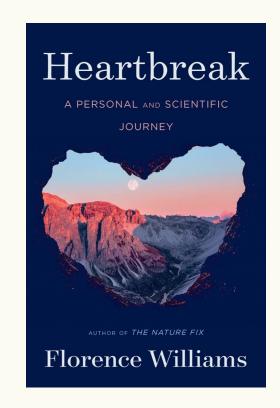
HEARTBREAK: A Personal and Scientific Journey

Florence Williams

Florence Williams explores the fascinating, cutting-edge science of heartbreak while seeking creative ways to mend her own.

When her twenty-five-year marriage unexpectedly falls apart, journalist Florence Williams expects the loss to hurt. What she doesn't expect is that she'll end up in the hospital, examining close-up the way our cells listen to loneliness. She travels to the frontiers of the science of "social pain" to learn why heartbreak hurts so much and why so much of the conventional wisdom about it is wrong.

Searching for insight as well as personal strategies to game her way back to health, Williams tests her blood for genetic markers of grief, undergoes electrical shocks in a laboratory while looking at pictures of her ex, and ventures to the wilderness in search of awe as an antidote to loneliness. For readers of WILD and LAB GIRL, HEARTBREAK is a remarkable merging of science and self-discovery that will change the way we think about loneliness, health, and what it means to fall in and out of love.



W.W. Norton February 2022

THE MYTH OF ARTIFICIAL INTELLIGENCE: Why Computers

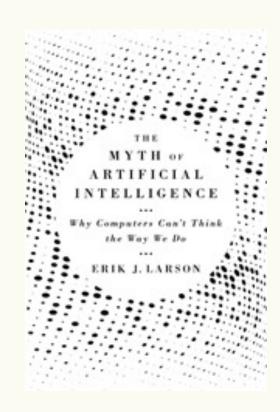
Can't the Way We Do

Erik J. Larson

Futurists insist that AI will soon eclipse the capacities of the most gifted human mind. What hope do we have against superintelligent machines? But we aren't really on the path to developing intelligent machines. In fact, we don't even know where that path might be.

A tech entrepreneur and pioneering research scientist working at the forefront of natural language processing, Erik Larson takes us on a tour of the landscape of AI to show how far we are from superintelligence, and what it would take to get there. Ever since Alan Turing, AI enthusiasts have equated artificial intelligence with human intelligence. This is a profound mistake. AI works on inductive reasoning, crunching data sets to predict outcomes. But humans don't correlate data sets: we make conjectures informed by context and experience. Human intelligence is a web of best guesses, given what we know about the world. We haven't a clue how to program this kind of intuitive reasoning, known as abduction. Yet it is the heart of common sense. That's why Alexa can't understand what you are asking, and why AI can only take us so far.

Larson argues that AI hype is both bad science and bad for science. A culture of invention thrives on exploring unknowns, not overselling existing methods. Inductive AI will continue to improve at narrow tasks, but if we want to make real progress, we will need to start by more fully appreciating the only true intelligence we know—our own.



Harvard University Press June 2021

THE MATERNAL IMPRINT: The Contested Science of Maternal-Fetal

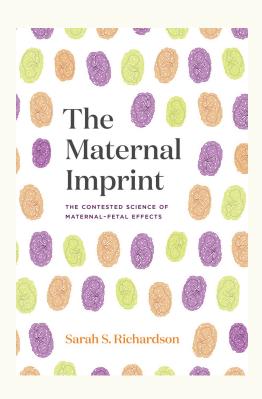
Effects

Sarah S. Richardson

The idea that a woman may leave a biological trace on her gestating offspring has long been a commonplace folk intuition and a matter of scientific intrigue, but the form of that idea has changed dramatically over time. Beginning with the advent of modern genetics at the turn of the twentieth century, biomedical scientists dismissed any notion that a mother—except in cases of extreme deprivation or injury—could alter her offspring's traits. Consensus asserted that a child's fate was set by a combination of its genes and post-birth upbringing.

Over the last fifty years, however, this consensus was dismantled, and today, research on the intrauterine environment and its effects on the fetus is emerging as a robust program of study in medicine, public health, psychology, evolutionary biology, and genomics. Collectively, these sciences argue that a woman's experiences, behaviors, and physiology can have life-altering effects on offspring development.

Tracing a genealogy of ideas about heredity and maternal-fetal effects, this book offers a critical analysis of conceptual and ethical issues—in particular, the staggering implications for maternal well-being and reproductive autonomy—provoked by the striking rise of epigenetics and fetal origins science in postgenomic biology today.



University of Chicago Press November 2021

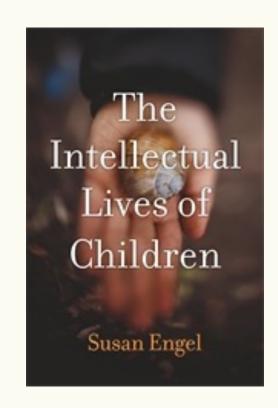
THE INTELLECTUAL LIVES OF CHILDREN

Susan Engel

A look inside the minds of young children shows how we can better nurture their abilities to think and grow.

Adults easily recognize children's imagination at work as they play. Yet most of us know little about what really goes on inside their heads as they encounter the problems and complexities of the world around them. In THE INTELLECTUAL LIVES OF CHILDREN, Susan Engel brings together an extraordinary body of research to explain how toddlers, preschoolers, and elementary-aged children think. By understanding the science behind how children observe their world, explain new phenomena, and solve problems, parents and teachers will be better equipped to guide the next generation to become perceptive and insightful thinkers.

The activities that engross kids can seem frivolous, but they can teach us a great deal about cognitive development. A young girl's bug collection reveals important lessons about how children ask questions and organize information. Watching a young boy scoop mud can illuminate the process of invention. When a child ponders the mystery of death, we witness how children build ideas. But adults shouldn't just stand around watching. When parents are creative, it can rub off on their children. Engel shows how parents and teachers can stimulate children's curiosity by presenting them with mysteries to solve.



Harvard University Press January 2021

HOW TO BUILD AN ALIEN: Hypotheses of Extraterrestrial Biology Marco Ferrari

What forms of life might we find on other planets? Will they obey to laws and rules that we know, or will their biology be entirely different? Who, or what, will welcome the first explorers?

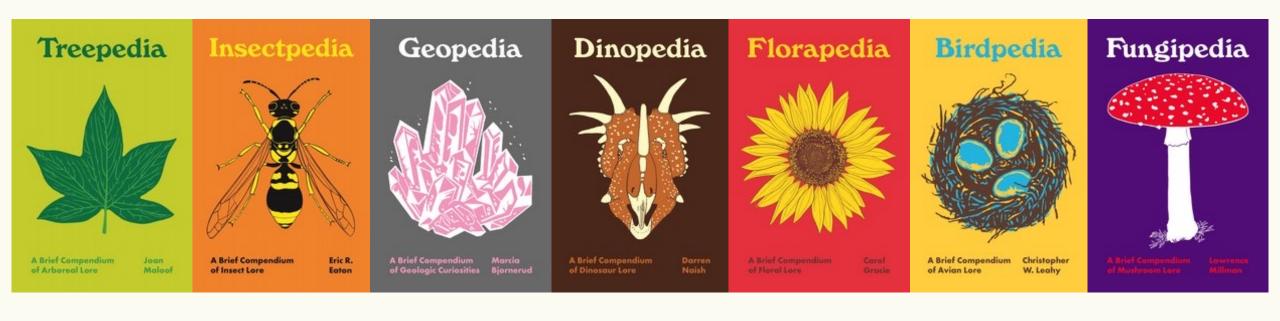
There are few doubts that the laws of physics and chemistry apply on Earth as on other planets, that a body falls with a certain acceleration of gravity and that two chemical elements can join with particular bonds even on celestial bodies orbiting around an alien star. But we do not have the same certainty for biology. Even with different declinations, will we always have prey and predators? Will their dynamics be the same as we observe on Earth? And the cell, the basis of life, is it really so indispensable to create bodies of increasing size? In search of universal or local laws, Marco Ferrari leads us to solitary planets where only one very simple species lives, and to others even richer than Earth, where millions of living beings form a symbiotic and holistic whole. We will explore celestial bodies where life has "stopped" at a certain point of complexity, and others where biochemistry has led to solutions completely different from those we could find even in the most remote and obscure places on our planet. To discover that, most likely, the differences in structures, skeletons, organs, senses and other things always depend on one universal process: evolution.



Codice Edizioni October 2021

PEDIA BOOKS - A Collection by Princeton University Press

Encyclopedic in nature and miniature in form, books in this series explore the wonders of the natural world, from A to Z. These brief compendiums cover wide ground in thoughtful, witty, and endlessly fascinating entries on the science, natural history, and culture of their subjects.



THE WORLD ACCORDING TO PHYSICS

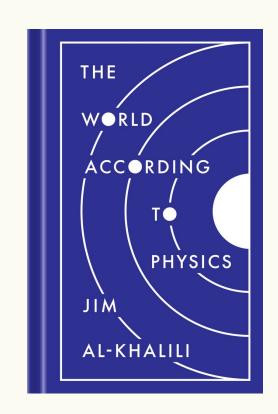
Jim Al-Khalili

Shining a light on the most profound insights revealed by modern physics, Jim Al-Khalili invites us all to understand what this crucially important science tells us about the universe and the nature of reality itself.

Al-Khalili begins by introducing the fundamental concepts of space, time, energy, and matter, and then describes the three pillars of modern physics—quantum theory, relativity, and thermodynamics—showing how all three must come together if we are ever to have a full understanding of reality. Using wonderful examples and thought-provoking analogies, Al-Khalili illuminates the physics of the extreme cosmic and quantum scales, the speculative frontiers of the field, and the physics that underpins our everyday experiences and technologies, bringing the reader up to speed with the biggest ideas in physics in just a few sittings. Physics is revealed as an intrepid human quest for ever more foundational principles that accurately explain the natural world we see around us, an undertaking guided by core values such as honesty and doubt. The knowledge discovered by physics both empowers and humbles us, and still, physics continues to delve valiantly into the unknown.

Making even the most enigmatic scientific ideas accessible and captivating, this deeply insightful book illuminates why physics matters to everyone and calls one and all to share in the profound adventure of seeking truth in the world around us.

Rights sold to: Romanian (Humanitas), Bulgarian (Damyan Yakov), Polish (Zysk), Turkish (Epsilon), Spanish (Alianza), Chinese Simplified (Beijing Imaginist Time Co), Italian (Bollati), Ukrainian (Fabula), Greek (Travlos), Portuguese (Temas e Debates), Russian (Progress Kniga), Japanese (Newton Press), Hungarian (Libri), Slovak (Ikar), Arabic (Adab Publishing House) and Indonesian (Kepustakaan Populer Gramedia)



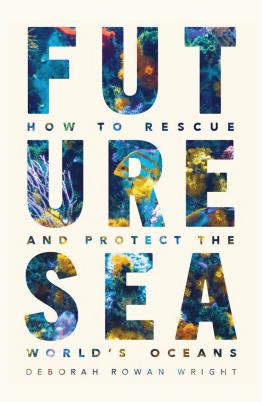
Princeton University Press
March 2020

FUTURE SEA: How to Rescue and Protect the World's Oceans

Deborah Rowan Wright

In the blues of the world's oceans swim stories of successful conservation efforts—but while a pod of whales may be protected in one region, or a coral reef restored in another, the ocean is a singular, dynamic ecosystem, and using smarter hooks to control bycatch off George's Bank is not likely to make a bit of difference to the waters of the Galapagos. Rather than continue to focus on discrete, geographically bounded bodies of water, ocean advocate and marine-policy researcher Deborah Wright urges a Plan Sea, which reimagines the oceans as the continuous ecosystem it is, not disconnected buckets of salt and plankton.

This book proposes that the global marine environment be protected under the precautionary principle. It argues that the policy framework for such protection already exists—it just needs to be enforced. In a series of case studies, with first-person vignettes woven throughout, Wright encourages us to begin every conversation about ocean policy with the assumption that any extractive or polluting activities in the world's oceans should require special permission. Her argument invokes the Public Trust Doctrine already embedded in many constitutions, and hinges on the Law of the Sea, which was established by the U.N. in 1982 to protect the "high seas," or the remote parts of the ocean considered international waters. To some, Wright's plan may seem idealistic, but its audacity might also be seen as a welcome nudge to our collective imagination. Many scientists are convinced that ocean ecosystems are on the brink of collapse—there's something to be said, then, for a book that's radical enough to unlock new thinking about what might be possible, and maybe necessary, in terms of their protection.



University of Chicago Press October 2020

A SERIES OF FORTUNATE EVENTS: Chance and the Making of

the Planet, Life, and You

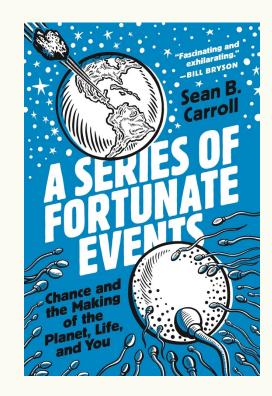
Sean B. Carroll

Why is the world the way it is? How did we get here? Does everything happen for a reason or are some things left to chance? Philosophers and theologians have pondered these questions for millennia, but startling scientific discoveries over the past half century are revealing that we live in a world driven by chance. A SERIES OF FORTUNATE EVENTS tells the story of the awesome power of chance and how it is the surprising source of all the beauty and diversity in the living world.

Like every other species, we humans are here by accident. But it is shocking just how many things—any of which might never have occurred—had to happen in certain ways for any of us to exist. From an extremely improbable asteroid impact, to the wild gyrations of the Ice Age, to invisible accidents in our parents' gonads, we are all here through an astonishing series of fortunate events. And chance continues to reign every day over the razor-thin line between our life and death.

This is a relatively small book about a really big idea. It is also a spirited tale. Drawing inspiration from Monty Python, Kurt Vonnegut, and other great thinkers, and crafted by one of today's most accomplished science storytellers, A SERIES OF FORTUNATE EVENTS is an irresistibly entertaining and thought-provoking account of one of the most important but least appreciated facts of life.

Rights sold to: Chinese Simplified (Cheers), Italian (Codice), Korean (Cocoon Books), Polish (Zysk), Portuguese (Saida de Emergencia), Spanish (Debate) and Turkish (Orenda).



Princeton University Press October 2020

GREAT ADAPTATIONS: Star-Nosed Moles, Electric Eels, and Other

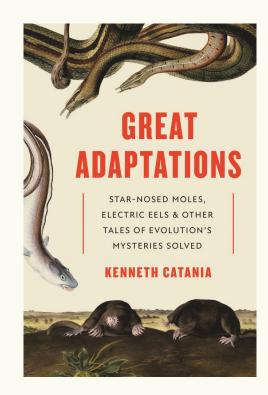
Tales of Evolution's Mysteries Solved

Kenneth Catania

From star-nosed moles that have super-sensing snouts to electric eels that paralyze their prey, animals possess unique and extraordinary abilities. In GREAT ADAPTATIONS, Kenneth Catania presents an entertaining and engaging look at some of nature's most remarkable creatures. Telling the story of his biological detective work, Catania sheds light on the mysteries behind the behaviors of tentacled snakes, tiny shrews, zombie-making wasps, and more. He shows not only how studying these animals can provide deep insights into how life evolved, but also how scientific discovery can be filled with adventure and fun.

Beginning with the star-nosed mole, Catania reveals what the creature's nasal star is actually for, and what this tells us about how brains work. He explores how the deceptive hunting strategy of tentacled snakes leads prey straight to their mouths, how eels use electricity to control other animals, and why emerald jewel wasps make zombies out of cockroaches. He also solves the enigma of worm grunting—a traditional technique in which earthworms are enticed out of the ground—by teaming up with professional worm grunters. Catania demonstrates the merits of approaching science with an open mind, considers the role played by citizen scientists, and illustrates that most animals have incredible, hidden abilities that defy our imagination.

Examining some strange and spectacular creatures, GREAT ADAPTATIONS offers a wondrous journey into nature's grand designs.



Princeton University Press September 2020

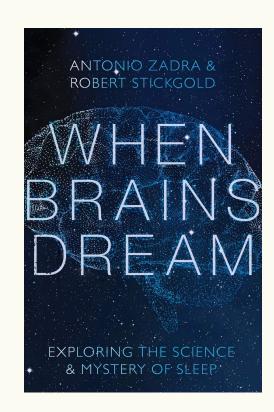
Rights sold to: Japan (Kagaku-Dojin Publishing Co.), Italy (Bollati Boringhieri Editore)

WHEN BRAINS DREAM: Exploring the Science and Mystery of Sleep Antonio Zadra and Robert Stickgold

Questions on the origins and meaning of dreams are as old as humankind, and as confounding and exciting today as when nineteenth-century scientists first attempted to unravel them. WHEN BRAINS DREAM addresses the core questions about dreams while illuminating the most up-to-date science in the field. Written by two world-renowned sleep and dream researchers, it debunks common myths—that we only dream in REM sleep, for example—while acknowledging the mysteries that persist around both the science and experience of dreaming.

Antonio Zadra and Robert Stickgold bring together state-of-the-art neuroscientific ideas and findings, and propose a new and innovative model of dream function called NEXTUP—Network Exploration to Understand Possibilities. By detailing this model's workings, they help readers understand key features of several types of dreams—from prophetic dreams to nightmares and lucid dreams—and explain everything from how dreams can facilitate creativity to why they can be a source of personal insight.

Rights sold to: Simplified Chinese (China Machine Press/Beijing Huazhang Graphics & Information), Korean (Chungrim Publishing Co. Ltd.), Japanese (Kinokuniya Shoten), Romanian (Humanitas), Polish (Insignis Media), Dutch (Uitgeverij Unieboek - Het Spectrum B.V.)



W.W. Norton January 2021

WHO'S AFRAID OF VACCINATIONS?

(new revised edition with a chapter dedicated to Covid-19) Andrea Grignolio

The dangerous decline in vaccinations in many developed countries is at the center of a lively debate which confirms how crucial this subject is today. Vaccinations are amongst the most important scientific discoveries for the human race, yet they continue to be considered with suspicion by part of public opinion, the victims of campaigns of disinformation, instrumentalization and unfounded fears. These irrational beliefs, however, have an evolutionary explanation, without which it will be difficult to solve the growing social opposition. This book, which throws light on to the safety and importance of vaccinations, is for both parents and those who want to understand the role of vaccinations in contemporary society, where the easy access to knowledge is both a great opportunity and a great responsibility. The chapters follow a historical narration and conclude with a discussion of the most recent cognitive theories to tackle this resistance to vaccinations.

Rights sold to: English (Springer), Slovene (Zalozba), Russian (Bombora/Eksmo), Estonian (Argo)



Codice Edizioni June 2021