

Weird Maths At The Edge Of Infinity And Beyond

Thinking Mathematically is perfect for anyone who wants to develop their powers to think mathematically, whether at school, at university or just out of interest. This book is invaluable for anyone who wishes to promote mathematical thinking in others or for anyone who has always wondered what lies at the core of mathematics. Thinking Mathematically reveals the processes at the heart of mathematics and demonstrates how to encourage and develop them. Extremely practical, it involves the reader in questions so that subsequent discussions speak to immediate experience.

Weird Maths is a lively, accessible, fun book about mathematics, the maths that is all around us, that defines us, our intelligence, our curiosity. In this delightful journey of discovery, David Darling and Agnijo Banerjee explore the cutting edge of modern maths and delve into some fascinating questions: Is anything truly random? Does infinity actually exist? Can maths help us understand chaos? Can chess be solved with maths? If there are aliens and if they play music, would we like it? Packed with puzzles and paradoxes, mind-bending concepts and surprising solutions, **Weird Maths** is a book for anyone who is interested in maths or in popular science.

Who is not so shocked by quantum theory has not understood it." Since Niels Bohr said this many years ago, quantum mechanics has only been getting more shocking. We now realize that it's not really telling us that "weird" things happen out of sight, on the tiniest level, in the atomic world; rather, everything is quantum. But if quantum mechanics is correct, what seems obvious and right in our everyday world is built on foundations that don't seem obvious or right at all—or even possible. An exhilarating tour of the contemporary quantum landscape, **Beyond Weird** is a book about what quantum physics really means—and what it doesn't. Science writer Philip Ball offers an up-to-date, accessible account of the quest to come to grips with the most fundamental theory of physical reality, and to explain how its counterintuitive principles underpin the world we experience. Over the past decade it has become clear that quantum physics is less a theory about particles and waves, uncertainty and fuzziness, than a theory about information and knowledge—about what can be known, and how we can know it. Discoveries and experiments over the past few decades have called into question the meanings and limits of space and time, cause and effect, and, ultimately, of knowledge itself. The quantum world **Ball** shows us isn't a different world. It is our world, and if anything deserves to be called "weird," it's us.

In his "provocative" book (New York Times), a contrarian physicist argues that her field's modern obsession with beauty has given us wonderful math but bad science. Whether pondering black holes or predicting discoveries at CERN, physicists believe the best theories are beautiful, natural, and elegant, and this standard separates popular theories from discredited ones. This is why, Sabine Hossenfelder argues, we have not seen a major breakthrough in the foundations of physics for more than four decades. The belief in beauty has become so dogmatic that it now conflicts with scientific objectivity: observation has been unable to confirm mindbending theories, like supersymmetry or grand unification, invented by physicists based on aesthetic criteria. Worse, these "too good to not be true" theories are actually untestable and they have left the field in a cul-de-sac. To escape, physicists must rethink their methods. Only by embracing reality as it is can science discover the truth.

Weirder Maths

My Quest for the Ultimate Nature of Reality Is That a Big Number?

The Weil Conjectures

Weirdest Maths

A Journey to the Edge of Mathematics

Posthuman Life

The Math of Life and Death

'Beguiling ... Olsson is evocative on curiosity as an appetite of the mind, on the pleasure of glutting oneself on knowledge' New York Times Simone Weil: philosopher, political activist, mystic - and sister to André, one of the most influential mathematicians of the twentieth century. These two extraordinary siblings formed an obsession for Karen Olsson, who studied mathematics at Harvard, only to turn to writing as a vocation. When Olsson got hold of the 1940 letters between the siblings, she found they shared a curiosity about the inception of creative thought - that flash of insight - that Olsson experienced as both a maths student, and later, novelist. Following this thread of connections, **The Weil Conjectures** explores the lives of Simone and André, the lore and allure of mathematics, and its significance in Olsson's own life.

This book is unique in that it looks at geometry from 4 different viewpoints - Euclid-style axioms, linear algebra, projective geometry, and groups and their invariants. Approach makes the subject accessible to readers of all mathematical tastes, from the visual to the algebraic. Am abundantly supplemented with figures and exercises.

****WINNER OF THE 2020 NOBEL PRIZE IN PHYSICS*** **The Road to Reality** is the most important and ambitious work of science for a generation. It provides nothing less than a comprehensive account of the physical universe and the essentials of its underlying mathematical theory. It assumes no particular specialist knowledge on the part of the reader, so that, for example, the early chapters give us the vital mathematical background to the physical theories explored later in the book. Roger Penrose's purpose is to describe as clearly as possible our present understanding of the universe and to convey a feeling for its deep beauty and philosophical implications, as well as its intricate logical interconnections. **The Road to Reality** is rarely less than challenging, but the book is leavened by vivid descriptive passages, as well as hundreds of hand-drawn diagrams. In a single work of colossal scope one of the world's greatest scientists has given us a complete and unrivalled guide to the glories of the universe that we all inhabit.

'Roger Penrose is the most important physicist to work in relativity theory except for Einstein. He is one of the very few people I've met in my life who, without reservation, I call a genius' Lee Smolin

An in-depth look at the lives, experiences, and professional careers of Black mathematicians in the United States. Erica N. Walker presents a compelling story of Black mathematical excellence in the United States. Much of the research and discussion about Blacks and mathematics focuses on underachievement; by documenting in detail the experiences of Black mathematicians, this book broadens significantly the knowledge base about mathematically successful African Americans. **Beyond Banneker** demonstrates how mathematics success is fostered among Blacks by mathematicians, mathematics educators, teachers, parents, and others, a story that has been largely overlooked by the profession and research community. Based on archival research and in-depth interviews with thirty mathematicians, this important and timely book vividly captures important narratives about mathematics teaching and learning in multiple contexts, as well as the unique historical and contemporary settings related to race, opportunity, and excellence that Black mathematicians experience. Walker draws upon these narratives to suggest ways to capitalize on the power and potential of underserved communities to respond to the national imperative for developing math success for new generations of young people.

A Teenage Genius and His Teacher Reveal the Strange Connections Between Math and Everyday Life

Beyond Infinity

How Big Data Increases Inequality and Threatens Democracy

A Guided Tour for Graduate Students

The Ten Equations That Rule the World

Humble Pi

The Universe Speaks in Numbers

Why Everything You Thought You Knew about Quantum Physics Is Different

New York Times bestseller • Life on the Edge alters our understanding of our world's fundamental dynamics through the use of quantum mechanics. Life is the most extraordinary phenomenon in the known universe; but how did it come to be? Even in an age of cloning and artificial biology, the remarkable truth remains: nobody has ever made anything living entirely out of dead material. Life remains the only way to make life. Are we still missing a vital ingredient in its creation? Using first-hand experience at the cutting edge of science, Jim Al-Khalili and Johnjoe Macfadden reveal that missing ingredient to be quantum mechanics. Drawing on recent ground-breaking experiments around the world, each chapter in **Life on the Edge** illustrates one of life's puzzles: How do migrating birds know where to go? How do we really smell the scent of a rose? How do our genes copy themselves with such precision? **Life on the Edge** accessibly reveals how quantum mechanics can answer these probing questions of the universe. Guiding the reader through the rapidly unfolding discoveries of the last few years, Al-Khalili and Macfadden describe the explosive new field of quantum biology and its potentially revolutionary applications, while offering insights into the biggest puzzle of all: what is life? As they brilliantly demonstrate in these groundbreaking pages, life exists on the quantum edge. Winner, Stephen Hawking Medal for Science Communication

"An engaging voyage into some of the great mysteries and wonders of our world." --Alan Lightman, author of Einstein's Dream and The Accidental Universe "No one is better at making the recondite accessible and exciting." --Bill Bryson Brain Pickings and Kirkus Best Science Book of the Year Every week seems to throw up a new discovery, shaking the foundations of what we know. But are these questions we will never be able to answer—mysteries that lie beyond the predictive powers of science? In this captivating exploration of our most tantalizing unknowns, Marcus du Sautoy invites us to consider the problems in cosmology, quantum physics, mathematics, and neuroscience that continue to bedevil scientists and creative thinkers who are at the forefront of their fields. At once exhilarating, mind-bending, and compulsively readable, **The Great Unknown** challenges us to consider big questions—about the nature of consciousness, what came before the big bang, and what lies beyond our horizons—while taking us on a virtuoso tour of the great breakthroughs of the past and celebrating the men and women who dared to tackle the seemingly impossible and had the imagination to come up with new ways of seeing the world.

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Oliver Sacks For six decades Erdos had no job, no hobbies, no wife, no home, he never learnt to cook, do laundry, drive a car and date a virgin. Instead he travelled the world with his mother in tow, arriving at the doorstep of esteemed mathematicians declaring 'My brain is open'. He travelled until his death at 83, racing across four continents to prove as many theorems as possible, fuelled by a diet of espresso and amphetamines. With more than 1,500 papers written or co-written.

Wow! This is a powerful book that addresses a long-standing elephant in the mathematics room. Many people learning math ask "Why is math so hard for me while everyone else understands it?" and "Am I good enough to succeed in math?" In answering these questions the book shares personal stories from many now-accomplished mathematicians affirming that "You are not alone, math is hard for everyone" and "Yes, you are good enough." Along the way the book addresses other issues such as biases and prejudices that mathematicians encounter, and it provides inspiration and emotional support for mathematicians ranging from the experienced professor to the struggling undergraduate.

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