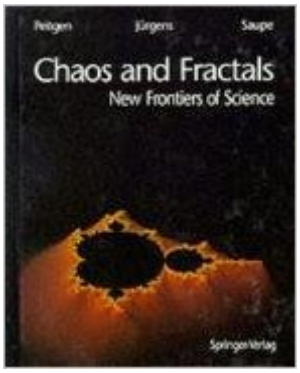
Chaos And Fractals: New Frontiers Of Science



Synopsis

For almost 15 years chaos and fractals have been riding a wave that has enveloped many areas of mathematics and the natural sciences in its power, creativity and expanse. Traveling far beyond the traditional bounds of mathematics and science to the distant shores of popular culture, this wave captures the attention and enthusiasm of a worldwide audience. The fourteen chapters of this book cover the central ideas and concepts of chaos and fractals as well as many related topics including: the Mandelbrot Set, Julia Sets, Cellulair Automata, L- systems, Percolation and Strange Attractors. Each chapter is closed by a "Program of the Chapter" which provides computer code for a central experiment. Two appendices complement the book. The first, by Yuval Fisher, discusses the details and ideas of fractal images and compression; the second, by Carl J.G. Evertsz and Benoit Mandelbrot, introduces the foundations and implications of multifractals.

Book Information

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Customer Reviews

I spent quite a bit of time looking for a good "fractals" book. For me, this is it. It is not a book for everyone, though. I'll try to offer guidelines to help you decide if it is for you. In summary: (a) its not just a picture book, but extremely visual, (b) its not math-intense but asks for math-comfort and offers options and (c) its not only for computer jockeys, but offers repeated links to that approach.This book is doubtless great for a high-school or college course in fractals. But I think it is also a worthy buy, albeit a pricey one, for a certain type of layperson with a fascination for mathematics presented in some depth. If you enjoy math but find some of the "popularizations" a bit

too shallow, then the realm of fractals and chaos is a great place to explore in depth. This is a fine guidebook for that exploration."Chaos and Fractals" is not a book for the reader who is primarily fascinated with the visual representations of fractals. BUT it i!s chock-full of b/w illustrations (686 by the authors count) and nicely sprinkled with gorgeous color plates. The visual element is not central, but is very strongly represented and I found that almost every important concept was enhanced by the addition of a diagram or illustration.This is definitely a book that delves into the mathematics of fractals. It does so in a well-crafted dual-track form. The core of the book should be comfortable and enjoyable mathematical reading for anyone with a sound and fairly current familiarity with high school math (Not that such "currency" suggests its only for youngsters! This old-timer preserves essentially that level of math by regular exposure to recreational math and the like). On the second track, the book provides mathematically in-depth views of selected topics.

I purchased this book when it first came out, during theinitial wave of popularity of fractals and chaos theory.Although the fadishness of chaos and fractals has dieddown, a number of solid applications for this theory haveappeared in areas like computer graphics, finance,modeling computer network traffic and data compression.I have purchased a number of books on fractals and chaos andhow these concepts can be applied in a number of areas. Ihave yet to see a better introduction to the topic. This isa core reference and I keep coming back to it again and again.In the spectrum of popular science books, this is definitelyon the technical end. You do not need an advanced backgroundin mathematics as you do for some books on chaos and fractals,but the authors do not shy away from equations. However, theideas are clearly presented. I have used this book as areference for developing software for fractal brownian motionand Hurst exponent estimation."Chaos and Fractals" covers a great deal of material. On a fewoccasions I found that the algorithms or explaination weredifficult to follow. In some cases, like the generation ofGaussian random numbers, I found better, simpler algorithms.When this book was written, fractals and chaos were fairly new.It is difficult to avoid comparing this book to an even thickerbook, "A New Kind of Science" by Stephen Wolfram. Althoughcellular automata, the core topic of "A New Kind of Science"are not exactly new, Wolfram claims new and profoundperspectives.

Wind: A Chaos Novel (The Chaos Series Book 1) Condensed Chaos: An Introduction to Chaos Magic New frontiers: Imperialism's new communities in East Asia, 1842-1953 (Studies in Imperialism MUP) The Brain That Changes Itself: Stories of Personal Triumph from the Frontiers of Brain Science Ageing Resource Communities: New frontiers of rural population change, community development and voluntarism (Routledge Studies in Human Geography) New Frontiers (Expansion Wars Trilogy, Book 1) Excelsior: Book 1 of the New Frontiers Series Mindscape: Book 2 of the New Frontiers Series Infinity: New Research Frontiers Turbulent Mirror: An Illustrated Guide to Chaos Theory and the Science of Wholeness Seven Life Lessons of Chaos: Spiritual Wisdom from the Science of Change Chaos Imagined: Literature, Art, Science Gaussian Self-Affinity and Fractals: Globality, The Earth, 1/f Noise, and R/S (Selected Works of Benoit B. Mandelbrot) Adult Coloring Book: Fractals: curves and geometric figures expertly programmed to help reduce stress, sharpen your concentration, and nourish your creativity Cities and Complexity: Understanding Cities with Cellular Automata, Agent-Based Models, and Fractals (MIT Press)