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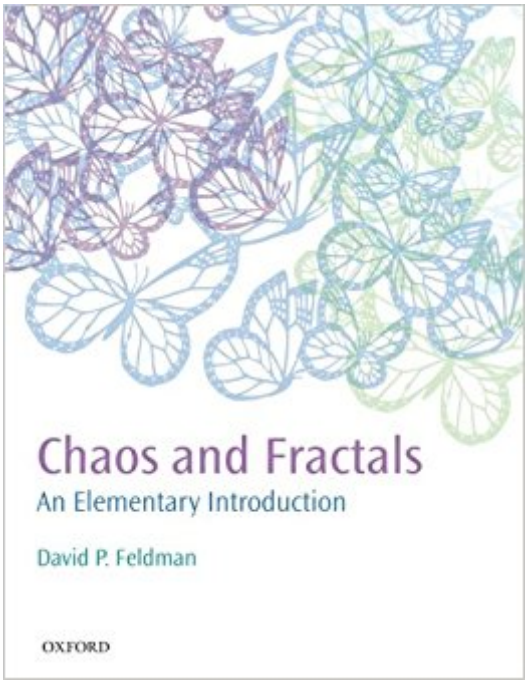
Chaos And Fractals: An Elementary Introduction



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Synopsis

This book provides the reader with an elementary introduction to chaos and fractals, suitable for students with a background in elementary algebra, without assuming prior coursework in calculus or physics. It introduces the key phenomena of chaos - aperiodicity, sensitive dependence on initial conditions, bifurcations - via simple iterated functions. Fractals are introduced as self-similar geometric objects and analyzed with the self-similarity and box-counting dimensions. After a brief discussion of power laws, subsequent chapters explore Julia Sets and the Mandelbrot Set. The last part of the book examines two-dimensional dynamical systems, strange attractors, cellular automata, and chaotic differential equations.The book is richly illustrated and includes over 200 end-of-chapter exercises. A flexible format and a clear and succinct writing style make it a good choice for introductory courses in chaos and fractals.To request a copy of the Solutions Manual, visit: http://global.oup.com/uk/academic/physics/admin/solutions

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Customer Reviews

"For the right audience and instructor, this is a wonderful book. With considerable effort on both sides it can take a wide audience with modest mathematics to a reasonable understanding of what is behind much of the complex phenomena seen in modern mathematical models of the physical universe." -- Thomas B. Ward, Durham University "There is a great deal to like about this book, starting with the author’s writing style, which I found particularly clear and enjoyable. ... All in all, this is a very valuable book. ... This is an excellent book and is highly recommended." --Mark Hunacek, MAA Reviews

A solutions manual is available for instructors.Ã Â Contact Oxford University Press or the author.

Ive read a bunch of Chaos and Fractals books, and this one is really the basic place to start Chaos and Fractals math. And now with Prof Feldman's online course (Complexity Explorer website) theres really no excuse to learn the subject anymore :). Very well done Prof. Feldman!. This is a great book and I really felt envy of Prof Feldman Students.Other book I really liked is Flake's Computational Beauty of Nature which you can read in parallel or after this one.

I have read many books on the subject. This one is the best. The author goes out of his way to explain things clearly. No matter how complex the topic, he does a great job explaining it with both words and graphics.

I can't believe how well writen this book is. There are paragraphs here I reread just for the shear pleasure of the language. I have never read another math book where such care was taken with the writing. If you want to know about Chaos and Fractals and you are an adult start here.

Interested in Fractals? Want to learn more? This is the book to get. An easy read with easy to understand diagrams and figures. A must have book for the fledgling learner.

Dr. Feldman is a genius. I read the book in 3 days and used it .

Chaos and Fractals is a clearly written back that presents the concepts of chaos and fractals using essentially high school algebra.The author concentrates on the classical iterated function systems: the logistic map. The hallmarks of chaos: a deterministic system with aperiodic bounded orbits and sensitive dependence on initial conditions are demonstrated. The introduction of fractals and different concepts of dimensions. There is an enjoyable discussion of Julia sets and the Mandelbrot set. The relationship between chaos and fractals is hinted at and there is a superficial introduction to differential equations.Overall this is, as the title expresses, an elementary introduction to these interesting topics.

So I was fortunate enough to take David Feldman's MOOC through the Santa Fe Institute on dynamical systems. He was just amazing in the course, one of the most likeable teachers I have

ever had. Dynamical systems (chaos and fractals are part of that, sort of, kind of), are not trivial to understand. Yet Dr. Feldman is such a master teacher that he makes it look easy and interesting, very interesting. The good news is that he writes like he teaches. This book gets into far more detail than the more popular titles by Gleik and others. It is not a tome like the ones targeted at math geniuses either. It is right in the middle, not too much, not too little, but just right. The middle bear of chaos. Feldman is as patient a writer as he is a teacher and will repeat himself in a masterful way to ensure you get the concept. He writing is approachable, just like he is. He is wicked smart, but does not need to rub it in your face. And he does not.The book is broad in its aim to give you a complete overview of chaos and fractals (dynamical systems) along with the math, but in a way that anyone can get it. This is a must have. His MOOC is a must take and he is a gift to the world of students. He is that rare teacher you never forget and always appreciate and his book is the same.

I enrolled in Dr. Feldman’s course at the Santa Fe Institute and enjoyed his class so much I purchased the book he had written. I am fascinated with the subject and his book provides lots of clarity.

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