

1. Record Nr.	UNINA9910792487403321
Autore	Peitgen Heinz-Otto
Titolo	Chaos and Fractals [[electronic resource]] : New Frontiers of Science // by Heinz-Otto Peitgen, Hartmut Jürgens, Dietmar Saupe
Pubbl/distr/stampa	New York, NY : , : Springer New York : , : Imprint : Springer, , 1992
ISBN	1-4757-4740-3
Edizione	[1st ed. 1992.]
Descrizione fisica	1 online resource (XXXII, 999 p.)
Classificazione	58F13 70K50
Disciplina	510
Soggetti	Mathematics Mathematics, general
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Introduction: Causality Principle, Deterministic Laws and Chaos -- 1 The Backbone of Fractals: Feedback and the Iterator -- 2 Classical Fractals and Self-Similarity -- 3 Limits and Self-Similarity -- 4 Length, Area and Dimension: Measuring Complexity and Scaling Properties -- 5 Encoding Images by Simple Transformations -- 6 The Chaos Game: How Randomness Creates Deterministic Shapes -- 7 Recursive Structures: Growing of Fractals and Plants -- 8 Pascal's Triangle: Cellular Automata and Attractors -- 9 Irregular Shapes: Randomness in Fractal Constructions -- 10 Deterministic Chaos: Sensitivity, Mixing, and Periodic Points -- 11 Order and Chaos: Period-Doubling and its Chaotic Mirror -- 12 Strange Attractors: The Locus of Chaos -- 13 Julia Sets: Fractal Basin Boundaries -- 14 The Mandelbrot Set: Ordering the Julia Sets -- A A Discussion of Fractal Image Compression -- A.1 Self-Similarity in Images -- A.2 A Special MRCM -- A.3 Encoding Images -- A.4 Ways to Partition Images -- A.5 Implementation Notes -- B Multifractal Measures -- B.1 Introduction -- B.2 The Binomial and Multinomial Measures -- B.5 Some Applications, and Advanced Multifractals.
Sommario/riassunto	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.
