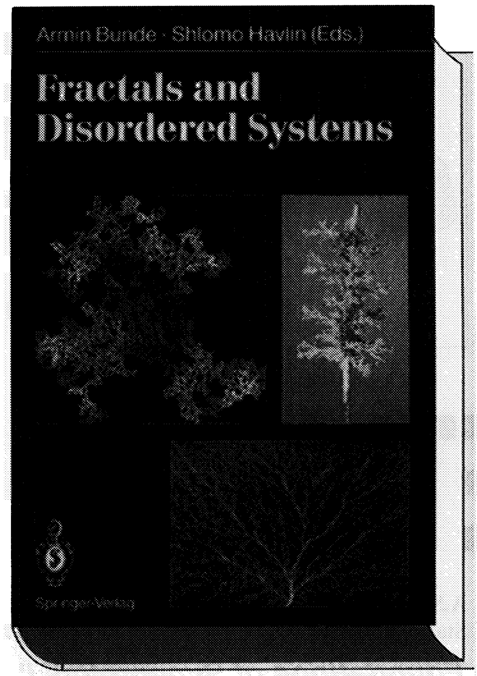

Fractals and disordered systems have recently become the focus of intense interest in research. This book discusses in great detail the effects of disorder on mesoscopic scales (fractures, aggregates, colloids, surfaces and interfaces, glasses, and polymers) and presents tools to describe them in mathematical language. A substantial part is devoted to the development of scaling theories based on fractal concepts. In 10 chapters written by leading experts in the field, including E. Stanley and B. Mandelbrot, the reader is introduced to basic concepts and techniques in disordered systems and is lead to the forefront of current research. In each chapter the connection between theory and experiment is emphasized, and a special chapter entitled "Fractals and Experiments" presents experimental studies of fractal systems in the laboratory.

The book is written pedagogically. It can be used as a textbook for graduate students, by university teachers to prepare courses and seminars, and by active scientists who want to become familiar with a fascinating new field.

A. Bunde, University of Hamburg, FRG;
S. Havlin, Bar Ilan University, Ramat Gan, Israel (Eds.)

Fractals and Disordered Systems

1991. XIV, 350 pp.
163 figs. 10 tabs.
Hardcover DM 88,-
ISBN 3-540-54070-9

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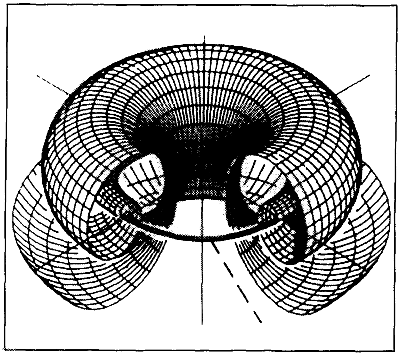

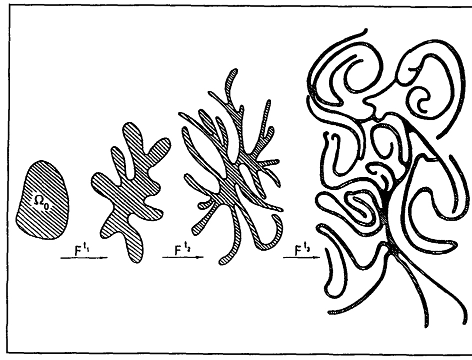

SYNERGETICS

A.S. Mikhailov, Moscow State University

Foundations of Synergetics I

Distributed Active Systems

1990. X, 187 pp. 68 figs. 5 tabs. (Springer Series in Synergetics, Vol. 51) Hardcover DM 110,-
ISBN 3-540-52775-3

This textbook presents an introduction to the mathematical theory of cooperative behavior in active systems of various origin, both natural and artificial. This volume (the first of two) is devoted to the properties of regular self-organized patterns in distributed active systems. An analysis of pattern formation and self-supported wave propagation in active media is followed by a description of the properties of neural networks and their possible applications in the field of distributed analog information processing. The volume ends with a discussion of reproductive networks and evolutionary systems. Attention is focused on basic models which might appear in a wide range of applications. As illustrations, the author uses simplified examples borrowed from a variety of disciplines ranging from chemical and biological physics to market economics.

A.S. Mikhailov, A.Yu. Loskutov, Moscow State University

Foundations of Synergetics II

Complex Patterns

1991. VIII, 210 pp. 98 figs. (Springer Series in Synergetics, Vol. 52) Hardcover DM 110,-
ISBN 3-540-53448-2

This book is the second of two volumes that together give a comprehensive introduction to the theory of cooperative behavior in active systems. This volume is devoted to the properties of the complex chaotic patterns that can arise in distributed active systems. The reader will encounter strange attractors, fractals, discrete maps, spatio-temporal chaos..., and will learn how these phenomena relate to the emergence of complex and chaotic patterns. Examples treated in detail include population explosion and extinction in fluctuating distributed media, and fluctuation effects in binary annihilation.

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Communications in

Mathematical Physics

Springer-Verlag: Berlin Heidelberg New York Tokyo Hong Kong Barcelona Budapest
Printers: Brühlsche Universitätsdruckerei, Giessen
Printed in Germany

Springer-Verlag GmbH & Co KG, 1000 Berlin 33, Federal Republic of Germany