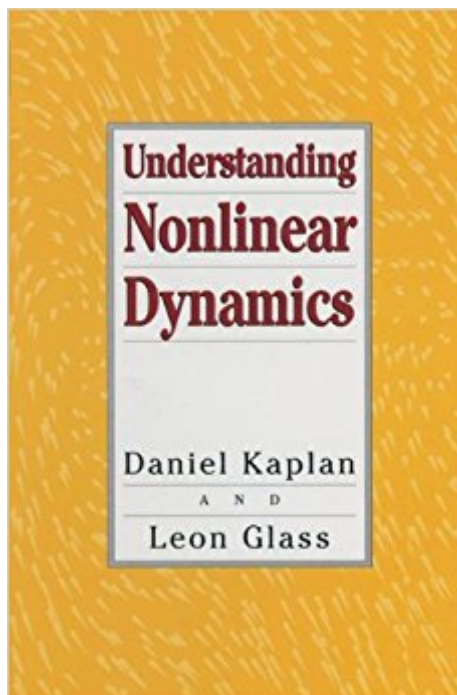




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Understanding Nonlinear Dynamics (Textbooks In Mathematical Sciences)



Synopsis

Mathematics is playing an ever more important role in the physical and biological sciences, provoking a blurring of boundaries between scientific disciplines and a resurgence of interest in the modern as well as the classical techniques of applied mathematics. This renewal of interest, both in research and teaching, has led to the establishment of the series: Texts in Applied Mathematics (TAM). The development of new courses is a natural consequence of a high level of excitement on the research frontier as newer techniques, such as numerical and symbolic computer systems, dynamical systems, and chaos, mix with and reinforce the traditional methods of applied mathematics. Thus, the purpose of this textbook series is to meet the current and future needs of these advances and encourage the teaching of new courses. TAM will publish textbooks suitable for use in advanced undergraduate and beginning graduate courses, and will complement the Applied Mathematical Sciences (AMS) series, which will focus on advanced textbooks and research level monographs.

About the Authors Daniel Kaplan specializes in the analysis of data using techniques motivated by nonlinear dynamics. His primary interest is in the interpretation of irregular physiological rhythms, but the methods he has developed have been used in geophysics, economics, marine ecology, and other fields. He joined McGill in 1991, after receiving his Ph.D from Harvard University and working at MIT. His undergraduate studies were completed at Swarthmore College. He has worked with several instrumentation companies to develop novel types of medical monitors.

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??Not only are many of the most recent topics included and simply explained, but the reader is also warned against difficulties in the practical implementation of the proposed methods of analysis and against common misinterpretations of some theoretical concepts. Because of its completeness and plain, but mathematically correct, style, this book is also an ideal starting point for researchers from various disciplines who are not familiar with mathematical concepts usually learned in the first two years of university study.?? ??MATHEMATICAL REVIEWS ??I recommend this book strongly both to those who need to teach these topics and to those who want to learn about them, whether or not they are in the biosciences. In fact, I would strongly recommend this book to paleontologists, paleobiologists, paleoecologists, and geologists who are (finally) becoming interested in nonlinear dynamics, but are still afraid to ask.????AMERICAN SCIENTIST ??[The authors] have written a readily accessible introduction to nonlinear dynamics??the book presents the main concepts and applications of nonlinear dynamics at an elementary level??Interspersed in the text are delightful short essays of a page or two each??Courses on nonlinear dynamics rarely present these topics at the level used in the book??It is written in a ??user friendly?? colloquial style and is a delight to read??no reader is likely to encounter a more accessible elementary introduction to nonlinear dynamics.????PHYSICS TODAYANot only are many of the most recent topics included and simply explained, but the reader is also warned against difficulties in the practical implementation of the proposed methods of analysis and against common misinterpretations of some theoretical concepts. Because of its completeness and plain, but mathematically correct, style, this book is also an ideal starting point for researchers from various disciplines who are not familiar with mathematical concepts usually learned in the first two years of university study.A

AMATHEMATICAL REVIEWS AI recommend this book strongly both to those who need to teach these topics and to those who want to learn about them, whether or not they are in the biosciences. In fact, I would strongly recommend this book to paleontologists, paleobiologists, paleoecologists, and geologists who are (finally) becoming interested in nonlinear dynamics, but are still afraid to ask.AAAMERICAN SCIENTIST A[The authors] have written a readily accessible introduction to nonlinear dynamicsAthe book presents the main concepts and applications of nonlinear dynamics at an elementary levelAInterspersed in the text are delightful short essays of a page or two eachACourses on nonlinear dynamics rarely present these topics at the level used in the bookAlt is written in a Auser friendlyA colloquial style and is a delight to readAno reader is likely to encounter a

more accessible elementary introduction to nonlinear dynamics. AAPHYSICS TODAY

It is funny that there is so much hype about Wolfram's "A New Kind of Science" when this book neatly pointed out his big 'discoveries' back in 1995. That is, all of Wolfram's opus can be found in chapter 2 of this book. The book provides a good (and relatively gentle) introduction to the mechanistic view of non-linear dynamics. Many different applications of non-linear dynamics, from physics to biology, are overviewed and many detailed examples are provided. In all, this is a great reference. The only shortcomings are the lack of discussions about frameworks, particularly mechanistic systems, and how they influence the applicability of the models. That is, some understanding of systems theory (von Bertalanffy in particular and the work of cybernetics as well) should have been included to point out the fact that the linear causality implied by many models immediately limits their applicability.

It happens that in any field there is a book that illuminates. This is the one in Nonlinear Dynamics. With its clear and simple but mathematically and conceptually rich presentation this text opens the mind towards the mathematics that you learn in your two first University years, as applied to innumerable Life Science examples, but at the same time interesting for any other field's applications (Physics, Maths, Chemists,...). This book deals with Dynamics in a Superb Way. Contents: 1-Finite Difference Equations. 2-Boolean Networks and Cellular Automata. 3-Self Similarity and Fractal Geometry. 4-One Dimensional Differential Equations. 5-Two Dimensional Differential Equations. 6-Time Series Analysis. Appendix-A: A Multifunctional Appendix. Appendix-B: A Note on Computer Notation. Buy it, you might learn how much you can do with your mathematics knowledge!

This is a gentle introduction to nonlinear dynamics, maths are well explained, illustrations are abundant, the overview is very good overall, even if subjects are only touched. It could also serve as an introduction to finite-difference and differential equations for non-maths students. Undergrads looking for something smooth on nonlinear dynamics should get this one...but for advanced readers it is probably a waste of time.

Excellent condition.

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