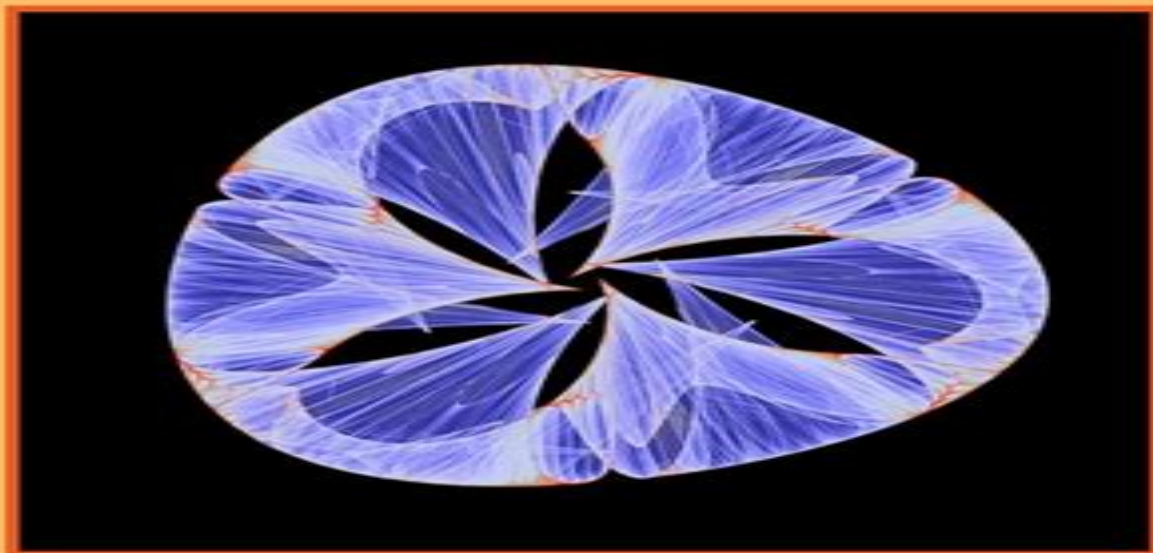


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With Applications to
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Steven H. Strogatz

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Applications of Chaos and Nonlinear Dynamics in Science and Engineering - Vol. 2 Santo Banerjee, Lamberto Rondoni, Mala Mitra, 2012-07-17 Chaos and nonlinear dynamics initially developed as a new emergent field with its foundation in physics and applied mathematics The highly generic interdisciplinary quality of the insights gained in the last few decades has spawned myriad applications in almost all branches of science and technology and even well beyond Wherever the quantitative modeling and analysis of complex nonlinear phenomena are required chaos theory and its methods can play a key role This second volume concentrates on reviewing further relevant contemporary applications of chaotic nonlinear systems as they apply to the various cutting edge branches of engineering This encompasses but is not limited to topics such as the spread of epidemics electronic circuits chaos control in mechanical devices secure communication and digital watermarking Featuring contributions from active and leading research groups this collection is ideal both as a reference work and as a recipe book full of tried and tested successful engineering applications *Applications of Chaos*

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including biological cognitive developmental social organizational and clinical psychology Each chapter provides an in depth examination of theoretical foundations and specific applications and a review of relevant methods This edited collection represents the state of the art in NDS science across the disciplines of psychology

An Introduction to Dynamical Systems and Chaos G.C. Layek, 2015-12-01 The book discusses continuous and discrete systems in systematic and sequential approaches for all aspects of nonlinear dynamics The unique feature of the book is its mathematical theories on flow bifurcations oscillatory solutions symmetry analysis of nonlinear systems and chaos theory The logically structured content and sequential orientation provide readers with a global overview of the topic A systematic mathematical approach has been adopted and a number of examples worked out in detail and exercises have been included Chapters 1-8 are devoted to continuous systems beginning with one dimensional flows Symmetry is an inherent character of nonlinear systems and the Lie invariance principle and its algorithm for finding symmetries of a system are discussed in Chap 8 Chapters 9-13 focus on discrete systems chaos and fractals Conjugacy relationship among maps and its properties are described with proofs Chaos theory and its connection with fractals Hamiltonian flows and symmetries of nonlinear systems are among the main focuses of this book Over the past few decades there has been an unprecedented interest and advances in nonlinear systems chaos theory and fractals which is reflected in undergraduate and postgraduate curricula around the world The book is useful for courses in dynamical systems and chaos nonlinear dynamics etc for advanced undergraduate and postgraduate students in mathematics physics and engineering

Nonlinear Dynamics and Chaos Steven Henry Strogatz, 2000 *Chaotic Dynamics of Nonlinear Systems* S. Neil Rasband, 2015-07-20 Written when the young science of chaos was gaining a foothold in the scientific community this book introduces the field's concepts applications theory and technique Suitable for advanced undergraduates and graduate students researchers and teachers of mathematics physics and engineering the text's major prerequisite is familiarity with differential equations and linear vector spaces Author S Neil Rasband discusses the major models for the transitions to chaos exhibited by dynamic systems introducing the classical topics and examples fundamental to the discipline The most important routes to chaos are presented within a unified framework and supported by integrated problem sets Topics include one and two dimensional maps universality theory fractal dimension differential and conservative dynamics and other subjects The text is supplemented by a helpful glossary references and an index

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