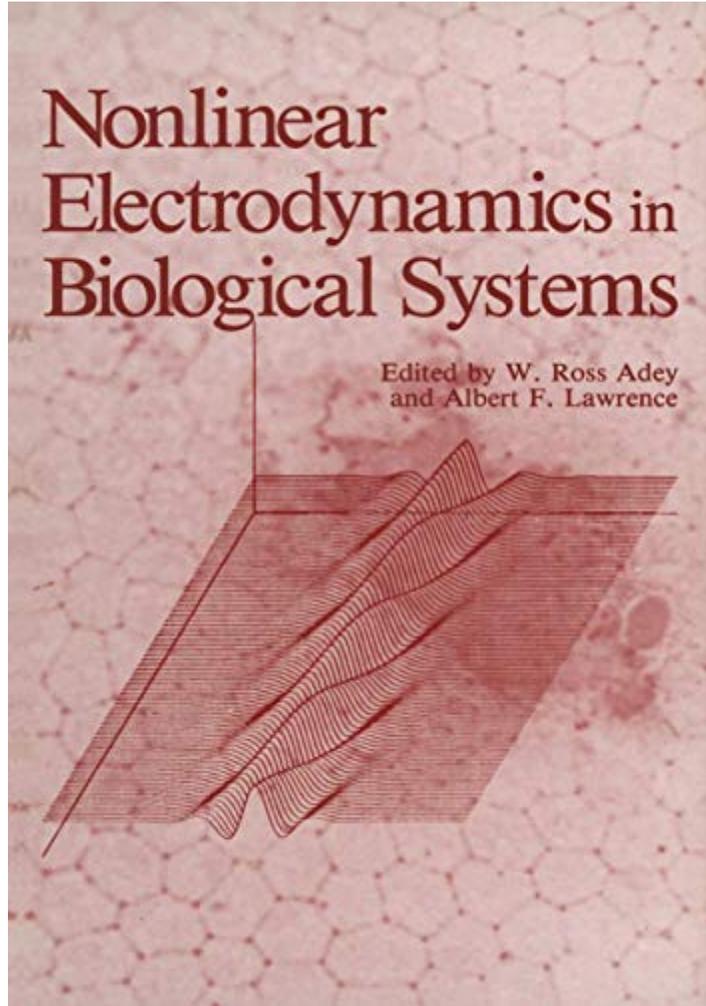


Nonlinear Electrodynamics in Biological Systems

Edited by W. Ross Adey
and Albert F. Lawrence



[MOBI] Nonlinear Electrodynamics In Biological Systems

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Nonlinear Electrodynamics in Biological Systems-W. Adey 2012-12-06

The past half century has seen an extraordinary growth in the fields of cellular and molecular biology. From simple morphological concepts of cells as the essential units of living matter there has been an ever-sharper focus on functional organization of living systems, with emphasis on molecular dynamics. Thus, life forms have come to be defined increasingly in terms of metabolism, growth, reproduction and responses to environmental perturbations. Since these properties occur in varying degrees in systems below the level of cellular organization, there has been a blurring of older models that restricted the concepts of life to cellular systems. At the same time, a search has begun for elemental aspects of molecular and atomic behavior that might better define properties common to all life forms. This search has led to an examination of nonlinear behavior in biological macromolecules, whether in response to electrical or chemical stimulation, for example, or as a means of signaling along a molecular chain, or as a means of energy transfer. Experimental knowledge in this area has grown rapidly in the past decade, and in some respects has outstripped theoretical models adequate to explain these new observations. Nevertheless, it can be claimed that there is now an impressive body of experiments implicating nonlinear, nonequilibrium processes as fundamental steps in sequential operations of biological systems.

Los Alamos Science- 1984

Regulation and Control Mechanisms in Biological Systems-

Vishnampet S. Vaidhyanathan 1993 A look at biological control systems covers thermodynamics, homeostatic systems, stationary states, biochemical control mechanisms, nonlinear nonequilibrium thermodynamics, and rhythmic phenomena in biology

Biological Systems: Nonlinear Dynamics Approach-Jorge Carballido-

Landeira 2019-04-29 This book collects recent advances in the field of nonlinear dynamics in biological systems. Focusing on medical applications as well as more fundamental questions in biochemistry, it presents recent findings in areas such as control in chemically driven reaction-diffusion systems, electrical wave propagation through heart tissue, neural network growth, chiral symmetry breaking in polymers and mechanochemical pattern formation in the cytoplasm, particularly in the context of cardiac cells. It is a compilation of works, including contributions from international scientists who attended the "2nd BCAM Workshop on Nonlinear Dynamics in Biological Systems," held at the Basque Center for Applied Mathematics, Bilbao in September 2016. Embracing diverse disciplines and using multidisciplinary approaches - including theoretical concepts, simulations and experiments - these contributions highlight the nonlinear nature of biological systems in order to be able to reproduce their complex behavior.

such areas as artificial networks, adaptive systems, classifier systems, connectionist learning, other learning, and biological networks to determine what properties are required of the supporting architectures that generate them. Many of the essays share the themes of design (how to construct such systems), the importance of preexisting structure to learning and the role of parallelism, and the tension between cooperative and competitive models of interaction. In the introduction, Stephanie Forrest presents several detailed examples of the kinds of problems emergent computation can address. These include showing how emergent computation can lead to efficiency improvements in parallel processing, establishing the connection between emergent computation and nonlinear systems, and comparing two search techniques to show how the emergent-computational approach to a problem differs from other more conventional approaches. Stephanie Forrest is Assistant Professor in the Department of Computer Science at the University of New Mexico. She is also affiliated with the Center for Nonlinear Studies and Computing Division at Los Alamos National Laboratory.

Studia biophysica- 1985

Images of the Twenty-first Century-IEEE Engineering in Medicine and Biology Society. Conference 1989

Proceedings of the National Academy of Sciences of the United States of America-National Academy of Sciences (U.S.) 1986 The Proceedings of the National Academy of Sciences (PNAS) publishes research reports, commentaries, reviews, colloquium papers, and actions of the Academy. PNAS is a multidisciplinary journal that covers the biological, physical, and social sciences.

Cancer Research- 1988

International Journal of Orthodontics- 1987

Advances in Membrane Fluidity, Membrane Transport and Information Storage-Roland C. Aloia 1990-02-12 This book is designed to be an authoritative evaluation of the energetics involved in the transfer of information from the membrane through the cell surface to the biochemical machinery within the cell. The book assesses the information contained within the architectural arrangement of the lipids, carbohydrates and proteins in the membrane and the release of this information to the membrane-bound and intracellular enzymes via stimuli from the external environment. This volume expertly reviews the concepts of membrane signal transduction and provides insights into the cascading events within the membrane that result from this signalling process, as well as the cellular response that follows.

The British National Bibliography-Arthur James Wells 1979

Current Catalog- 1988 First multi-year cumulation covers six years: 1965-70.

Optical and Hybrid Computing-Harold H. Szu 1987

Human Evolution- 1990

Energy Research Abstracts- 1986

Systems with Learning and Memory Abilities-Jean Delacour 1988 A comparison of the properties of various systems which have learning and memory abilities, this book is of a multidisciplinary nature. Artificial Intelligence specialists, mathematicians, physicists, biochemists,

neuroscientists and psychologists are among the contributors. Divided into five sections, the first considers learning and memory at the behavioral level, while the second is a continuation of this, dealing with neural bases. The third also illustrates a continuity, that between neurobiology and basic biology". The last two sections are both concerned with models of learning and memory, one inspired or constrained mainly by biological facts and the other by physics.

Phthalocyanines-Leznoff, C. C. (Clifford C.) 1989 Up-to-date and written by leading experts, this book is unique in a rapidly expanding field. It provides in-depth discussions and descriptions of the materials, electronic properties and applications of phthalocyanines. Aspects of phthalocyanines covered include * synthesis * polymer aspects * electronic spectroscopy * excited state chemistry and physics * chemical sensors * biological aspects (e.g. photodynamic therapy of cancer) The numerous tables, chemical structures, and references are particularly handy source materials for both the novice and experienced researcher and industrial practitioner interested in phthalocyanines.

Biophysics- 1991

Cultivating Consciousness-K. Ramakrishna Rao 1993 The authors discuss the nature of consciousness, the methods for studying it, its relevance to our values, and the role of consciousness for enhancing human abilities and wellness.

Molecular and Biomolecular Electronics-Chemical Congress of North America 1994 A comprehensive review of molecular and biomolecular electronics, the final stage in the miniaturization of computer circuitry that provides promising new methodologies for high speed signal processing and

communication, novel associative and neural architectures, and linear and nonlinear devices and memories. Includes coverage of quantum electronics, nanoscale semiconductor fabrication, genetic engineering, molecular biophysics, self-assembly, and nonlinear optics. Each chapter includes an overview of the fundamental methods and procedures followed by a review of recent research.

Government Reports Announcements & Index- 1985-05

Physics, Uspekhi- 1994

Directory of Published Proceedings- 1987

A Perspective Look at Nonlinear Media-Jürgen Parisi 1998-02-26 Concepts of nonlinear physics are applied to an increasing number of research disciplines. With this volume, the editors offer a selection of articles on nonlinear topics in progress, ranging from physics and chemistry to biology and some applications of social science. The book covers quantum optics, electron crystallization, cellular or flow patterns in fluids and in granular media, biological systems, and the control of brain structures via neuronal excitation. Chemical patterns are looked at both in bulk solutions and on surfaces in heterogeneous systems. From regular structures, the authors turn to the more complex behavior in biology and physics, such as hydrodynamical turbulence, low-dimensional dynamics in solid-state physics, and gravity.