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Nonlinear Problems in the Physical Sciences and Biology

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Nonlinear Problems In The Physical Sciences And Biology

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Nonlinear Problems in the Physical Sciences and Biology I. Stakgold, D. D. Joseph, D. H. Sattinger, 2014-01-15

Nonlinear Problems in the Physical Sciences and Biology I. Stakgold, D. D. Joseph, D. H. Sattinger, 2006-11-15

Nonlinear problems in the physical sciences and biology: proceedings of a Battelle Summer Institute, Seattle, July 3-28, 1972 Ivar Stackgold, Daniel D. Joseph, David H. Sattinger, 1973

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Eigenvalues of Non-Linear Problems G. Prodi, 2011-06-02 H Amann
Nonlinear eigenvalue problems in ordered Banach spaces P C Fife Branching phenomena in fluid dynamics and chemical reaction diffusion theory W Klingenberg The theory of closed geodesics P Rabinowitz Variational methods for nonlinear eigenvalue problems M Reeken Existence of solutions to the Hartree Fock equations R Turner Positive solutions of nonlinear eigenvalue problems

Nonlinear Parabolic and Elliptic Equations C.V. Pao, 2012-12-06 In response to the growing use of reaction diffusion problems in many fields this monograph gives a systematic treatment of a class of nonlinear parabolic and elliptic differential equations and their applications these problems It is an important reference for mathematicians and engineers as well as a practical text for graduate students

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

Differential Equations D. G. de Figueiredo, C. S. Hönig, 2006-11-15

Applied Analysis in Biological and Physical Sciences Jim M. Cushing, M. Saleem, H. M. Srivastava, Mumtaz Ahmad Khan, M. Merajuddin, 2016-12-01

The book contains recent developments and contemporary research in mathematical analysis and in its application to problems arising from the biological and physical sciences The book is of interest to readers who wish to learn of new research in such topics as linear and nonlinear analysis mathematical biology and ecology dynamical systems graph theory variational analysis and

inequalities functional analysis differential and difference equations partial differential equations approximation theory and chaos All papers were prepared by participants at the International Conference on Recent Advances in Mathematical Biology Analysis and Applications ICMBA 2015 held during 4-6 June 2015 in Aligarh India A focal theme of the conference was the application of mathematics to the biological sciences and on current research in areas of theoretical mathematical analysis that can be used as sophisticated tools for the study of scientific problems The conference provided researchers academicians and engineers with a platform that encouraged them to exchange their innovative ideas in mathematical analysis and its applications as well as to form interdisciplinary collaborations The content of the book is divided into three parts Part I contains contributions from participants whose topics are related to nonlinear dynamics and its applications in biological sciences Part II has contributions which concern topics on nonlinear analysis and its applications to a variety of problems in science engineering and industry Part III consists of contributions dealing with some problems in applied analysis

Growth Patterns in Physical Sciences and Biology Jaun-Manuel Garcia-Ruiz, Enrique Louis, P. Meakin, Leonard M. Sander, 2012-12-06 During the past decade interest in the formation of complex disorderly patterns far from equilibrium has grown rapidly This interest has been stimulated by the development of new approaches based primarily on fractal geometry to the quantitative description of complex structures increased understanding of non linear phenomena and the introduction of a variety of models such as the diffusion limited aggregation model that provide paradigms for non equilibrium growth phenomena Advances in computer technology have played a crucial role in both the experimental and theoretical aspects of this enterprise Substantial progress has been made towards the development of comprehensive understanding of non equilibrium growth phenomena but most of our current understanding is based on simple computer models Pattern formation processes are important in almost all areas of science and technology and clearly pattern growth pervades biology Very often remarkably similar patterns are found in quite diverse systems In some case dielectric breakdown electrodeposition fluid fluid displacement in porous media dissolution patterns and random dendritic growth for example the underlying causes of this similarity is quite well understood In other cases vascular trees nerve cells and river networks for example we do not yet know if a fundamental relationship exists between the mechanisms leading the formation of these structures

Bifurcation Theory and Applications Tian Ma, Shouhong Wang, 2005 Provides a comprehensive and intuitive review of existing bifurcation theories New theories for bifurcations from eigenvalues with even multiplicity General recipes for applications

Advances in Chemical Physics, Volume 32 Ilya Prigogine, Stuart A. Rice, 2009-09-08 The Advances in Chemical Physics series provides the chemical physics and physical chemistry fields with a forum for critical authoritative evaluations of advances in every area of the discipline Filled with cutting edge research reported in a cohesive manner not found elsewhere in the literature each volume of the Advances in Chemical Physics series serves as the perfect supplement to any advanced graduate class devoted to the study of chemical physics

Mathematical Modeling in Physical Sciences

Dimitrios Vlachos,2024-05-23 This volume gathers selected papers presented at the ICMSQUARE 2023 12th International Conference on Mathematical Modeling in Physical Sciences held in Belgrade Serbia from August 28 31 2023 This proceedings offers a compilation of cutting edge research which aims to advance the knowledge and development of high quality research in mathematical fields related to physics chemistry biology medicine economics environmental sciences and more Annually held since 2012 the ICMSQUARE conference serves as a platform for the exchange of ideas and discussions on the latest technological trends in these fields This book is an invaluable resource for researchers academicians and professionals in these areas seeking to stay up to date with the latest developments in mathematical modeling

Foundations Of Mechanics Ralph Abraham,2019-04-24 Foundations of Mechanics is a mathematical exposition of classical mechanics with an introduction to the qualitative theory of dynamical systems and applications to the two body problem and three body problem An Index and Other Useful Information A. Dold,B. Eckmann,2013-12-11 **Geometric Theory of Semilinear Parabolic Equations** Daniel Henry,2006-11-15 Analytical and Numerical Approaches to Asymptotic Problems in Analysis O. Axelsson,L.S. Frank,A. van der Sluis,2010-07-03 Analytical and Numerical Approaches to Asymptotic Problems in Analysis **Thermodynamics and Kinetics of Biological Processes** Ingolf Lamprecht,A. I. Zotin,2019-07-08 No detailed description available for Thermodynamics and Kinetics of Biological Processes **The Hopf Bifurcation and Its Applications** J. E. Marsden,M. McCracken,2012-12-06 The goal of these notes is to give a reasonably complete although not exhaustive discussion of what is commonly referred to as the Hopf bifurcation with applications to specific problems including stability calculations Historically the subject had its origins in the works of Poincaré around 1892 and was extensively discussed by Andronov and Witt and their co-workers starting around 1930 Hopf's basic paper appeared in 1942 Although the term Poincaré Andronov Hopf bifurcation is more accurate sometimes Friedrichs is also included the name Hopf Bifurcation seems more common so we have used it Hopf's crucial contribution was the extension from two dimensions to higher dimensions The principal technique employed in the body of the text is that of invariant manifolds The method of Ruelle-Takens is followed with details examples and proofs added Several parts of the exposition in the main text come from papers of P. Chernoff J. Dorroh O. Lanford and F. Weissler to whom we are grateful The general method of invariant manifolds is common in dynamical systems and in ordinary differential equations see for example Hale and Hartman Of course other methods are also available In an attempt to keep the picture balanced we have included samples of alternative approaches Specifically we have included a translation by L. Howard and N. Kopell of Hopf's original and generally unavailable paper **Psychological Undercurrents of History** Henry Lawton,Jerry S. Piven,2001 Psychological Undercurrents of History gathers together salient works of scholarship which endeavor to interpret the madness and imagination of our past from ancient religion to the Holocaust to Millennialism and Apocalyptic violence

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