Moving Interfaces And Quasilinear Parabolic Evolu

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Comprehending as well as conformity even more than other will provide each success. bordering to, the notice as competently as keenness of this moving interfaces and quasilinear parabolic evolu can be taken as without difficulty as picked to act.

Topics in Nonlinear Analysis Joachim Escher 2012-12-06 Herbert Amann's work is distinguished and marked by great lucidity and deep mathematical understanding. The present collection of 31 research papers, written by highly distinguished and accomplished mathematicians, reflect his interest and lasting influence in various fields of analysis such as degree and fixed point theory, nonlinear elliptic boundary value problems, abstract evolutions equations, quasi-linear parabolic systems, fluid dynamics, Fourier analysis, and the theory of function spaces. Contributors are A. Ambrosetti, S. Angenent, W. Arendt, M. Badiale, T. Bartsch, Ph. Bénilan, Ph. Clément, E. Faöangová, M. Fila, D. de Figueiredo, G. Gripenberg, G. Da Prato, E.N. Dancer, D. Daners, E. DiBenedetto, D.J. Diller, J. Escher, G.P. Galdi, Y. Giga, T. Hagen, D.D. Hai, M. Hieber, H. Hofer, C. Imbusch, K. Ito, P. Krejcí, S.-O. Londen, A. Lunardi, T. Miyakawa, P. Quittner, J. Prüss, V.V. Pukhnachov, P.J. Rabier, P.H. Rabinowitz, M. Renardy, B. Scarpellini, B.J. Schmitt, K. Schmitt, G. Simonett, H. Sohr, V.A. Solonnikov, J. Sprekels, M. Struwe, H. Triebel, W. von Wahl, M. Wiegner, K. Wysocki, E. Zehnder and S. Zheng.

Moving Interfaces and Quasilinear Parabolic Evolution Equations Jan Prüss 2016-07-25 In this monograph, the authors develop a comprehensive approach for the mathematical analysis of a wide array of problems involving moving interfaces. It includes an in-depth study of abstract quasilinear parabolic evolution equations, elliptic and parabolic boundary value problems, transmission problems, one- and two-phase Stokes problems, and the equations of incompressible viscous one- and two-phase fluid flows. The theory of maximal regularity, an essential element, is also fully developed. The authors present a modern approach based on powerful tools in classical analysis, functional analysis, and vector-valued harmonic analysis. The theory is applied to problems in two-phase fluid dynamics and phase transitions, one-phase generalized Newtonian fluids, nematic liquid crystal flows, Maxwell-Stefan diffusion, and a variety of geometric evolution equations. The book also includes a discussion of the underlying physical and thermodynamic principles

governing the equations of fluid flows and phase transitions, and an exposition of the geometry of moving hypersurfaces.

Mathematical Analysis of the Navier-Stokes Equations Matthias Hieber 2020-04-28 This book collects together a unique set of articles dedicated to several fundamental aspects of the Navier–Stokes equations. As is well known, understanding the mathematical properties of these equations, along with their physical interpretation, constitutes one of the most challenging questions of applied mathematics. Indeed, the Navier-Stokes equations feature among the Clay Mathematics Institute's seven Millennium Prize Problems (existence of global in time, regular solutions corresponding to initial data of unrestricted magnitude). The text comprises three extensive contributions covering the following topics: (1) Operator-Valued H∞-calculus, R-boundedness, Fourier multipliers and maximal Lp-regularity theory for a large, abstract class of quasi-linear evolution problems with applications to Navier–Stokes equations and other fluid model equations; (2) Classical existence, uniqueness and regularity theorems of solutions to the Navier–Stokes initial-value problem, along with space-time partial regularity and investigation of the smoothness of the Lagrangean flow map; and (3) A complete mathematical theory of R-boundedness and maximal regularity with applications to free boundary problems for the Navier–Stokes equations with and without surface tension. Offering a general mathematical framework that could be used to study fluid problems and, more generally, a wide class of abstract evolution equations, this volume is aimed at graduate students and researchers who want to become acquainted with fundamental problems related to the Navier–Stokes equations.

Geometric Sturmian Theory of Nonlinear Parabolic Equations and Applications Victor A. Galaktionov 2004-05-24 Unlike the classical Sturm theorems on the zeros of solutions of second-order ODEs, Sturm's evolution zero set analysis for parabolic PDEs did not attract much attention in the 19th century, and, in fact, it was lost or forgotten for almost a century. Briefly revived by Pólya in the 1930's and rediscovered in part several times since, it was not until the 1980's that the Sturmian argument for PDEs began to penetrate into the theory of parabolic equations and was found to have several fundamental applications. Geometric Sturmian Theory of Nonlinear Parabolic Equations and Applications focuses on geometric aspects of the intersection comparison for nonlinear models creating finite-time singularities. After introducing the original Sturm zero set results for linear parabolic equations and the basic concepts of geometric analysis, the author presents the main concepts and regularity results of the geometric intersection theory (G-theory). Here he considers the general singular equation and presents the geometric notions related to the regularity and interface propagation of solutions. In the general setting, the author describes the main aspects of the ODE-PDE duality, proves existence and nonexistence theorems, establishes uniqueness and optimal Bernstein-type estimates, and derives interface equations, including higher-order equations. The final two chapters explore some special aspects of discontinuous and continuous limit semigroups generated by singular parabolic equations. Much of the information presented here has never before been

published in book form. Readable and self-contained, this book forms a unique and outstanding reference on second-order parabolic PDEs used as models for a wide range of physical problems.

Motion of a Drop in an Incompressible Fluid I. V. Denisova 2021-09-20 This mathematical monograph details the authors' results on solutions to problems governing the simultaneous motion of two incompressible fluids. Featuring a thorough investigation of the unsteady motion of one fluid in another, researchers will find this to be a valuable resource when studying non-coercive problems to which standard techniques cannot be applied. As authorities in the area, the authors offer valuable insight into this area of research, which they have helped pioneer. This volume will offer pathways to further research for those interested in the active field of free boundary problems in fluid mechanics, and specifically the two-phase problem for the Navier-Stokes equations. The authors’ main focus is on the evolution of an isolated mass with and without surface tension on the free interface. Using the Lagrange and Hanzawa transformations, local well-posedness in the Hölder and Sobolev–Slobodeckij on L2 spaces is proven as well. Global well-posedness for small data is also proven, as is the well-posedness and stability of the motion of two phase fluid in a bounded domain. Motion of a Drop in an Incompressible Fluid will appeal to researchers and graduate students working in the fields of mathematical hydrodynamics, the analysis of partial differential equations, and related topics.

R-Boundedness, Fourier Multipliers and Problems of Elliptic and Parabolic Type Robert Denk 2003 The property of maximal L_p-regularity for parabolic evolution equations is investigated via the concept of $\mathcal R$-sectorial operators and operator-valued Fourier multipliers. As application, we consider the L_q-realization of an elliptic boundary value problem of order $2m$ with operator-valued coefficients subject to general boundary conditions. We show that there is maximal L_p-L_q-regularity for the solution of the associated Cauchy problem provided the top order coefficients are bounded and uniformly continuous.

Geometric Curve Evolution and Image Processing Frédéric Cao 2003-02-27 In image processing, "motions by curvature" provide an efficient way to smooth curves representing the boundaries of objects. In such a motion, each point of the curve moves, at any instant, with a normal velocity equal to a function of the curvature at this point. This book is a rigorous and self-contained exposition of the techniques of "motion by curvature". The approach is axiomatic and formulated in terms of geometric invariance with respect to the position of the observer. This is translated into mathematical terms, and the author develops the approach of Olver, Sapiro and Tannenbaum, which classifies all curve evolution equations. He then draws a complete parallel with another axiomatic approach using level-set methods: this leads to generalized curvature motions. Finally, novel, and very accurate, numerical schemes are proposed allowing one to compute the solution of highly degenerate evolution equations in a completely invariant way. The convergence of this scheme is also proved.

Nonlinear Partial Differential Equations for Future Applications Shigeaki Koike 2021-04-16 This volume features selected, original, and peer-reviewed papers on topics from a series of workshops on Nonlinear Partial Differential Equations for Future Applications that were held in 2017 at Tohoku University in Japan. The contributions address an abstract maximal regularity with applications to parabolic equations, stability, and bifurcation for viscous compressible Navier–Stokes equations, new estimates for a compressible Gross–Pitaevskii–Navier–Stokes system, singular limits for the Keller–Segel system in critical spaces, the dynamic programming principle for stochastic optimal control, two kinds of regularity machineries for elliptic obstacle problems, and new insight on topology of nodal sets of high-energy eigenfunctions of the Laplacian. This book aims to exhibit various theories and methods that appear in the study of nonlinear partial differential equations.

Moving Interfaces and Quasilinear Parabolic Evolution Equations Jan Prüss 2018-06-07 In this monograph, the authors develop a comprehensive approach for the mathematical analysis of a wide array of problems involving moving interfaces. It includes an in-depth study of abstract quasilinear parabolic evolution equations, elliptic and parabolic boundary value problems, transmission problems, one- and two-phase Stokes problems, and the equations of incompressible viscous one- and two-phase fluid flows. The theory of maximal regularity, an essential element, is also fully developed. The authors present a modern approach based on powerful tools in classical analysis, functional analysis, and vector-valued harmonic analysis. The theory is applied to problems in two-phase fluid dynamics and phase transitions, one-phase generalized Newtonian fluids, nematic liquid crystal flows, Maxwell-Stefan diffusion, and a variety of geometric evolution equations. The book also includes a discussion of the underlying physical and thermodynamic principles governing the equations of fluid flows and phase transitions, and an exposition of the geometry of moving hypersurfaces.

Exact Solutions and Invariant Subspaces of Nonlinear Partial Differential Equations in Mechanics and Physics Victor A. Galaktionov 2006-11-02 Exact Solutions and Invariant Subspaces of Nonlinear Partial Differential Equations in Mechanics and Physics is the first book to provide a systematic construction of exact solutions via linear invariant subspaces for nonlinear differential operators. Acting as a guide to nonlinear evolution equations and models from physics and mechanics, the book focuses on the existence of new exact solutions on linear invariant subspaces for nonlinear operators and their crucial new properties. This practical reference deals with various partial differential equations (PDEs) and models that exhibit some common nonlinear invariant features. It begins with classical as well as more recent examples of solutions on invariant subspaces. In the remainder of the book, the authors develop several techniques for constructing exact solutions of various nonlinear PDEs, including reaction-diffusion and gas dynamics models, thin-film and Kuramoto-Sivashinsky equations, nonlinear dispersion (compacton) equations, KdV-type and Harry Dym models, quasilinear magma equations, and Green-Naghdi equations. Using exact solutions, they describe the evolution properties of blow-up or

extinction phenomena, finite interface propagation, and the oscillatory, changing sign behavior of weak solutions near interfaces for nonlinear PDEs of various types and orders. The techniques surveyed in Exact Solutions and Invariant Subspaces of Nonlinear Partial Differential Equations in Mechanics and Physics serve as a preliminary introduction to the general theory of nonlinear evolution PDEs of different orders and types.

Linear and Quasilinear Parabolic Problems Herbert Amann 2019-04-16 This volume discusses an in-depth theory of function spaces in an Euclidean setting, including several new features, not previously covered in the literature. In particular, it develops a unified theory of anisotropic Besov and Bessel potential spaces on Euclidean corners, with infinite-dimensional Banach spaces as targets. It especially highlights the most important subclasses of Besov spaces, namely Slobodeckii and Hölder spaces. In this case, no restrictions are imposed on the target spaces, except for reflexivity assumptions in duality results. In this general setting, the author proves sharp embedding, interpolation, and trace theorems, point-wise multiplier results, as well as Gagliardo-Nirenberg estimates and generalizations of Aubin-Lions compactness theorems. The results presented pave the way for new applications in situations where infinite-dimensional target spaces are relevant – in the realm of stochastic differential equations, for example.

Waves in Flows Tomáš Bodnár 2021-05-04 This volume explores a range of recent advances in mathematical fluid mechanics, covering theoretical topics and numerical methods. Chapters are based on the lectures given at a workshop in the summer school Waves in Flows, held in Prague from August 27-31, 2018. A broad overview of cutting edge research is presented, with a focus on mathematical modeling and numerical simulations. Readers will find a thorough analysis of numerous state-of-the-art developments presented by leading experts in their respective fields. Specific topics covered include: Chemorepulsion Compressible Navier-Stokes systems Newtonian fluids Fluid-structure interactions Waves in Flows: The 2018 Prague-Sum Workshop Lectures will appeal to post-doctoral students and scientists whose work involves fluid mechanics.

Fundamental Contributions to the Continuum Theory of Evolving Phase Interfaces in Solids John M. Ball 2012-12-06 A traditional way to honor distinguished scientists is to combine collections of papers solicited from friendly colleagues into dedicatory volumes. To honor our friend and colleague Mort Gurtin on the occasion of his sixty-fifth birthday, we followed a surer path to produce a work of intrinsic and lasting scientific value: We collected pa pers that we deemed seminal in the field of evolving phase interfaces in solids, a field to which Mort Gurtin himself has made fundamental contributions. Our failure for lack of space to include in this volume every paper of major significance is mitigated by the ma gisterial introduction prepared by Eliot Fried, which assesses the contributions of nu merous works. We hope that this collection will prove useful and stimulating to both researchers and students in this exciting field. August 1998 JohnM. Ball David Kinderlehrer Paulo Podio-Guidugli Marshall Slemrod Contents Introduction: Fifty Years of Research on

Evolving Phase Interfaces By Eliot Fried. 0 •• 0 ••••• 1 I. Papers on Materials Science Surface Tension as a Motivation for Sintering By C. Herring 33 Two-Dimensional Motion of Idealized Grain Boundaries By W. W. Mullins 0 ••••••••••• 0 •••••••••••••••••• 70 Morphological. Stability of a Particle Growing by Diffusion or Heat Flow By w. w. Mullins and R. F. Sekerka 75 Energy Relations and the Energy-Momentum Tensor in Continuum Mechanics By J. D. Eshelby 82 The Interactions of Composition and Stress in Crystalline Solids By F. e. Larche and 1. W. Cahn 120 II.

Mathematical Reviews 2001

Mathematical Fluid Dynamics, Present and Future Yoshihiro Shibata 2016-12-01 This volume presents original papers ranging from an experimental study on cavitation jets to an up-to-date mathematical analysis of the Navier-Stokes equations for free boundary problems, reflecting topics featured at the International Conference on Mathematical Fluid Dynamics, Present and Future, held 11–14 November 2014 at Waseda University in Tokyo. The contributions address subjects in one- and two-phase fluid flows, including cavitation, liquid crystal flows, plasma flows, and blood flows. Written by internationally respected experts, these papers highlight the connections between mathematical, experimental, and computational fluid dynamics. The book is aimed at a wide readership in mathematics and engineering, including researchers and graduate students interested in mathematical fluid dynamics.

The Navier-Stokes Equations Hermann Sohr 2013-11-27 This book offers an elementary, self-contained approach to the mathematical theory of viscous, incompressible fluid in a domain of the Euclidian space, described by the equations of Navier-Stokes. It is the first to provide a systematic treatment of the subject. It is designed for students familiar with basic tools in Hilbert and Banach spaces, but fundamental properties of, for example, Sobolev spaces, are collected in the first two chapters.

Exact Solutions and Invariant Subspaces of Nonlinear Partial Differential Equations in Mechanics and Physics Victor A. Galaktionov 2006-11-02 Exact Solutions and Invariant Subspaces of Nonlinear Partial Differential Equations in Mechanics and Physics is the first book to provide a systematic construction of exact solutions via linear invariant subspaces for nonlinear differential operators. Acting as a guide to nonlinear evolution equations and models from physics and mechanics, the book focuses on the existence of new exact solutions on linear invariant subspaces for nonlinear operators and their crucial new properties. This practical reference deals with various partial differential equations (PDEs) and models that exhibit some common nonlinear invariant features. It begins with classical as well as more recent examples of solutions on invariant subspaces. In the remainder of the book, the authors develop several techniques for constructing exact solutions of various nonlinear PDEs, including reaction-diffusion and gas dynamics models, thin-film and Kuramoto-Sivashinsky equations, nonlinear dispersion (compacton) equations, KdV-type and

Harry Dym models, quasilinear magma equations, and Green-Naghdi equations. Using exact solutions, they describe the evolution properties of blow-up or extinction phenomena, finite interface propagation, and the oscillatory, changing sign behavior of weak solutions near interfaces for nonlinear PDEs of various types and orders. The techniques surveyed in Exact Solutions and Invariant Subspaces of Nonlinear Partial Differential Equations in Mechanics and Physics serve as a preliminary introduction to the general theory of nonlinear evolution PDEs of different orders and types.

Geometric Sturmian Theory of Nonlinear Parabolic Equations and Applications Victor A. Galaktionov 2004-05-24 Unlike the classical Sturm theorems on the zeros of solutions of second-order ODEs, Sturm's evolution zero set analysis for parabolic PDEs did not attract much attention in the 19th century, and, in fact, it was lost or forgotten for almost a century. Briefly revived by Plya in the 1930's and rediscovered in part several times since, it was not un

Navier-Stokes Equations and Related Nonlinear Problems 2020-05-18

Non-resonant Solutions in Hyperbolic-Parabolic Systems with Periodic Forcing Aday Celik 2020-09-30 This thesis is a mathematical investigation of damping effects in hyperbolic systems. In the first part two models from nonlinear acoustics are studied. Existence of time-periodic solutions to the Blackstock-Crighton equation and the Kuznetsov equation are established for time-periodic data sufficiently restricted in size. This leads to the conclusion that the dissipative effects in these models are sufficient to avoid resonance. In the second part the interaction of a viscous fluid with an elastic structure is studied. A periodic cell structure filled with a viscous fluid interacting with a deformable boundary of the cell is considered under time-periodic forcing. The motion of the fluid is governed by the Navier-Stokes equations and the deformable boundary is governed by the plate equation. It is shown that the damping mechanism induced by the viscous fluid is sufficient to avoid resonance in the elastic structure.

Phase Transitions and Hysteresis Augusto Visintin 2006-11-15 1) Phase Transitions, represented by generalizations of the classical Stefan problem. This is studied by Kenmochi and Rodrigues by means of variational techniques. 2) Hysteresis Phenomena. Some alloys exhibit shape memory effects, corresponding to a stress-strain relation which strongly depends on temperature; mathematical physical aspects are treated in Müller's paper. In a general framework, hysteresis can be described by means of hysteresis operators in Banach spaces of time dependent functions; their properties are studied by Brokate. 3) Numerical analysis. Several models of the phenomena above can be formulated in terms of nonlinear parabolic equations. Here Verdi deals with the most updated approximation techniques.

Nonlinear Evolution Equations and Related Topics Wolfgang Arendt 2004-08-20 Philippe Bénilan was a most original and charismatic mathematician who had a deep and decisive impact on the theory of Nonlinear Evolution Equations.

Dedicated to him, Nonlinear Evolution Equations and Related Topics contains research papers written by highly distinguished mathematicians. They are all related to Philippe Benilan's work and reflect the present state of this most active field. The contributions cover a wide range of nonlinear and linear equations.

Geometric Partial Differential Equations - Part I 2020-01-14 Besides their intrinsic mathematical interest, geometric partial differential equations (PDEs) are ubiquitous in many scientific, engineering and industrial applications. They represent an intellectual challenge and have received a great deal of attention recently. The purpose of this volume is to provide a missing reference consisting of self-contained and comprehensive presentations. It includes basic ideas, analysis and applications of state-of-the-art fundamental algorithms for the approximation of geometric PDEs together with their impacts in a variety of fields within mathematics, science, and engineering. About every aspect of computational geometric PDEs is discussed in this and a companion volume. Topics in this volume include stationary and time-dependent surface PDEs for geometric flows, large deformations of nonlinearly geometric plates and rods, level set and phase field methods and applications, free boundary problems, discrete Riemannian calculus and morphing, fully nonlinear PDEs including Monge-Ampere equations, and PDE constrained optimization Each chapter is a complete essay at the research level but accessible to junior researchers and students. The intent is to provide a comprehensive description of algorithms and their analysis for a specific geometric PDE class, starting from basic concepts and concluding with interesting applications. Each chapter is thus useful as an introduction to a research area as well as a teaching resource, and provides numerous pointers to the literature for further reading The authors of each chapter are world leaders in their field of expertise and skillful writers. This book is thus meant to provide an invaluable, readable and enjoyable account of computational geometric PDEs

A Stability Technique for Evolution Partial Differential Equations Victor A. Galaktionov 2012-12-06 * Introduces a state-of-the-art method for the study of the asymptotic behavior of solutions to evolution partial differential equations. * Written by established mathematicians at the forefront of their field, this blend of delicate analysis and broad application is ideal for a course or seminar in asymptotic analysis and nonlinear PDEs. * Well-organized text with detailed index and bibliography, suitable as a course text or reference volume.

Digital Libraries - Current Issues Nabil R. Adam 1995-04-19 This volume is the first book coherently summarizing the current issues in digital libraries research, design and management. It presents, in a homogeneous way, thoroughly revised versions of 15 papers accepted for the First International Workshop on Digital Libraries, DL '94, held at Rutgers University in May 1994; in addition there are two introductory chapters provided by the volume editors, as well as a comprehensive bibliography listing 262 entries. Besides introductory aspects,

the topics addressed are administration and management, information retrieval and hypertext, classification and indexing, and prototypes and applications. The volume is intended for researchers and design professionals in the field, as well as for experts from libraries administration and scientific publishing.

Mathematical Analysis in Fluid Mechanics: Selected Recent Results Raphaël Danchin 2018-06-26 This volume contains the proceedings of the International Conference on Vorticity, Rotation and Symmetry (IV)—Complex Fluids and the Issue of Regularity, held from May 8–12, 2017, in Luminy, Marseille, France. The papers cover topics in mathematical fluid mechanics ranging from the classical regularity issue for solutions of the 3D Navier-Stokes system to compressible and non-Newtonian fluids, MHD flows and mixtures of fluids. Topics of different kinds of solutions, boundary conditions, and interfaces are also discussed.

Stochastic Evolution Equations Wilfried Grecksch 1995 The authors give a self-contained exposition of the theory of stochastic evolution equations. Elements of infinite dimensional analysis, martingale theory in Hilbert spaces, stochastic integrals, stochastic convolutions are applied. Existence and uniqueness theorems for stochastic evolution equations in Hilbert spaces in the sense of the semigroup theory, the theory of evolution operators, and monotonous operators in rigged Hilbert spaces are discussed. Relationships between the different concepts are demonstrated. The results are used to concrete stochastic partial differential equations like parabolic and hyperbolic Ito equations and random constitutive equations of elastic viscoplastic materials. Furthermore, stochastic evolution equations in rigged Hilbert spaces are approximated by time discretization methods.

Analysis in Banach Spaces Tuomas Hytönen 2018-02-14 This second volume of Analysis in Banach Spaces, Probabilistic Methods and Operator Theory, is the successor to Volume I, Martingales and Littlewood-Paley Theory. It presents a thorough study of the fundamental randomisation techniques and the operator-theoretic aspects of the theory. The first two chapters address the relevant classical background from the theory of Banach spaces, including notions like type, cotype, K-convexity and contraction principles. In turn, the next two chapters provide a detailed treatment of the theory of R-boundedness and Banach space valued square functions developed over the last 20 years. In the last chapter, this content is applied to develop the holomorphic functional calculus of sectorial and bi-sectorial operators in Banach spaces. Given its breadth of coverage, this book will be an invaluable reference to graduate students and researchers interested in functional analysis, harmonic analysis, spectral theory, stochastic analysis, and the operator-theoretic approach to deterministic and stochastic evolution equations.

Elliptic and Parabolic Problems Josef Bemelmans 2002-08-06 This book provides an overview of the state of the art in important subjects, including – besides elliptic and parabolic issues – geometry, free boundary problems, fluid mechanics, evolution problems in general, calculus of variations,

homogenization, control, modeling and numerical analysis. Contents:Rolduc:Models for Shape Memory Alloys Described by Subdifferentials of Indicator Functions (T Aiki & N Kenmochi)Local Stability Under Changes of Boundary Conditions at a Far Away Location (M Chipot & A Rougirel)Existence of Solutions of a Segregation Model Arising in Population Dynamics (G Galiano et al.)Global Attractors for Multivalued Flows Associated with Subdifferentials (N Kenmochi & N Yamazaki)Quasiconvexity and Optimal Design (P Pedregal)A Comparison Principle for the p-Laplacian (A Poliakovsky & I Shafrir)Gaeta:Nonlinear Diffusion in Irregular Domains (U G Abdulla)Viscosity Lyapunov Functions for Almost Sure Stability of Degenerate Diffusions (M Bardi & A Cesaroni)Approximating Exterior Flows by Flows on Truncated Exterior Domains: Piecewise Polygonal Artificial Boundaries (P Deuring)Epidemic Models with Compartmental Diffusion (W E Fitzgibbon et al.)Exact Controllability of Piezoelectric Shells (B Miara)Bifurcation in Population Dynamics (K Umezu)and other papers Readership: Graduate students and researchers in the fields of partial differential equations and applied mathematics. Keywords:

Collected Papers in Honor of Yoshihiro Shibata Tohru Ozawa 2023-01-01 Yoshihiro Shibata has made many significant contributions to the area of mathematical fluid mechanics over the course of his illustrious career, including landmark work on the Navier-Stokes equations. The papers collected here – on the occasion of his 70th birthday – are written by world-renowned researchers and celebrate his decades of outstanding achievements.

Nonlinear Dispersive Waves and Fluids Avy Soffer 2019-03-12 This volume contains the proceedings of the AMS Special Session on Spectral Calculus and Quasilinear Partial Differential Equations and the AMS Special Session on PDE Analysis on Fluid Flows, which were held in January 2017 in Atlanta, Georgia. These two sessions shared the underlying theme of the analysis aspect of evolutionary PDEs and mathematical physics. The articles address the latest trends and perspectives in the area of nonlinear dispersive equations and fluid flows. The topics mainly focus on using state-of-the-art methods and techniques to investigate problems of depth and richness arising in quantum mechanics, general relativity, and fluid dynamics.

Fluids Under Pressure Tomáš Bodnár 2020-04-30 This contributed volume is based on talks given at the August 2016 summer school “Fluids Under Pressure,” held in Prague as part of the “Prague-Sum” series. Written by experts in their respective fields, chapters explore the complex role that pressure plays in physics, mathematical modeling, and fluid flow analysis. Specific topics covered include: Oceanic and atmospheric dynamics Incompressible flows Viscous compressible flows Well-posedness of the Navier-Stokes equations Weak solutions to the Navier-Stokes equations Fluids Under Pressure will be a valuable resource for graduate students and researchers studying fluid flow dynamics.

Proceedings of the 4th European Conference, Elliptic and Parabolic Problems Josef Bemelmans 2002 This book provides an overview of the state of the art in important subjects, including ? besides elliptic and parabolic issues ?

geometry, free boundary problems, fluid mechanics, evolution problems in general, calculus of variations, homogenization, control, modeling and numerical analysis.

Fractional Differential Equations Anatoly Kochubei 2019-02-19 This multi-volume handbook is the most up-to-date and comprehensive reference work in the field of fractional calculus and its numerous applications. This second volume collects authoritative chapters covering the mathematical theory of fractional calculus, including ordinary and partial differential equations of fractional order, inverse problems, and evolution equations.

Index of Mathematical Papers 1985

Nonlinear Parabolic Equations and Hyperbolic-Parabolic Coupled Systems Songmu Zheng 2020-05-05 This monograph is devoted to the global existence, uniqueness and asymptotic behaviour of smooth solutions to both initial value problems and initial boundary value problems for nonlinear parabolic equations and hyperbolic parabolic coupled systems. Most of the material is based on recent research carried out by the author and his collaborators. The book can be divided into two parts. In the first part, the results on decay of solutions to nonlinear parabolic equations and hyperbolic parabolic coupled systems are obtained, and a chapter is devoted to the global existence of small smooth solutions to fully nonlinear parabolic equations and quasilinear hyperbolic parabolic coupled systems. Applications of the results to nonlinear thermoelasticity and fluid dynamics are also shown. Some nonlinear parabolic equations and coupled systems arising from the study of phase transitions are investigated in the second part of the book. The global existence, uniqueness and asymptotic behaviour of smooth solutions with arbitrary initial data are obtained. The final chapter is further devoted to related topics: multiplicity of equilibria and the existence of a global attractor, inertial manifold and inertial set. A knowledge of partial differential equations and Sobolev spaces is assumed. As an aid to the reader, the related concepts and results are collected and the relevant references given in the first chapter. The work will be of interest to researchers and graduate students in pure and applied mathematics, mathematical physics and applied sciences.

Motion by Mean Curvature and Related Topics Giuseppe Buttazzo 1994-01-01 The series is aimed specifically at publishing peer reviewed reviews and contributions presented at workshops and conferences. Each volume is associated with a particular conference, symposium or workshop. These events cover various topics within pure and applied mathematics and provide up-to-date coverage of new developments, methods and applications.

On the Evolution of Phase Boundaries Morton E. Gurtin 2012-12-06 This IMA Volume in Mathematics and its Applications ON THE EVOLUTION OF PHASE BOUNDARIES is based on the proceedings of a workshop which was an integral part of the 1990- 91 IMA program on "Phase Transitions and Free Boundaries". The purpose of the workshop was to bring together mathematicians and other scientists working

on the Stefan problem and related theories for modeling physical phenomena that occurs in two phase systems. We thank M.E. Gurtin and G. McFadden for editing the proceedings. We also take this opportunity to thank the National Science Foundation, whose financial support made the workshop possible. A vner Friedman Willard Miller, Jr. PREFACE A primary goal of the IMA workshop on the Evolution of Phase Boundaries from September 17-21, 1990 was to emphasize the interdisciplinary nature of contempo rary research in this field, research which combines ideas from nonlinear partial dif ferential equations, asymptotic analysis, numerical computation, and experimental science. The workshop brought together researchers from several disciplines, includ ing mathematics, physics, and both experimental and theoretical materials science.

Positivity and Noncommutative Analysis Gerard Buskes 2019-08-09 Capturing the state of the art of the interplay between positivity, noncommutative analysis, and related areas including partial differential equations, harmonic analysis, and operator theory, this volume was initiated on the occasion of the Delft conference in honour of Ben de Pagter's 65th birthday. It will be of interest to researchers in positivity, noncommutative analysis, and related fields. Contributions by Shavkat Ayupov, Amine Ben Amor, Karim Boulabiar, Qingying Bu, Gerard Buskes, Martijn Caspers, Jurie Conradie, Garth Dales, Marcel de Jeu, Peter Dodds, Theresa Dodds, Julio Flores, Jochen Glück, Jacobus Grobler, Wolter Groenevelt, Markus Haase, Klaas Pieter Hart, Francisco Hernández, Jamel Jaber, Rien Kaashoek, Turabay Kalandarov, Anke Kalauch, Arkady Kitover, Erik Koelink, Karimbergen Kudaybergenov, Louis Labuschagne, Yongjin Li, Nick Lindemulder, Emiel Lorist, Qi Lü, Miek Messerschmidt, Susumu Okada, Mehmet Orhon, Denis Potapov, Werner Ricker, Stephan Roberts, Pablo Román, Anton Schep, Claud Steyn, Fedor Sukochev, James Sweeney, Guido Sweers, Pedro Tradacete, Jan Harm van der Walt, Onno van Gaans, Jan van Neerven, Arnoud van Rooij, Freek van Schagen, Dominic Vella, Mark Veraar, Anthony Wickstead, Marten Wortel, Ivan Yaroslavtsev, and Dmitriy Zanin.

Parabolic Problems Joachim Escher 2011-07-20 The volume originates from the 'Conference on Nonlinear Parabolic Problems' held in celebration of Herbert Amann's 70th birthday at the Banach Center in Bedlewo, Poland. It features a collection of peer-reviewed research papers by recognized experts highlighting recent advances in fields of Herbert Amann's interest such as nonlinear evolution equations, fluid dynamics, quasi-linear parabolic equations and systems, functional analysis, and more.