

Equations aux dérivées partielles

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hyperbolic 3-space; it can also be regarded as a subgroup of the group of Möbius transformations in the complex plane. The study of Kleinian groups has become an active area in mathematics and deals with many interesting theories. This book provides fundamental results and important theorems which are needed for access to the frontiers of the theory from a modern point of view.

Equations différentielles ordinaires

V.K. DZYADYK. — **Approximation methods for solutions of differential and integral equations.** — Un vol. relié, $16,5 \times 24,5$, de 325 p. — ISBN 90-6764-194-4. — Prix: DM 259.00. — VSP, Utrecht, 1995.

This book is the result of 20 years of investigations, in order to bring closer and synthesize a number of well-known results, ideas and methods from the theory of function approximation, theory of differential and integral equations and numerical analysis. The book opens with an introduction on the theory of function approximation and is followed by a new approach to the Fredholm integral equations of the second kind. Several chapters are devoted to the construction of new methods for the effective approximation of solutions of several important integral, and ordinary and partial differential equations. In addition, new general results on the theory of linear differential equations with one regular singular point, as well as applications of the various new methods are discussed.

V. LAKSHMIKANTHAM, A.S. VATSALA. — **Generalized quasilinearization for nonlinear problems.** — Mathematics and its applications, vol. 440 — Un vol. relié, $16,5 \times 24,5$, de ix, 276 p. — ISBN 0-7923-5038-3. — Prix: Dfl. 260.00. — Kluwer Academic Publishers, Dordrecht, 1998.

The book provides a systematic development of the generalized quasilinearization indicating the notions and technical difficulties that are encountered in the unified approach. It enhances considerably the usefulness of the method of quasilinearization which has proved to be very effective in several areas of investigation and in applications. Further it includes the well known monotone iterative technique as a special case.

Equations aux dérivées partielles

A. ASANOV and E.R. ATAMANOV. — **Nonclassical and inverse problems for pseudoparabolic equations.** — Inverse and ill-posed problems series. — Un vol. relié, $16,5 \times 24$, de 152 p. — ISBN 90-6764-235-5. — Prix: DM 150.00. — VSP, Utrecht, 1997.

The problems considered in this book are related to the theory of differential equations with partial derivatives from the ill-posed problem theory and are generally ill-posed in the Hadamard sense. The basic topic discussed is the conditional well-posedness of such problems. This represents the proof of uniqueness and stability theorems in the appropriate classes of functions. In some cases, existence theorems are also considered. The book opens with a chapter on the Cauchy problem with data in a time-like manifold for pseudoparabolic equations. Chapter 2 deals with interior problems for pseudoparabolic equations and the last chapter deals with inverse problems for operator pseudoparabolic equations.

E. BAINOV, V. COVACHEV, (Editors). — **Proceedings of the fifth International Colloquium on Differential Equations: Plovdiv, Bulgaria, 18-23 August, 1994.** — Un vol. relié, $16,5 \times 24,5$, de vii, 362 p. — ISBN 90-6764-192-8. — Prix: DM 210.00. — VSP, Utrecht, 1995.

The colloquium was organized by UNESCO and the Plovdiv Technical University, with the help of many international mathematical organizations. This proceedings volume contains

selected invited talks which deal with the following topics: impulsive differential equations, differential equations with maxima, nonlinear differential equations, applications of differential equations.

D. BAINOV, (Editor). — **Proceedings of the seventh International Colloquium on Differential Equations: Plovdiv, Bulgaria, 18-23 August, 1996.** — Un vol. relié, $16,5 \times 24,5$, de IX, 468 p. — ISBN 90-6764-233-9. — Prix: DM 264.00. — VSP, Utrecht, 1997.

This proceedings volume contains selected talks which deal with various aspects of differential and partial differential equations. This book will be of value and interest to researchers and postgraduate students in the field of pure and applied mathematics, physics, biology, and engineering.

D. BAINOV, (Editor). — **Proceedings of the eighth International Colloquium on Differential Equations: Plovdiv, Bulgaria, 18-23 August 1997.** — Un vol. relié, $16,5 \times 24,5$, de IX, 439 p. — ISBN 90-6764-279-7. — Prix: DM 267.00. — VSP, Utrecht, 1998.

This proceedings volume contains selected talks which deal with various aspects of differential and partial differential equations. The book will be of value and interest to researchers and postgraduate students in the field of pure and applied mathematics, physics, biology and engineering.

Jean-Pierre BOURGUIGNON, Paolo de BARTOLOMEIS, Mariano GIAQUINTA, (Editors). — **Geometric theory of singular phenomena in partial differential equations.** — Symposia mathematica, vol. 38. — Un vol. relié, 16×24 , de 182 p. — ISBN 0-521-63246-3. — Prix: £40.00. — Cambridge University Press, Cambridge, 1998.

Featuring contributions from a group of outstanding mathematicians, this book covers the most recent advances in the geometric theory of singular phenomena of partial differential equations occurring in real and complex differential geometry. Gathering together papers from a workshop held in Cortona, Italy, this volume will be of interest to all those whose research interests lie in real and complex differential geometry, partial differential equations, and gauge theory.

Jeffery M. COOPER. — **Introduction to partial differential equations with MATLAB.** — Applied and numerical harmonic analysis. — Un vol. relié, $16,5 \times 24$, de xv, 540 p. — ISBN 0-8176-3967-5. — Prix: SFr. 118.00. — Birkhäuser, Boston, 1998.

This advanced text/reference is an introduction to partial differential equations covering the traditional topics within a modern context. To provide an up-to-date treatment, techniques of numerical computation have been included with carefully selected nonlinear topics, including nonlinear first order equations. Each equation studied is placed in the appropriate physical context. The analytical and numerical aspects of solutions are discussed in an integrated fashion with extensive examples and exercises, both analytical and computational.

Christoph DORSCHFELDT. — **Algebras of pseudodifferential operators near edge and corner singularities.** — Mathematical research, vol. 102. — Un vol. broché, 17×24 , de 202 p. — ISBN 3-527-40118-0. — Prix: DM 128.00. — Wiley-VCH, Berlin, 1998.

This book deals with analysis on manifolds with singularities. More precisely, it presents pseudodifferential operators near edges and corners. In particular, it considers parameter-dependent edge operators and edge operators of Mellin type. The investigation of such operator families is necessary to construct operator algebras on manifolds with higher singularities. A self-contained exposition in Mellin techniques and pseudodifferential operators with operator-valued symbols is given. The algebra of parameter-dependent edge operators is constructed.

Finally, Mellin operators near corner singularities are investigated. The focus is on elliptic theory. Elliptic operators on manifolds with edges are constructed as well as parametrices to elliptic elements.

Samuil D. EIDELMAN, Nicolae V. ZHITARASHU. — **Parabolic boundary value problems.** — Translated from the Russian by Gennady Pasechnik and Andrei Iacob. — Operator theory: advances and applications, vol. 101. — Un vol. relié, 17×24 , de x, 295 p. — ISBN 3-7643-2972-6. — Prix: SFr. 198.00. — Birkhäuser Verlag, Basel, 1998.

The present monograph is devoted to the theory of general parabolic boundary problems. It starts with basic notions and various illustrative examples, followed by a detailed and systematic exposition of the L^2 -theory of parabolic boundary value problems with smooth coefficients in Hilbert spaces of smooth functions and distributions of arbitrary finite order. A survey of the Cauchy problem and boundary value problem in spaces of smooth functions broadens the scope of the work. Special attention is paid to a detailed study of examples illustrating and complementing the theory.

Equations aux dérivées partielles et applications: articles dédiés à Jacques-Louis Lions. — Un vol. relié, 18×25 , de vii, 808 p. — ISBN 2-84299-041-2. — Prix: FF 781.00 (Union européenne). — Gauthier-Villars/Editions scientifiques et médicales Elsevier, Paris, 1998.

Ce livre est une collection d'articles de recherche originaux, de niveau international, en mathématiques appliquées, et plus particulièrement en équations aux dérivées partielles. De nombreux domaines différents de ce vaste champ de recherche sont couverts: existence, régularité et stabilité d'équations aux dérivées partielles non linéaires; explosion en temps fini et formation de singularités; contrôle optimal et optimisation; contrôle de forme; sentinelles; problèmes de contrôlabilité; interpolation; théorie de la complexité; problèmes de mécanique des solides: élasticité, problèmes de vibration et d'acoustique; homogénéisation; problèmes de mécanique des fluides: équations d'Euler, équations de Navier-Stokes; problèmes de météorologie, de climatologie et d'océanographie; assimilation de données; analyse numérique: éléments finis, majorations d'erreur... Les articles ont été écrits par des élèves et de proches collaborateurs de Jacques-Louis Lions, Professeur au Collège de France, et lui sont dédiés à l'occasion de son soixante-dixième anniversaire. Les articles sont écrits en français et en anglais.

Alexander PANKOV. — **G-convergence and homogenization of nonlinear partial differential operators.** — Mathematics and its applications, vol. 422. — Un vol. relié, $16,5 \times 24,5$, de xiii, 249 p. — ISBN 0-7932-4720-X. — Prix: Dfl. 210.00. — Kluwer Academic Publishers, Dordrecht, 1997.

Chapter 1 is devoted to some preliminary issues from nonlinear analysis as well as to G -convergence of abstract operators, including the case of abstract parabolic operators. Chapter 2 introduces details of the notion of strong G -convergence for nonlinear second order elliptic operators in divergence form, and in Chapter 3 the homogenization problem for rapidly oscillated nonlinear random homogenous elliptic operators is dealt with. In Chapter 4, some of the previous results are extended to the case of nonlinear parabolic operators.

Endre PAP, Arpad TAKAČI, and Djiurdjica TAKAČI. — **Partial differential equations through examples and exercises.** — Kluwer texts in the mathematical sciences, vol. 18. — Un vol. relié, $16,5 \times 25$, de xii, 404 p. — ISBN 0-7923-4724-2. — Prix: Dfl. 320.00. — Kluwer Academic Publishers, Dordrecht, 1997.

This book examines the complicated subject of Partial Differential Equations (PDEs). It involves the reader throughout by presenting theory, examples and exercises together. Both the classical and abstract aspects of the theory are dealt with, so that, for example, classical and generalized solutions in Sobolev and distribution spaces are treated. Most of the work is devoted

to second or higher order PDEs, part of the distribution theory is included, covering Dirac's delta distribution "delta function". Many practical tools are offered for solving important problems with the basic three PDEs, namely the wave equation, the Laplace equation, the heat equation and their generalizations.

Isaak RUBINSTEIN, Lev RUBINSTEIN. — **Partial differential equations in classical mathematical physics.** — Un vol. broché, $18 \times 25,5$, de XIV, 677 p. — ISBN 0-521-55846-8. — Prix : £24.95 (relié: £70.00). — Cambridge University Press, Cambridge, 1998.

The unique feature of this book is that it considers the theory of partial differential equations in mathematical physics as the language of continuous processes, that is to say, as an interdisciplinary science that treats the hierarchy of mathematical phenomena as reflections of their physical counterparts. Special attention is drawn to tracing the development of these mathematical phenomena in different natural sciences, with examples drawn from continuum mechanics, electrodynamics, transport phenomena, thermodynamics, and chemical kinetics. At the same time, the authors trace the interrelation between the different types of problems – elliptic, parabolic, and hyperbolic – as the mathematical counterparts of stationary and evolutionary processes.

T.I. ZELENYAK, M.M. LAVRENTIEV Jr. and M.P. VISHNEVSKII. — **Qualitative theory of parabolic equations: Part 1.** — Un vol relié, $16,5 \times 25$, de 417 p. — ISBN 90-6764-236-3. — Prix : DM 266.00. — VSP, Utrecht, 1997.

In this publication only parabolic problems are considered. Here lie, mainly, the problems which have been investigated most thoroughly – the construction of Liapunov functionals which naturally generalize Liapunov functions for nonlinear parabolic equations of the second order with one spatial variable. The authors establish stabilizing solution theorems, and the necessary and sufficient conditions of general and asymptotic stability of stationary solutions, including the so-called critical case. Attraction domains for stable solutions of mixed problems for these equations are described. Furthermore, estimates for the number of stationary solutions are obtained.

Analyse de Fourier, analyse harmonique abstraite

Barbara Burke HUBBARD. — **The world according to wavelets: the story of a mathematical technique in the making.** — Second edition. — Un vol. relié, 16×24 , de XX, 330 p. — ISBN 1-56881-072-5. — Prix : US\$40.00. — A.K. Peters, Wellesley, Mass., 1998.

Over the past few years, a new mathematical language has been developing, its alphabet consisting of undulations called "wavelets". Today "the wavelet revolution" is enabling many mathematicians to perform a surprising variety of practical projects, from fingerprint encoding to recovering music from battered 19th century recordings. Lovingly crafted by an award-winning popular science writer, this second edition of a highly accessible, prizewinning book (winner of the French Mathematical Society's 1996 d'Alembert prize) retains its original appeal for non-mathematicians while incorporating expanded discussions of wavelet history, applications, and technical advances.

K.A. ROSS, J.M. ANDERSON, G.L. LITVINOV, A.I. SINGH, V.S. SUNDER, N.J. WILDBERGER, (Editors). — **Harmonic analysis and hypergroups.** — Trends in mathematics. — Un vol. relié, $16 \times 24,5$, de 249 p. — ISBN 0-8176-3943-8. — Prix : SFr. 178.00. — Birkhäuser, Boston, 1998.

Among the distinguished analysts from around the world who took part in the International New Delhi Conference on Harmonic Analysis were 21 participants whose papers comprise the proceedings of this volume. An underlying theme is the notion of hypergroups, the theory of