

Équations aux dérivées partielles

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Positivity conditions for real-analytic functions. — Peter Ebenfelt, Xiajun Huang: On a generalized reflection principle in \mathbb{C}^2 . — Siqi Fu, Emil J. Straube: Compactness in the delta bar-Neumann problem. — Joseph J. Kohn: Hypocoellipticity at non-subelliptic points. — Yum-Tong Siu: Very ampleness part of Fujita's conjecture and multiplier ideal sheaves of Kohn and Nadel.

Claude SABBAH. — **Déformations isomonodromiques et variétés de Frobenius.** — Collection Mathématiques. — Collection Savoirs Actuels. — Un vol. broché, $15,5 \times 23$, de xvi, 289 p. — ISBN 2-86883-534-1 (EDP Sciences), 2-271-05569-0 (CNRS Editions). — Prix: €42.00. — EDP Sciences/CNRS Editions, Paris.

La théorie des déformations isomonodromiques est une machine à produire des systèmes non linéaires d'équations différentielles ou aux dérivées partielles dans le domaine complexe et ce, à partir d'une équation ou d'un système d'équations linéaires d'une variable complexe. La notion de structure de Frobenius sur une variété, apparue d'abord dans la théorie des singularités, puis développée sous l'impulsion de motivations physiques, en est une belle application. Ce texte est issu de plusieurs cours dispensés dans le cadre de la formation doctorale des universités de Paris VI, Bordeaux I et Strasbourg ainsi que lors d'une école sur les variétés de Frobenius au CIRM (Luminy).

Équations aux dérivées partielles

Michel CHIPOT. — *l goes to plus infinity.* — Birkhäuser advanced texts. — Un vol. relié, 17×24 , de viii, 180 p. — ISBN 3-7643-6646-X. — Prix: SFr. 78.00. — Birkhäuser, Basel, 2002.

Many physical problems are meaningfully formulated in a cylindrical domain. When the size of the cylinder goes to infinity, the solutions, under certain symmetry conditions, are expected to be identical in every cross-section of the domain. The proof of this, however, is sometimes difficult and almost never given in the literature. The present book partially fills this gap by providing proofs of the asymptotic behavior of solutions to various important cases of linear and nonlinear problems in the theory of elliptic and parabolic partial differential equations.

Giuseppe DA PRATO, Jerzy ZABCZYK. — **Second order partial differential equations in Hilbert spaces.** — London Mathematical Society lecture note series, vol. 293. — Un vol. broché, 15×23 , de xvi, 379 p. — ISBN 0-521-77729-1. — Prix: £29.95. — Cambridge University Press, Cambridge, 2002.

Partial differential equations for functions defined on infinite dimensional Hilbert spaces are natural generalizations of well known parabolic and elliptic equations for which the theory is now classical. The main aim of the authors is to present a state of the art treatment of this theory in a unified way. The tools used are the theory of measures on Banach spaces, semigroup and interpolation theories as well as the theory of stochastic evolution equations. The book is divided into three parts devoted respectively to the theory in the spaces of continuous functions, to the theory in Sobolev spaces with respect to Gaussian measures and to applications to control theory. Numerous comments and references in the book point the reader to more specialized results not covered here.

Jürgen JOST. — **Partial differential equations.** — Graduate texts in mathematics, vol. 214. — Un vol. relié, $16 \times 24,5$, de xi, 325 p. — ISBN 0-387-95428-7. — Prix: €59.95. — Springer, New York, 2002.

The author focuses on elliptic equations and systematically develops the relevant existence schemes, always with a view toward nonlinear problems. These are maximum principle methods

(particularly important for numerical analysis schemes), parabolic equations, variational methods, and continuity methods. This book develops the main methods for obtaining estimates for solutions of elliptic equations: Sobolev space theory, weak and strong solutions, Schauder estimates, and Moser iteration. Connections between elliptic, parabolic, and hyperbolic equations are explored, as well as the connection with Brownian motion and semigroups. This book can be utilized for a one-year course on partial differential equations.

C. ROGERS, W.K. SCHIEF. — **Bäcklund and Darboux transformations: geometry and modern applications in soliton theory.** — Cambridge texts in applied mathematics. — Un vol. broché, 15×22,5, de xvii, 413 p. — ISBN 0-521-01288-0. — Prix: £24.95. — Cambridge University Press, Cambridge, 2002.

The authors explore the extensive body of literature from the nineteenth and early twentieth centuries by eminent geometers on transformations of privileged classes of surfaces which leave key geometric properties unchanged. Prominent amongst these are Bäcklund-Darboux transformations with their remarkable associated nonlinear superposition principles and importance in soliton theory. It is with these transformations and the links they afford between the classical differential geometry of surfaces and the nonlinear equations of soliton theory that the present text is concerned. In this geometric context, solitonic equations arise out of the Gauss-Mainardi-Codazzi equations for various types of surfaces that admit invariance under Bäcklund-Darboux transformations.

Hermann SOHR. — **The Navier-Stokes equations: an elementary functional analytic approach.** — Birkhäuser advanced texts. — Un vol. relié, 17×24, de x, 367 p. — ISBN 3-7643-6545-5. — Prix: SFr. 74.00. — Birkhäuser, Basel, 2001.

The primary objective of this monograph is to develop an elementary and self-contained approach to the mathematical theory of a viscous, incompressible fluid in a domain of the Euclidean space, described by the equations of Navier-Stokes. Moreover, the theory is presented for completely general domains, in particular, for arbitrary unbounded, nonsmooth domains. Therefore, restriction was necessary to space dimensions two and three, which are also the most significant from a physical point of view. For mathematical generality, however, the linearized theory is expounded for general dimensions higher than one. Although the functional analytic approach developed here is, in principle, known to specialists, the present book fills a gap in the literature by providing a systematic treatment of a subject that has been documented until now only in fragments.

Systemes dynamiques et théorie ergodique

J.M. BLACKLEDGE, A.K. EVANS, M.J. TURNER, (Editors). — **Fractal geometry: mathematical methods, algorithms, applications.** — Horwood Publishing series in mathematics and applications. — Un vol. relié, 16×24, de xii, 232 p. — ISBN 1-904275-00-1. — Prix: £40.00. — Horwood Publishing, Chichester, published on behalf of The Institute of Mathematics and its Applications, 2002.

International authorities from Canada, Denmark, England, Germany, Russia and South Africa focus on up-to-date research on fractal geometry and the best practices in software, theoretical mathematical algorithms, and analysis. — *Contents*: Chaotic dynamics in a simple aeromechanical system. — Random walks with fluctuating step number, scale invariant behaviour, and self-organised criticality. — Fractional integrals, singular measures and epsilon