

# Analyse de Fourier, analyse harmonique abstraite

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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,  $16 \times 24$ , 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 19<sup>th</sup> 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

which has been developed and used in fields as diverse as special functions, differential equations, probability theory, representation theory, measure theory, Hopf algebras, and quantum groups. Other timely topics include the harmonic analysis of analytic functions, ergodic theory and wavelets.

Sundaram THANGAVELU. — **Harmonic analysis on the Heisenberg group.** — Progress in mathematics, vol. 159. — Un vol. relié, 16×24, de XII, 191 p. — ISBN 0-8176-4050-9. — Prix: SFr. 88.00. — Birkhäuser, Boston, 1998.

This monograph deals with various aspects of harmonic analysis on the Heisenberg group, which is the most commutative among the non-commutative Lie groups, and hence gives the greatest opportunity for generalizing the remarkable results of Euclidean harmonic analysis. The aim of this text is to demonstrate how the standard results of Abelian harmonic analysis take shape in the non-Abelian setup of the Heisenberg group. Several results in this monograph appear for the first time in book form, and some theorems have not appeared elsewhere. Topics covered include the Plancherel and Paley-Wiener theorems, spectral theory of the sublaplacian, Wiener-Tauberian theorems, Bochner-Riesz means and multipliers for the Fourier transform.

### *Equations intégrales*

Andrei D. POLYANIN and Alexander V. MANZHIROV. — **Handbook of integral equations.** — Un vol. relié, 19×26, de XXVII, 787 p. — ISBN 0-8493-2876-4. — Prix: DM 228.00. — CRC Press, Boca Raton, Florida, distributed by Springer-Verlag, Berlin, 1998.

This book contains more than 2100 integral equations and their solutions and describes new exact solutions to linear and nonlinear equations. Integral equations are considered in relation to various fields of mechanics and theoretical physics, including elasticity, plasticity, hydrodynamics, heat and mass transfer, and electrodynamics. It outlines exact, approximate analytical, and numerical methods for solving linear and nonlinear integral equations and describes symbolic methods, singular integral equations, and translational integral equations. The book includes supplements, featuring properties of elementary and special functions, tables of indefinite and definite integrals, and tables of Laplace, Mellin, and other transforms.

### *Analyse fonctionnelle et théorie des opérateurs*

Sheldon AXLER, John E. MCCARTHY, Donald SARASON. — **Holomorphic spaces.** — Mathematical Sciences Research Institute publications, 33. — Un vol. relié, 16,5×24, de IX, 476 p. — ISBN 0-521-63193-9. — Prix: £35.00. — Cambridge University Press, Cambridge, 1998

This a collection of expository articles arising from MSRI's Fall 1995 program on holomorphic spaces. The opening article gives an overview of several aspects of the subject. The remaining articles, while more specialized, are nevertheless designed to be accessible to the non expert. A range of topics is addressed: Bergman spaces, Hankel operators in various guises, the Dirichlet space, subnormal operators, operators models, interpolation problems, systems theory. The concluding article describes an approach to certain commuting families of nonselfadjoint operators in which operator theory is linked with algebraic geometry.

David E. EVANS, Yasuyuki KAWAHIGASHI. — **Quantum symmetries on operator algebras.** — Oxford mathematical monographs. — Un vol. relié, 16×24, de XXV, 829 p. — ISBN 0-19-851175-2. — Prix: £ 105.00. — Oxford, Oxford University Press, 1998.

This is one of the first books to look at the remarkable connections recently made with knot theory, 3-manifolds, quantum groups and integrable systems in statistical mechanics and