

# Analyse de Fourier, analyse harmonique abstraite

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features, lifetimes, and peculiar ways of interacting. This book provides an introduction to this complex area of study. It covers a variety of topics, including soliton theory, nonlinear lattices, excitable media, perturbation theory, and the theory of quantum lattices, with a strong emphasis on the applications to experimental reality. It is designed to serve as both a textbook and as a general reference for students and researchers of nonlinear dynamics.

Dennis SERRE. — **Systems of conservation laws, 1: Hyperbolicity, entropies, shock waves.** — Translated by I.N. Sneddon. — Un vol. relié, 18×25,5, de xxii, 263 p. — ISBN 0-521-58233-4. — Prix: £40.00. — Cambridge University Press, Cambridge, 1999.

This book sets up the foundations of the modern theory of conservation laws describing the physical models and mathematical methods, leading to the Glimm scheme. Building on this the author then takes the reader to the current state of knowledge in the subject. In particular, he studies in detail viscous approximations, paying special attention to viscous profiles of shock waves. The maximum principle is considered from the viewpoint of numerical schemes and also in terms of viscous approximation. Small waves are studied using geometrical optics methods. Finally, the initial-boundary problem is considered in depth.

### *Systemes dynamiques et théorie ergodique*

Clark ROBINSON. — **Dynamical systems: stability, symbolic dynamics, and chaos.** — Second edition. — Studies in advanced mathematics. — Un vol. relié, 19×26, de 506 p. — ISBN 0-8493-8495-8. — Prix: DM 165.00. — CRC Press, Boca Raton, 1999, distributed by Springer, Berlin.

The book treats the dynamics of both iteration of functions and solutions of ordinary differential equations. This second edition provides a revised discussion of the saddle node bifurcation, a new section on the horseshoe for a flow with a transverse homoclinic point, material on horseshoes for nontransverse homoclinic points, indicating recent extensions to the understanding of how horseshoes arise, information proving the ergodicity of a hyperbolic toral automorphism, a new chapter on Hamiltonian systems.

### *Approximations et développements en série*

Gheorghe MICULA and Sanda MICULA. — **Handbook of splines.** — Mathematics and its applications, vol. 462. — Un vol. relié, 16,5×24,5, de xvi, 604 p. — ISBN 0-7923-5503-2. — Prix: Dfl. 495.00. — Kluwer Academic Publishers, Dordrecht, 1999.

The purpose of this book is to give a comprehensive approach to the theory of spline functions, from the introduction of the phrase “spline” by I.J. Schoenberg in 1946 to the newest theories of spline-wavelets or spline-fractals, emphasizing the significance of the relationship between the general theory and its applications. In addition, it provides new material on spline function theory, as well as a fresh look at basic methods in spline functions. An extensive reference section is provided.

### *Analyse de Fourier, analyse harmonique abstraite*

Michael W. FRAZIER. — **An introduction to wavelets through linear algebra.** — Undergraduate texts in mathematics. — Un vol. relié, 16,5×24,5, de xvi, 501 p. — ISBN 0-387-98639-1. — Prix: DM 98.00. — Springer, New York, 1999.

This introduction to wavelets assumes a basic background in linear algebra (reviewed in Chapter 1) and real analysis at the undergraduate level. Fourier and wavelet analyses are first

presented in the finite-dimensional context, using only linear algebra. Then Fourier series are introduced in order to develop wavelets in the infinite-dimensional, but discrete context. Finally, the text discusses Fourier transform and wavelet theory on the real line. The computation of the wavelet transform via filter banks is emphasized, and applications to signal compression and numerical differential equations are given.

## *Transformations intégrales, calcul opérationnel*

Sigurður HELGASON. — **The Radon transform.** — Second revised and extended edition. — Progress in mathematics, vol. 5. — Un vol. relié,  $16 \times 24$ , de XII, 188 p. — ISBN 3-7643-4109-2. — Prix: SFr. 74.00. — Birkhäuser, Boston, 1999.

This second edition, significantly expanded and updated, presents new material taking into account some of the progress made in the field since 1980. The first chapter introduces the Radon transform and presents new material on the  $d$ -plane transform and applications to the wave equation. Chapter 2 places the Radon transform in a general framework of integral geometry known as a double fibration of a homogeneous space. Several significant examples are developed in detail. Two subsequent chapters treat some specific examples of generalized Radon transforms, for example, antipodal manifolds in compact 2-point homogeneous spaces, and orbital integrals in isotropic Lorentzian manifolds. A final chapter deals with Fourier transforms and distributions, developing all the tools needed in the work.

## *Analyse fonctionnelle et théorie des opérateurs*

Richard BECKER. — **Cônes convexes en analyse.** — Postface de Gustave Choquet. — Travaux en cours, vol. 59. — Un vol. broché,  $17,5 \times 24,5$ , de 245 p. — ISBN 2-7056-6384-3. — Prix: FF 180.00. — Hermann, Paris, 1999.

Cette monographie expose la théorie de la représentation intégrale dans les cônes convexes, due à G. Choquet, et plusieurs de ses applications à l'analyse: théorèmes classiques de Bochner-Weil et de Bernstein, théorème de Choquet-Deny, axiomatiques de Brelot et Bauer en théorie du potentiel, résultats de Talagrand sur les mesures et capacités invariantes, et de Royer et Yor sur les mesures quasi-invariantes en théorie des champs. Cette théorie est étudiée également pour son intérêt propre, et ses liens avec des disciplines voisines de l'analyse: étude des zoniformes et des mesures vectorielles, théorie de la décision statistique, cônes biréiculés et structure des cônes normaux dans un Banach. Une maîtrise d'université orientée vers l'analyse suffit pour aborder cette monographie.

William O. BRAY, Časlav V. STANOJEVIĆ, (Editors). — **Analysis of divergence: control and management of divergent processes.** — Applied and numerical harmonic analysis. — Un vol. relié,  $16,5 \times 24,5$ , de XX, 567 p. — ISBN 0-8176-4058-4. — Prix: SFr. 138.00. — Birkhäuser, Boston, 1999.

Divergent processes are at the core of classical and modern mathematical analysis and the careful control and management of these processes are essential. This new book is a comprehensive survey of new results, analysis, and applications for the study of divergent processes. It covers a broad range of topics including summability, Fourier series, wavelet transform, singular integrals, spectral theory and asymptotics. It is an essential resource for pure and applied mathematicians working in the areas of functional analysis, singular integrals, variational problems, signal analysis and wavelet analysis.