

# Systemes dynamiques et theorie ergodique

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future. However, theories also lead to solutions of some problems and several such solutions are given including a comprehensive account of the geometric convolution theory.

Claude WAGSCHAL. — **Fonctions holomorphes. Équations différentielles: exercices corrigés.** — Collection méthodes. — Un vol. broché, 15×22, de xvii, 457 p. — ISBN 2-7056-6456-4. — Prix: €40.00. — Hermann, Paris, 2003.

Le premier chapitre de cet ouvrage est consacré à la théorie des fonctions holomorphes, essentiellement d'une variable complexe. On y trouvera un exposé des notions de topologie algébrique (homotopie, revêtement, etc.) indispensables pour comprendre certains aspects de cette théorie, en particulier tout ce qui se rattache au prolongement analytique. Il comporte également de très nombreux exercices de difficulté variable dont les solutions sont données en fin de chapitre. Le second chapitre est une introduction à la théorie des équations différentielles, aussi bien dans le champ réel que dans le domaine complexe. On aborde en particulier l'étude des équations différentielles à points singuliers réguliers: théorème de Fuchs, théorèmes d'indice (Komatsu-Malgrange). On y traite également des équations aux dérivées partielles du premier ordre dont la résolution se réduit à celle de leur système caractéristique (méthodes de Cauchy) et, enfin, on résout le problème de Cauchy pour des équations aux dérivées partielles holomorphes d'ordre supérieur (théorème de Cauchy-Kowalevsky).

### *Equations différentielles ordinaires*

Valerii I. GROMAK, Ilpo LAINE, Shun SHIMOMURA. — **Painlevé differential equations in the complex plane.** — De Gruyter studies in mathematics, vol. 28. — Un vol. relié, 18×24,5, de viii, 303 p. — ISBN 3-11-017379-4. — Prix: €82.24. — Walter de Gruyter, Berlin, 2002.

This book is the first comprehensive treatment of the matter. Starting with a rigorous presentation for the meromorphic nature of their solutions, the Nevanlinna theory will be applied to offer a detailed exposition of growth aspects and value distribution of Painlevé transcendents. The subsequent main part of the book is devoted to topics of classical background such as representations and expansions of solutions, solutions of special type like rational and special transcendental solutions, Bäcklund transformations and higher order analogues, treated separately for each of these six equations. The final chapter offers a short overview of applications of Painlevé equations, including an introduction to their discrete counterparts.

### *Systèmes dynamiques et théorie ergodique*

John BANKS, Valentina DRAGAN, Arthur JONES. — **Chaos: a mathematical introduction.** — Australian Mathematical Society lecture series, vol. 18. — Un vol. broché, 15×23, de xi, 294 p. — ISBN 0-521-53104-7. — Prix: £27.95. — Cambridge University Press, Cambridge, 2003.

When new ideas such as chaos first move into the mathematical limelight, the early textbooks tend to be very difficult. The concepts are new and it takes time to find ways to present them in a form digestible to the average student. This process may take a generation, but eventually, what originally seemed far too advanced for all but the most mathematically sophisticated becomes accessible to a much wider readership. This book takes major steps along that path of generational change. It presents ideas about chaos in discrete time dynamics in a form that should be accessible to anyone who has taken a first course in undergraduate calculus. More remarkably, it manages to do so without discarding a commitment to mathematical substance and rigour.

Peter GRABNER, Wolfgang WOESS, (Editors). — **Fractals in Graz 2001: analysis – dynamics – geometry – stochastic.** — Trends in mathematics. — Un vol. relié,  $17 \times 24$ , de XI, 162 p. — ISBN 3-7643-7006-8. — Prix: SFr. 98.00. — Birkhäuser, Basel, 2003.

The volume presents a multitude of different directions of active current research linked with the modern theory of fractal structures. All papers were written upon invitation by the editors. The book is addressed to mathematicians and scientists who are interested in any of the following topics: fractal dimensions, fractal energies, fractal groups, stochastic processes on fractals, self-similarity, spectra of random walks, tilings, analysis on fractals, dynamical systems. The readers will be introduced to the most recent results and problems on these subjects. Both researchers and graduate students will benefit from the clear expositions.

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

Antoni ZYGMUND. — **Trigonometric series.** — With a foreword by Robert Fefferman. — Third edition, volumes I and II combined. — Cambridge mathematical library. — Un vol. broché,  $15 \times 23$ , de XIII, 383 p. et VII, 364 p. — ISBN 0-521-89053-5. — Prix: £ 39.95. — Cambridge University Press, Cambridge, 2003.

A greatly enlarged second edition published by Cambridge in two volumes in 1959 took full account of developments in trigonometric series, Fourier series and related branches of pure mathematics since publication of the original edition. The two volumes are here bound together. Volume I, containing the completely rewritten material of the original work, deals with trigonometric series and Fourier series – auxiliary results: Fourier coefficients – elementary theorems on the convergence of  $S_n$ ; summability of Fourier series; classes of functions and Fourier series; special trigonometric series; the absolute convergence of trigonometric series; complex methods in Fourier series; divergence of Fourier series; Riemann's theory of trigonometric series. Volume II provides much material previously unpublished in book form, and covers trigonometric interpolation; differentiation of series – generalized derivatives; interpolation of linear operation – more about Fourier coefficients; convergence and summability almost everywhere; complex methods; applications of the Littlewood-Paley function to Fourier series; Fourier integrals; a topic in multiple Fourier series.

### *Analyse fonctionnelle*

Pere ARA, MARTIN MATHIEU. — **Local multipliers of  $C^*$ -algebras.** — Springer monographs in mathematics. — Un vol. relié,  $16 \times 24$ , de XII, 319 p. — ISBN 1-85233-237-9. — Prix: € 86.95. — Springer, London, 2003.

The theme of this book is operator theory on  $C^*$ -algebras. The main novel tool employed is the concept of local multipliers. The book serves two purposes. The first part provides the reader with a thorough introduction to the theory of local multipliers. Only a minimal knowledge of algebra and analysis is required, as the prerequisites in both non-commutative ring theory and basic  $C^*$ -algebra theory are presented in the first chapter. In the second part, local multipliers are used to obtain a wealth of information on various classes of operators on  $C^*$ -algebras, including (groups of) automorphisms, derivations, elementary operators, Lie isomorphisms and Lie derivations, as well as others. Many of the results appear in print for the first time. The authors have made an effort to avoid intricate technicalities thus some of the results are not pushed to their utmost generality. Several open problems are discussed, and hints for further developments are given.