

# Équations aux différences finies, équations fonctionnelles

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that the main features of analytic microlocal analysis are derived from a single and elementary a priori estimate. Various exercises illustrate the chief results of each chapter while introducing the reader to further developments of the theory. Applications to the study of the Schrödinger operator are also discussed, to further the understanding of new notions or general results by placing them in the context of quantum mechanics.

Graeme W. MILTON. — **The theory of composites.** — Cambridge monographs on applied and computational mathematics, vol. 6. — Un vol. relié, 25×18, de xxviii, 719 p. — ISBN 0-521-78125-6. — Prix : £60.00. — Cambridge University Press, Cambridge, 2002.

The theory of composite materials is mathematically the study of partial differential equations with rapid oscillations in their coefficients. An explosion of ideas in the last four decades has dramatically increased our understanding of the relationship between the properties of the constituent materials, the underlying microstructure of a composite, and the overall effective moduli that govern the macroscopic behavior. This renaissance has been fueled by the technological need for improving our knowledge base of composites, by the advance of the underlying mathematical theory of homogenization, by the discovery of new variational principles, by the recognition of how important the subject is to solving structural optimization problems, and by the realization of the connection with the mathematical problem of quasiconvexification. This book surveys these exciting developments at the frontier of mathematics and presents many new results.

### *Systemes dynamiques et théorie ergodique*

Arno BERGER. — **Chaos and chance: an introduction to stochastic aspects of dynamics.** — De Gruyter textbook. — Un vol. relié, 18×25, de x, 245 p. — ISBN 3-11-016991-6. — Prix : € 49.95. — Walter de Gruyter, Berlin, 2001.

The book introduces the topologically oriented approach by discussing bifurcations, full and transient chaos, and symbolic dynamics. The statistical point of view is taken via ergodic and mixing properties, entropy, and a thorough discussion of the Frobenius-Perron operator. Markov chains serve as a means of bringing together both viewpoints, and basic concepts of the general dynamics of measures are presented as a concluding outlook. Theory is developed along a host of illustrative examples, with a few prominent examples like billiards serving as navigation beacons throughout. It is also by a number of challenging exercises that the interplay of chaos and chance will be experienced hands-on.

### *Équations aux différences finies, équations fonctionnelles*

B.G. PACHPATTE. — **Inequalities for finite difference equations.** — Pure and applied mathematics, vol. 247. — Un vol. relié, 16×24, de viii, 514 p. — ISBN 0-8247-0657-9. — Prix : US\$ 195.00. — Marcel Dekker, New York, 2002.

Featuring more than 200 references, *Inequalities for Finite Difference Equations* introduces a variety of new finite difference inequalities... discusses perturbations... describes applications to various types of finite difference and sum-difference equations... focuses on stability of finite difference systems... considers inequalities involving iterated sums... examines basic multidimensional finite difference inequalities... identifies bounds on the solutions of difference equations... and more.

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

Lokenath DEBNATH. — **Wavelet transforms and their applications.** — Un vol. relié, 17×24, de xv, 565 p. — ISBN 0-8176-4204-8. — Prix : SFr. 158.00. — Birkhäuser, Boston, 2002.

This book presents a systematic exposition of the basic ideas and results of wavelet transforms and their applications in time-frequency signal analysis and turbulence. Wavelets allow