

Analyse fonctionnelle

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expansions. An account of the basic analytical properties of Mellin-Barnes integrals and Mellin transforms and their use in applications ranging from number theory to differential and difference equations is followed by a systematic analysis of the asymptotics of Mellin-Barnes representations of many important special functions, including hypergeometric, Bessel and parabolic cylinder functions. An account of the recent developments in the understanding of the Stokes phenomenon and of hyperasymptotics in the setting of Mellin-Barnes integrals ensues. The book concludes with the application of ideas set forth in the earlier parts of the book to higher-dimensional Laplace-type integrals and sophisticated treatments of Euler-Jacobi series, the Riemann zeta function and the Pearcey integral.

Analyse fonctionnelle

Erik M. ALFSEN, Frederic W. SCHULTZ. — **State spaces of operator algebras: basic theory, orientations and C*-products.** — Mathematics: theory & applications. — Un vol. relié, 16×24, de XII, 350 p. — ISBN 0-8176-3890-3. — Prix: SFr. 128.00. — Birkhäuser, Boston, 2001.

This self-contained work, focusing on the theory of state spaces of C*-algebras and von Neumann algebras, explains how the oriented space geometrically determines the algebra. Key features include: first and only work devoted to state spaces of operator algebras – contains much material not available in existing books; prerequisites are standard graduate courses in real and complex variables, measure theory, and functional analysis; complete proofs of basic results on operator algebras presented so that no previous knowledge in the field is needed; detailed introduction develops basic tools used throughout the text; numerous chapter remarks on advanced topics of independent interest with references to the literature, or discussion of applications to physics.

Ron BLEI. — **Analysis in integer and fractional dimensions.** — Cambridge studies in advanced mathematics, vol. 71. — Un vol. relié, 16×23,5, de XIX, 556 p. — ISBN 0-521-65084-4. — Prix: £65.00. — Cambridge University Press, Cambridge, 2001.

The book's focus is on "dimension" as a basic counter of degrees of freedom. This focus leads to precise relations between combinatorial measurement and various indices originating from the classical inequalities of Khintchin, Littlewood and Grothendieck. The basic concepts of fractional Cartesian products and combinatorial dimension are introduced and linked to scales calibrated by harmonic-analytic and stochastic measurements. Topics include the (two-dimensional) Grothendieck inequality and its extensions to higher dimensions, multidimensional measure theory, stochastic models of Brownian motion, degrees of randomness and applications to random walks, and Fréchet measures in stochastic analysis.

A. K. KATSARAS, W. H. SCHIKHOF, L. VAN HAMME, (Editors). — **p-adic functional analysis: proceedings of the sixth international conference.** — Lecture notes in pure and applied mathematics, vol. 222. — Un vol. broché, 17,5×25,5, de VIII, 322 p. — ISBN 0-8247-0611-0. — Prix: US\$ 150.00. — Marcel Dekker, New York, 2001.

This volume collects lectures presented at the Sixth International Conference held at the University of Ioannina, Greece, on p-adic functional analysis with applications in the fields of physics, differential equations, number theory, probability theory, dynamical systems, and algebraic number fields – discussing the commutation relation $AB - BA = I$ and its central role in quantum mechanics. The book addresses orthogonal and Schauder bases and approximation of p-adic linear forms, describes compact perturbations of p-adic operators, vector measures, probabilistic measures, and nonarchimedean inner products... considers Banach-Stone theorems... reviews ultrametric Hopf algebras and embedding in Lebesgue spaces... and more.

Jun KIGAMI. — **Analysis on fractals.** — Cambridge tracts in mathematics, vol. 143. — Un vol. relié, 16×23,5, de VIII, 226 p. — ISBN 0-521-79321-1. — Prix: £35.00. — Cambridge University Press, Cambridge, 2001.

This book covers analysis on fractals, an area of mathematics which focuses on the dynamical aspects of fractals, such as heat diffusion on fractals and the vibration of a material with fractal structure. The book provides a self-contained introduction to the subject, starting from the basic geometry of self-similar sets and going on to discuss recent results, including the properties of eigenvalues and eigenfunctions of the Laplacians, and the asymptotical behavior of heat kernels on self-similar sets. Requiring only a basic knowledge of advanced analysis, general topology and measure theory, this book will be of value to graduate students and researchers in analysis and probability theory. It will also be useful as a supplementary text for graduate courses covering fractals.

Theodore W. PALMER. — **Banach algebras and the general theory of *-algebras, Vol. 2: *-Algebras.** — Encyclopedia of mathematics and its applications, vol. 79. — Un vol. relié, 16×24, de XI, 795-1616 p. — ISBN 0-521-36638-0. — Prix: £75.00. — Cambridge University Press, Cambridge, 2001.

This is the second volume of a two-volume set that provides a modern account of basic Banach algebra theory including all known results on general Banach *-algebras. This second volume deals with *-algebras. Chapter 9 develops the theory of *-algebras without additional restrictions, going well beyond what has been proved in this context previously. Chapter 10 proves nearly all of the results previously known for Banach *-algebras and hermitian Banach *-algebras for *-algebras with various essentially algebraic restrictions. It provides the first detailed, published version of these theories. Chapter 11 restates the previous results in terms of Banach *-algebras and uses them to prove results explicitly involving the complete norm. Chapter 12 is devoted to locally compact groups and the *-algebras related to them. Their classification in terms of properties shared by compact and abelian groups is explored in detail.

Hans TRIEBEL. — **The structure of functions.** — Monographs in mathematics, vol. 97. — Un vol. relié, 17×24, de XII, 425 p. — ISBN 3-7643-6546-3. — Prix: SFr. 148.00. — Birkhäuser, Basel, 2001.

This book deals with the constructive Weierstrassian approach to the theory of function spaces and various applications. The first chapter is devoted to a detailed study of quarkonial (subatomic) decompositions of functions and distributions on Euclidean spaces, domains, manifolds and fractals. This approach combines the advantages of atomic and wavelet representations. It paves the way to sharp inequalities and embeddings in function spaces, spectral theory of fractal elliptic operators, and a regularity theory of some semi-linear equations. The book is self-contained, although some parts may be considered as a continuation of author's book *Fractals and Spectra*.

Théorie des opérateurs

Daniel BELTIȚĂ, Mihai ȘABAC. — **Lie algebras of bounded operators.** — Operator theory: advances and applications, vol. 120. — Un vol. relié, 17×24, de VIII, 217 p. — ISBN 3-7643-6404-1. — Prix: SFr. 128.00. — Birkhäuser, Basel, 2001.

There is a fruitful and fascinating interaction between infinite dimensional operator theory (particularly decomposable, scalar and spectral generalized operator theory due to C. Foias and I. Colojoara) and Lie algebra theory. The present book is the first devoted to this field, ranging from some short historical notes to the most recent developments. Nilpotence criteria, infinite