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system. These systems are very robust in that they apply to many settings that do not fit into the scheme of conformal iterated systems. The basic theory is laid out here and the authors have touched on many natural questions arising in its context. However, they also emphasize the many issues and current research topics which can be found in original papers, for example the detailed analysis of the structure of harmonic measures of limit sets, the examination of the doubling property of conformal measures, the extensive study of generalized polynomial-like mapping or multifractal analysis of geometrically finite Kleinian groups.

Yuri B. SURIS. — **The problem of integrable discretization: Hamiltonian approach.** — Progress in mathematics, vol. 219. — Un vol. relié, 17×24, de XXI, 1070 p. — ISBN 3-7643-6995-7. — Prix: SFr. 228.00. — Birkhäuser, Basel, 2003.

The book explores the theory of discrete integrable systems, with an emphasis on the following general problem: how to discretize one or several of independent variables in a given integrable system of differential equations, maintaining the integrability property? This question (related in spirit to such a modern branch of numerical analysis as geometric integration) is treated in the book as an immanent part of the theory of integrable systems, also commonly termed as the theory of solitons. Among several possible approaches to this theory, the Hamiltonian one is chosen as the guiding principle. A self-contained exposition of the Hamiltonian (r-matrix, or “Leningrad”) approach to integrable systems is given, culminating in the formulation of a general recipe for integrable discretization of r-matrix hierarchies. The book is a kind of encyclopedia on discrete integrable systems. It unifies the features of a research monograph and a handbook. It is supplied with an extensive bibliography (about 700 items).

### *Approximations et développements en série*

Carlo BARDARO, Julian MUSIELAK, Gianluca VINTI. — **Nonlinear integral operators and applications.** — De Gruyter series in nonlinear analysis and applications, vol. 9. — Un vol. relié, 17,5×24,5, de XII, 201 p. — ISBN 3-11-017551-7. — Prix: € 88.00. — Walter de Gruyter, Berlin, 2003.

This book represents the first attempt at a comprehensive treatment of approximation theory by means of nonlinear integral operators in function spaces. In particular, the fundamental notions of approximate identity for kernels of nonlinear operators and a general concept of modulus of continuity are developed in order to obtain consistent approximation results. Applications to nonlinear summability, nonlinear integral equations and nonlinear sampling theory are given. In particular, the study of nonlinear sampling operators in various function spaces is important since the results permit the processing of several classes of signals. In a wider context, the material of this book represents a starting point for new areas of research in nonlinear analysis. For this reason the text is written in a style accessible not only to researchers but to advanced students as well.

Manfred REIMER. — **Multivariate polynomial approximation.** — International series of numerical mathematics, vol. 144. — Un vol. relié, 17×24, de X, 358 p. — ISBN 3-7643-1638-1. — Prix: SFr. 156.00. — Birkhäuser, Basel, 2003.

The book begins with an introduction to the general theory by presenting the most important facts on multivariate interpolation, quadrature, orthogonal projections and their summation, all treated under a constructive view, and embedded in the theory of positive linear operators. On this background, the book gives the first comprehensive introduction to the recently developed theory of generalized hyperinterpolation, which is a positive discrete polynomial approximation

method, combining reasonable cost and uniform convergence, in particular cases at the best possible approximation order. The theory is established first on the sphere under an intrinsic asymptotic investigation of the node and weight distribution of positive quadratures. Then it is carried over to the balls of lower dimension by an identification of certain Laplace and Appell series. As an application, the book gives a quick introduction to tomography and even a view on the  $k$ -plane transform.

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

Anders VRETBLAD. — **Fourier analysis and its applications.** — Graduate texts in mathematics, vol. 223. — Un vol. relié,  $16 \times 24$ , de XI, 269 p. — ISBN 0-387-00836-5. — Prix: € 64.95. — Springer, New York, 2003.

This book presents the basic ideas in Fourier analysis and its applications to the study of partial differential equations. It also covers the Laplace and zeta transformations and the fundamentals of their applications. The author has intended to make his exposition accessible to readers with a limited background, for example, those not acquainted with the Lebesgue integral or with analytic functions of a complex variable. At the same time, he has included discussions of more advanced topics such as the Gibbs phenomenon, distributions, Sturm-Liouville theory, Cesaro summability, and multidimensional Fourier analysis, topics that one usually will not find in books at this level.

### ***Analyse fonctionnelle***

Pierre LÉVY-BRUHL. — **Introduction à la théorie spectrale: cours et exercices corrigés, master 1<sup>re</sup> et 2<sup>e</sup> années, agrégation.** — Sciences sup. — Un vol. broché,  $17 \times 24$ , de X, 190 p. — 2-10-007072-X. — Prix: € 28.00. — Dunod, Paris, 2003.

La théorie spectrale, branche essentielle de l'analyse fonctionnelle, s'applique tant en mathématiques pures et appliquées, qu'en physique et en chimie. Destiné principalement aux étudiants, mais également aux chercheurs opérant dans d'autres branches des mathématiques, cet ouvrage présente les outils mathématiques de la théorie spectrale: passage de la dimension finie à la dimension infinie pour des opérateurs linéaires continus, théorie des opérateurs compacts et traçables, diverses formes du théorème spectral, théorie des opérateurs auto-adjoints non bornés (avec une étude détaillée du théorème spectral et de nombreux exemples reposant sur l'équation de Schrödinger). De nombreux exemples et des exercices d'application corrigés illustrent le cours.

Gilles PISIER. — **Introduction to operator space theory.** — London Mathematical Society lecture note series, vol. 294. — Un vol. broché,  $15,5 \times 23$ , de VII, 478 p. — ISBN 0-521-81165-1. — Prix: £ 39.95. — Cambridge University Press, Cambridge, 2003.

The theory of operator spaces is very recent and can be described as a non-commutative Banach space theory. An "operator space" is simply a Banach space with an embedding into the space  $B(H)$  of all bounded operators on a Hilbert space  $H$ . The first part of this book is an introduction with emphasis on examples that illustrate various aspects of the theory. The second part is devoted to applications to  $C^*$ -algebras, with a systematic exposition of tensor products of  $C^*$ -algebras. The third (and shortest) part of the book describes applications to non-self-adjoint operator algebras and similarity problems. In particular, the author's counterexample to the "Halmos problem" is presented, as well as work on the new concept of "length" of an operator algebra.