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signals, spectral analysis, wavelet transform from orthogonal spline wavelets, numerical modeling of Maxwell's equation, wavelet networks and nonlinear processes. It is addressed to an interdisciplinary readership of professional workers in applied mathematics, electrical engineers, physicists and other scientists interested in applying these new ideas and techniques.

Hans G. FEICHTINGER, Thomas STROHMER, (EDITORS). — **Gabor analysis and algorithms: theory and applications.** — Applied and numerical harmonic analysis. — Un vol. relié, 16 × 24, de xvi, 496 p. — ISBN 0-8176-3959-4. — Prix: SFr. 118.00. — Birkhäuser, Boston, 1998.

This book is a definitive survey of the subject showing the connections and interactions between theory, numerical algorithms, and applications. The first part of the book is devoted to the mathematical foundations of Gabor analysis, including Weyl-Heisenberg frames, duality conditions, the uncertainty principle, and the Balian-Low-Theorem as well as a group theoretical approach. The second part presents numerical algorithms and selected applications in signal and image processing.

W. FREEDEN, T. GERVEN, M. SCHREINER. — **Constructive approximation on the sphere: with applications to geomathematics.** — Numerical mathematics and scientific computation. — Un vol. relié, 15,5 × 24,5, de xv, 427 p. — ISBN 0-19-853682-8. — Prix: £65.00. — Clarendon Press, Oxford, 1998.

The subject of geomathematics focuses on the interpretation and classification of data from geoscientific and satellite sources, reducing information to a comprehensible form that allows for the testing of concepts and the solution of problems. The book bridges the existing gap between monographs on the special functions of mathematical physics and constructive approximation in Euclidean spaces. The primary objective is to provide readers with an understanding of aspects of approximation by spherical harmonics, such as spherical splines and wavelets, as well as indicating future directions of research. Scalar, vectorial, and tensorial methods are each considered in turn.

## *Analyse fonctionnelle et théorie des opérateurs*

Daniel ALPAY, Aad DIJKSMA, James ROVNYAK, Hendrik de SNOO. — **Schur functions, operator colligations, and reproducing kernel Pontryagin spaces.** — Operator theory: advances and applications, vol. 96. — Un vol. relié, 17,5 × 24, de xi, 229 p. — ISBN 3-7643-5763-0. — Prix: SFr. 128.00. — Birkhäuser Verlag, Basel, 1997.

This book develops the realization theory of generalized Schur functions as characteristic functions of coisometric, isometric, and unitary colligations whose state spaces are reproducing kernel Pontryagin spaces. This provides a modern system theory setting for the relationship between invariant subspaces and factorization, operator models, Krein-Langer factorizations, and other topics. An introductory chapter supplies background material, including reproducing kernel Pontryagin spaces, complementary spaces in the sense of de Branges, and a key result on defining operators as closures of linear relations.

Shavkat AYUPOV, Abdugafur RAKHIMOV and Shukhrat USMANOV. — **Jordan, real and Lie structures in operator algebras.** — Mathematics and its applications, vol. 418. — Un vol. relié, 16,5 × 24,5, de ix, 225 p. — ISBN 0-7923-4684-X. — Prix: Dfl. 340.00. — Kluwer Academic Publishers, Dordrecht, 1997.

The first purpose of the book is to study the deep structure theory for Jordan operator algebras similar to (complex) von Neumann algebras theory, such as type classification, traces,

conjugacy of automorphisms, injectivity, amenability, and semidiscreteness. The second aim is to investigate pure algebraic problems concerning Jordan and Lie structure in prime and simple rings with involution in the framework of operator algebras. These pure algebraic results give additional information on properties of single operators on a Hilbert space.

Albrecht BÖTTCHER, Yuri I. KARLOVICH. — **Carleson curves, Muckenhoupt weights, and Toeplitz operators.** — Progress in mathematics, vol. 154. — Un vol. relié, 16×24, de xv, 397 p. — ISBN 3-7643-5796-7 (Basel), 0-8176-5796-7 (Boston). — Prix: SFr. 98.00. — Birkhäuser Verlag, Basel, 1997.

This book is a self-contained exposition of the spectral theory of Toeplitz operators with piecewise continuous symbols and singular integral operators with piecewise continuous coefficients. It includes an introduction to Carleson curves, Muckenhoupt weights, weighted norm inequalities, local principles, Wiener-Hopf factorization, and Banach algebras generated by idempotents. Some basic phenomena in the field and the techniques for treating them came to be understood only in recent years and are comprehensively presented here for the first time.

M.L. GORBACHUK, V.I. GORBACHUK. — **M.G. Krein's lectures on entire operators.** — Operator theory: advances and applications, vol. 97. — Un vol. relié, 17,5×24, de ix, 220 p. — ISBN 3-7643-5704-5. — Prix: SFr. 118.00. — Birkhäuser Verlag, Basel, 1997.

The theory of entire operators lies at the junction of the spectral theory of Hermitian operators and the theory of analytic functions, harmoniously combining the methods of each. The purpose of the book is to show how various problems of classical and modern analysis can be looked at from the entire operator theory point of view. This is the first systematic presentation of basic concepts of Krein's theory and its applications. The present study of Krein's unpublished lectures and his works gives (over)due recognition to the unique approach he developed - an approach which for many years was not broadly known.

Reinhold MEISE, Dietmar VOGT. — **Introduction to functional analysis.** — Translated by M.S. Ramanujan. — Oxford graduate texts in mathematics, vol. 2. — Un vol. relié, 16×24, de x, 437 p. — ISBN 0-19-851485-9. — Prix: £47.50. — Clarendon Press, Oxford, 1997.

The book is written for students of mathematics and physics who have a basic knowledge of analysis and linear algebra. Starting from metric spaces it proceeds quickly to the central results of the field, including the theorem of Hahn-Banach. An introduction to locally convex spaces and their duality theory provides the basis for a comprehensive treatment of Fréchet spaces and their duals. In particular recent results on sequence spaces, linear topological invariants and short exact sequences of Fréchet spaces and the splitting of such sequences are presented. These results are not contained in any other book in this field.

Sakantha SINGH, Bruce WATSON, Pramila SRIVASTAVA. — **Fixed point theory and best approximation: the KKM-map principle.** — Mathematics and its applications, vol. 424. — Un vol. relié, 16,5×24,5, de x, 220 p. — ISBN 0-7923-4758-7. — Prix: Dfl. 180.00. — Kluwer Academic Publishers, Dordrecht, 1997.

The aim of this volume is to make available to a large audience recent material in nonlinear functional analysis that has not been covered in book format before. Here, several topics of current and growing interest are systematically presented, such as fixed point theory, best approximation, the KKM-map principle, and results related to optimization theory, variational inequalities and complementarity problems. Illustrations of suitable applications are given, the links between results in various fields of research are highlighted, and up-to-date bibliography is included to assist readers in further studies.

Hans TRIEBEL. — **Fractals and spectra: related to Fourier analysis and function spaces.** — Monographs in mathematics, vol. 91. — Un vol. relié, 17,5×24, de VIII, 271 p. — ISBN 3-7643-5776-2. — Prix: SFr. 128.00. — Birkhäuser Verlag, Basel, 1997.

This book deals with the symbiotic relationship between the theory of function spaces, fractal geometry, and spectral theory of (fractal) pseudodifferential operators as it has emerged quite recently. Atomic and quarkonial (subatomic) decompositions in scalar and vector valued function spaces on the Euclidean  $n$ -space pave the way to study properties (compact embeddings, entropy numbers) of function spaces on and of fractals. On this basis, distributions of eigenvalues of fractal (pseudo)differential operators are investigated. Diverse versions of fractal drums are played.

## *Calcul des variations*

Pablo PEDREGAL. — **Parametrized measures and variational principles.** — Progress in nonlinear differential equations and their applications, vol. 30. — Un vol. relié, 16×24, de VII, 212 p. — ISBN 3-7643-5697-9. — Prix: SFr. 88.00. — Birkhäuser Verlag, Basel, 1997.

The purpose of this book is to present a new approach to fundamental questions concerning the calculus of variations based on a systematic analysis of Young measures. Weak lower semi-continuity and relaxation are main areas of concentration in this work. The unified treatment of scalar and vector cases developed here is suitable also for more general situations. Applications to problems in continuum mechanics and nonlinear elasticity are analyzed in depth.

## *Géométrie*

Albrecht BEUTELSPACHER, Ute ROSENBAUM. — **Projective geometry: from foundations to applications.** — Un vol. broché, 15×23, de X, 258 p. — ISBN 0-521-48364-6. — Prix: £45.00. — Cambridge University Press, Cambridge, 1998.

This book presents the foundations of classical projective and affine geometry as well as its important applications in coding theory and cryptography. It could also serve as a first introduction to diagram geometry. Written in clear and contemporary language with an entertaining style and around 200 exercises, examples and hints, this book is ideally suited for use either as a textbook to accompany courses or for self-study.

David GAY. — **Geometry by discovery.** — Un vol. relié, 19,5×24,5, de XIV, 410 p. — ISBN 0-471-04177-7. — Prix: £24.95. — John Wiley, New York, 1998.

This book is a new approach to geometry. This ground-breaking text taps the pedagogical value of discovery to help students stretch their geometric perspective and hone their geometric intuition. It actively engages students in solving mathematical problems, and empowers them to be successful problem-solvers and discoverers of mathematical ideas.

J.W.P. HIRSCHFELD. — **Projective geometries over finite fields.** — Second edition. — Oxford mathematical monographs. — Un vol. relié, 16,5×24, de XIV, 555 p. — ISBN 0-19-850295-8. — Prix: £65.00. — Clarendon Press, Oxford, 1998.

This is a completely revised edition of the 1979 work with the same title. The original intention that the book be fully self-contained has yielded to the need to include theorems that are intrinsic to the topics but want deeper background results. The prerequisites for reading this book