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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

dimensional variants of Lie's theorem for solvable systems of bounded operators, spectral properties of elements of semisimple Lie algebras and simultaneous triangularisation are expounded. The book is self-contained and features an extensive bibliography. It is aimed at postgraduate students and researchers who are introduced to an interesting recent area of research and will learn some new methods useful for both of the domains – operator theory and Lie algebra theory.

Michael DEMUTH, Bert-Wolfgang SCHULZE, (Editors). — **Partial differential equations and spectral theory: PDE2000 Conference in Clausthal, Germany.** — Operator theory: advances and applications, vol. 126. — Un vol. relié, 17,5 × 24, de x, 353 p. — ISBN 3-7643-6219-7. — Prix: SFr. 148.00. — Birkhäuser, Basel, 2001.

The intention of the international conference PDE2000 was to bring together specialists from different areas of modern analysis, mathematical physics and geometry, to discuss not only the recent progress in their own fields but also the interaction between these fields. The special topics of the conference were spectral and scattering theory, semiclassical and asymptotic analysis, pseudodifferential operators and their relation to geometry, as well as partial differential operators and their connection to stochastic analysis and to the theory of semigroups.

A. DIJKSMA, M. A. KAASHOEK, A. C. M. RAN, (Editors). — **Recent advances in operator theory: the Israel Gohberg anniversary volume.** — International Workshop in Groningen, June 1998. — Operator theory: advances and applications, vol. 124. — Un vol. relié, 17 × 24, de IX, 558 p. — ISBN 3-7643-6573-0. — Prix: SFr. 198.00. — Birkhäuser, Basel, 2001.

This book contains 25 papers, most of which were presented, for the first time, at the International Workshop on Operator Theory and its Applications held in Groningen, The Netherlands, from June 30-July 3, 1998. The topics include dilation and interpolation problems, reproducing kernel spaces, numerical ranges of operators, Riccati equations, harmonic analysis, spectral theory of differential operators and analytic operator functions to scattering of waves. All papers deal with operators and analytic operators in Banach or Hilbert spaces, or in spaces with an indefinite metric. This book also contains the speeches held at the workshop dinner, a review of Israel Gohberg's contributions to mathematics and a complete list of his publications.

Mikhail KAMENSKIY, Valeri OBUKHOVSKII, Pietro ZECCA. — **Condensing multivalued maps and semilinear differential inclusions in Banach spaces.** — De Gruyter series in nonlinear analysis and applications, vol. 7. — Un vol. relié, 18 × 24,5, de xi, 231 p. — ISBN 3-11-016989-4. — Prix: DM 196.00. — Walter de Gruyter, Berlin, 2001.

The book is devoted to some directions of contemporary multivalued analysis. It begins with a detailed and elementary exposition of general properties of multivalued maps. Further special attention is paid to the class of condensing multimap, including the construction of topological degree theory, being an efficient machinery for solving operator including, fixed point and optimization problems. In the second part of the book the theory is applied to the investigation of semilinear differential inclusions in Banach spaces. The authors present results concerning the existence of local and global solutions as well as periodic trajectories. They describe qualitative properties of the solution sets and give applications to nonlinear control problems.

Nikolai KARAPETIANTS, Stefan SAMKO. — **Equations with involutive operators.** — Un vol. relié, 16,5 × 24, de xxii, 427 p. — ISBN 0-8176-4157-2. — Prix: SFr. 178.00. — Birkhäuser, Boston, 2001.

This text demonstrates an important interplay between abstract and concrete operator theory. The focus is on the investigation of a number of equations which, while seemingly different, are

all unified by the same idea: they are all realizations of some operator equations in Banach spaces. One permeating theme in these equations involves the role of the Fredholm property. The work is carefully written, is self-contained and covers a broad range of topics and results. Key ideas are developed in a step-by-step approach, beginning with the required background material and culminating in the final chapters with state-of-the art topics.

Nikolay D. KOPACHEVSKI, Selim G. KREIN. — **Operator approach to linear problems of hydrodynamics. Vol. 1: Self-adjoint problems for an ideal fluid.** — Operator theory: advances and applications, vol. 128. — Un vol. relié, 17×24, de xxiv, 384 p. — ISBN 3-7643-5406-2. — Prix: SFr. 248.00. — Birkhäuser, Basel, 2001.

This is the first volume of a set of two devoted to the operator approach to linear problems in hydrodynamics. It presents functional analytic methods applied to the study of small movements and normal oscillations of hydromechanical systems having cavities filled with either ideal or viscous fluids. The work is a sequel to and at the same time substantially extends the volume *Operator methods in linear hydrodynamics: evolution and spectral problems* by N.D. Kopachevsky, S.G. Krein and Ngo Zuy Kan, published in 1989 by Nauka in Moscow. It includes several new problems on the oscillations of partially dissipative hydrosystems and the oscillations of visco-elastic or relaxing fluids. The work relies on the authors' and their students' work of the last 30-40 years.

Carlos S. KUBRUSLY. — **Elements of operator theory.** — Un vol. relié, 16,5×24, de xiii, 527 p. — ISBN 0-8176-4174-2. — Prix: SFr. 128.00. — Birkhäuser, Boston, 2001.

This book is aimed at a new generation of researchers and graduate students who need to apply operator theory to their field. Written in a user-friendly, motivating style, fundamental topics are presented in a systematic fashion, i.e. set theory, algebraic structures, topological structures, Banach spaces, Hilbert spaces, culminating with the spectral theorem, one of the landmarks in the theory of operators on Hilbert spaces. The exposition is concept-driven and as much as possible avoids the formula-computational approach.

Calcul des variations

Arturo LOCATELLI. — **Optimal control: an introduction.** — Un vol. relié, 17,5×24, de viii, 294 p. — ISBN 3-7643-6408-4. — Prix: SFr. 68.00. — Birkhäuser, Basel, 2001.

The book reflects the author's experience of teaching control theory courses at a variety of levels over a span of thirty years. The level of exposition, the choice of topics, the relative weight given to them, the degree of mathematical sophistication, and the nature of the numerous illustrative examples, owe to the author's commitment to effective teaching. The book is suited for undergraduate/graduate students who have already been exposed to basic linear system and control theory and possess the calculus background usually found in any undergraduate curriculum in engineering.

Géométrie

Mauro BILIOTTI, Vikram JHA, Norman L. JOHNSON. — **Foundations of translation planes.** — Monographs and textbooks in pure and applied mathematics, vol. 243. — Un vol. relié, 16×23,5, de xv, 542 p. — ISBN 0-8247-0609-9. — Prix: US\$ 195.00. — Marcel Dekker, New York, 2001.

This book provides a comprehensive coverage of the construction and analysis of translation planes with regard to spreads, partial spreads. It coordinates structures, automorphisms, auto-