

Analyse fonctionnelle

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Analyse de Fourier, analyse harmonique abstraite

Juha HEINONEN. — **Lectures on analysis on metric spaces.** — Universitext. — Un vol. relié, 16,5×24, de x, 140 p. — ISBN 0-387-95104-0. — Prix: DM 79.00. — Springer, New York, 2001.

The purpose of this book is to communicate some of the recent work in the area while preparing the reader to study more substantial, related articles. The material can be roughly divided into three different types: classical, standard but sometimes with a new twist, and recent. The author first studies basic covering theorems and their applications to analysis in metric measure spaces. This is followed by a discussion on Sobolev spaces emphasizing principles that are valid in larger contexts. The last few sections of the book present a basic theory of quasisymmetric maps between metric spaces. Much of the material is relatively recent and appears for the first time in book format.

Massimo A. PICARDELLO. — **Harmonic analysis and integral geometry.** — Chapman & Hall/CRC research notes in mathematics, vol. 422. — Un vol. broché, 15,5×23,5. — ISBN 1-58488-183-6. — Prix: £49.99. — Chapman & Hall/CRC, Boca Raton, 2001.

Comprising a selection of expository and research papers, this book grew from presentations offered at July 1998 Summer University of Safi, Morocco – an annual, advanced research school and congress. It presents important recent advances in the fields of Radon transforms, integral geometry, and harmonic analysis on Lie groups and symmetric spaces. Several articles are devoted to the new theory of Radon transforms on trees.

Analyse fonctionnelle

José M. GRACIA-BONDÍA, Joseph C. VÁRILLY, Héctor FIGUEROA. — **Elements of noncommutative geometry.** — Birkhäuser advanced texts. — Un vol. relié, 16,5×24, de xvi, 685 p. — ISBN 0-8176-4124-6. — Prix: SFr. 118.00. — Birkhäuser, Boston, 2001.

Noncommutative geometry deals with the unification of mathematics under the aegis of the quantum apparatus, that is, the theory of operators and C^* -algebras. In recent years noncommutative geometry has been a rich topic of research with discoveries leading to an increasing number of applications in mathematics and theoretical physics. Very little has appeared in book form since Alain Connes' work in the early 90s to deal with this subject. *Elements of Noncommutative Geometry* fills an important gap in the literature. Rich in proofs, examples and exercises, the book is an introduction to the language and techniques of noncommutative geometry at a level suitable for graduates students, and also provides sufficient detail to be useful to physicists and mathematicians wishing to enter this rapidly growing field.

Roland HAGEN, Steffen ROCH, Bernd SILBERMANN. — **C^* -algebras and numerical analysis.** — Pure and applied mathematics, vol. 236. — Un vol. relié, 16×23,5, de 376 p. — ISBN 0-8247-0460-6. — Prix: US\$ 165.00. — Marcel Dekker, New York, 2000.

This book examines the relationship between C^* -algebras and numerical analysis; discusses fractality — covering asymptotic properties of approximation operators such as stability, regularizability, behavior of condition numbers, eigenvalues, pseudoeigenvalues, singular values, and Rayleigh quotients; and describes Fredholmness — focusing on algebras that arise from concrete approximation methods. *C^* -Algebras and Numerical Analysis*; presents Arveson's results culminating in a generalization of the Szegö limit theorem; introduces kernel and cokernel dimension for approximation sequences; outlines the lifting theorem and the structure of fractal lifting homomorphisms; studies piecewise continuous and quasicontinuous coefficients; details polynomial collocation and finite sections of band dominated operators; considers spectra,

pseudospectra, numerical ranges and their limiting sets; spotlights Moore-Penrose inverses and regularization of matrices and operators; surveys finite sections of Toeplitz operators, ... and more!

Théorie des opérateurs

Ravi P. AGARWAL, Maria MEEHAN, Donal O'REGAN. — **Fixed point theory and applications.** — Cambridge tracts in mathematics, vol. 141. — Un vol. relié, $16 \times 23,5$, de x, 170 p. — ISBN 0-521-80250-4. — Prix: £37.50. — Cambridge University Press, Cambridge, 2001.

This book provides a clear exposition of the flourishing field of fixed point theory. Starting from the basics of Banach's contraction theorem, most of the main results and techniques are developed: fixed point results are established for several classes of maps and the three main approaches to establishing continuation principles are presented. The theory is applied to many areas of current interest in analysis. Topological considerations play a crucial role, including a final chapter on the relationship with degree theory. The very extensive bibliography and close to 100 exercises mean that it can be used both as text and as a comprehensive reference work, currently the only one of its type.

D. ALPAY, V. VINNIKOV, (Editors). — **Operator theory, system theory and related topics: the Moshe Livšic anniversary volume.** — Operator theory advances and applications, vol. 123. — Un vol. relié, $17,5 \times 24$, de x, 567 p. — ISBN 3-7643-6523-4. — Prix: SFr. 228.00. — Birkhäuser, Basel, 2001.

The present selection of refereed papers is dedicated to Moshe Livšic on the occasion of his eightieth anniversary. It covers many areas of operator theory and its applications, reflecting the breadth and the profound impact of his work. In particular, some of his most recent ideas on 2D-systems are presented. Other contributions cover important avenues of modern operator theory in such fields as interpolation theory (also in the so-called nonstationary setting), direct and inverse problems for the string equation and for nonselfadjoint differential operators, operator models and function theory. The volume will appeal to a wide audience of pure and applied mathematicians, electrical engineers and theoretical physicists.

H. BART, I. GOHBERG, A.C.M. RAN, (Editors). — **Operator theory and analysis: the M.A. Kaashoek Anniversary Volume.** — Workshop in Amsterdam, November 12-14, 1997. — Operator theory, vol. 122. — Un vol. relié, $17,5 \times 24$, de xxxix, 433 p. — ISBN 3-7643-6499-8. — Prix: SFr. 198.00. — Birkhäuser, Basel, 2001.

The workshop focused on areas in mathematical and functional analysis where the ideas and results of M.A. Kaashoek played an important role. The papers of this volume cover a wide range of topics centered around factorization of matrix valued functions, interpolation theory, and spectral theory. Other papers deal with canonical systems of differential equations, operators in indefinite inner product spaces, and the effect of small delays on stability and control of partial differential equations. The book starts with biographical material and a list of publications of M.A. Kaashoek.

J. ELSCHNER, I. GOHBERG, B. SILBERMANN, (Editors). — **Problems and methods in mathematical physics: the Siegfried Prössdorf Memorial Volume.** — Proceedings of the 11th Conference on Problems and Methods in Mathematical Physics (TMP), Chemnitz (Germany), March 25-28, 1999. — Operator theory: advances and applications, vol. 121. — Un vol. relié, $17,5 \times 24$, de viii, 523 p. — ISBN 3-7643-6477-7. — Prix: SFr. 198.00. — Birkhäuser, Basel, 2001.

The main part of the book comprises original research papers. The topics range from integral and pseudodifferential equations, boundary value problems, operator theory, boundary element