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from the outset that this book concentrates on the case of single operators... Our concentration on single operator theory means that the techniques employed can, essentially, be developed within the framework of the book itself. Of course, it is not possible to make a presentation such as this one entirely self-contained...; it has been our intention to make this exiting area of operator theory accessible to newcomers and graduate students of mathematics with an ordinary background in analysis. This has influenced both our assumptions about the reader's background knowledge, and also the high degree of detail included in the proofs throughout the book. The modest prerequisites from functional analysis and operator theory that we required are collected in the appendix...

## ***Théorie des opérateurs***

V.M. ADAMYAN, I. GOHBERG, M. GORBACHUK, V. GORBACHUK, M.A. KAASHOEK, H. LANGER, G. POPOV, (Editors). — **Differential operators and related topics: proceedings of the Mark Krein International Conference on Operator Theory and Applications, Odessa, Ukraine, August 18-22, 1997, vol. 1.** — Operator theory, vol. 117. — Un vol. relié, 17×24, de ix, 420 p. — ISBN 3-7643-6287-1. — Prix: SFr. 198.00. — Birkhäuser, Basel, 2000.

This conference, which was dedicated to the 90<sup>th</sup> anniversary of the prominent mathematician Mark Krein focused on the main ideas, methods, results, and achievements of M.G. Krein. This first volume is devoted to the theory of differential operators and related topics. It opens with a description of the conference, biographical material and a number of survey papers about the work of M.G. Krein. The main part of the book consists of original research papers presenting the state of the art in the area of differential operators.

V.M. ADAMYAN, I. GOHBERG, M. GORBACHUK, V. GORBACHUK, M.A. KAASHOEK, H. LANGER, G. POPOV, (Editors). — **Operator theory and related topics: proceedings of the Mark Krein International Conference on Operator Theory and Applications, Odessa, Ukraine, August 18-22, 1997, vol. 2.** — Operator theory, vol. 118. — Un vol. relié, 17×24, de xxiv, 419 p. — ISBN 3-7643-6288-X. — Prix: SFr. 198.00. — Birkhäuser, Basel, 2000.

The present book is the second of the two volume proceedings of the Mark Krein International Conference on Operator Theory and Applications. It is devoted to operator theory and related topics. It opens with the bibliography of M.G. Krein and a number of survey papers about his work. The main part of the book consists of original research papers presenting the state of the art in operator theory and its applications. The two volumes will be of interest to a wide range of readership in pure and applied mathematics, physics and engineering sciences.

Jürgen APPELL, (Editor). — **Recent trends in nonlinear analysis: Festschrift dedicated to Alfonso Vignoli on the occasion of his sixtieth birthday.** — Progress in nonlinear differential equations and their applications, vol. 40. — Un vol. relié, 16×24, de 264 p. — ISBN 3-7643-6292-8. — Prix: SFr. 128.00. — Birkhäuser, Basel, 2000.

The book contains a collection of 21 original research papers which report on recent developments in various fields of nonlinear analysis. The collection covers a large variety of topics ranging from abstract fields such as algebraic topology, functional analysis, operator theory, spectral theory, analysis on manifolds, partial differential equations, boundary value problems, geometry of Banach spaces, measure theory, variational calculus, and integral equations, to more application-oriented fields like control theory, numerical analysis, mathematical physics, mathematical economy, and financial mathematics. This book is addressed to all specialists interested in nonlinear functional analysis and its applications.

A.V. BALAKRISHNAN, (Editor). — **Semigroups of operators: theory and applications.** — International conference in Newport Beach, December 14-18, 1998. — Progress in nonlinear differential equations and their applications, vol. 42. — Un vol. relié,  $16,5 \times 24$ , de v, 367 p. — ISBN 3-7643-6310-X. — Prix: SFr. 148.00. — Birkhäuser, Basel, 2000.

This volume contains a collection of refereed papers by eminent experts originating from the “International Conference on Semigroups of Operators: Theory and Control”, held in December 1998 in Newport Beach, California. They highlight recent advances in the theory of semigroups of operators which provide the framework for the time-domain solutions of time-invariant boundary value and initial value problems of partial differential equations. There is a firewall between the abstract theory and the applications, and one of the conference aims, which is reflected in this collection, was to bring them together for the benefit of both communities.

Hari BERCOVICI, Ciprian FOIAS, (Editors). — **Operator theory and interpolation: International Workshop on Operator Theory and Applications, IWOTA 96.** — Operator theory: advances and applications, vol. 115. — Un vol. relié,  $17 \times 24$ , de 309 p. — ISBN 3-7643-6229-4. — Prix: SFr. 148.00. — Birkhäuser, Basel, 2000.

Systems and control theories use sophisticated operator theoretical methods. They also provide new ideas and problems in operator theory. As a consequence, the biannual MTNS (Mathematical Theory of Networks and Systems) Conference is attended by many operator theorists. At the initiative of J. W. Helton and I. Gohberg, an International Workshop on Operator Theory and Applications (IWOTA) has been organized since the early 80s, as a satellite of MTNS. The articles in this volume originated from the IWOTA conference held at Indiana University, Bloomington, in June 1996. They represent most of the areas that were discussed at the workshop with some emphasis on modern interpolation theory, a topic which has seen much progress in recent years.

Albrecht BÖTTCHER, Sergei M. GRUDSKY. — **Toeplitz matrices, asymptotic linear algebra, and functional analysis.** — Un vol. broché,  $17 \times 24$ , de x, 116 p. — ISBN 3-7643-6290-1. — Prix: SFr. 48.00. — Birkhäuser, Basel, 2000.

This text is a self-contained introduction to some problems for Toeplitz matrices that are placed in the borderland between linear algebra and functional analysis. The text looks at Toeplitz matrices with rational symbols, and focuses attention on the asymptotic behavior of the singular values, which includes the behavior of the norms, the norms of the inverses, and the condition numbers as special cases. The text illustrates that the asymptotics of several linear algebra characteristics depend in a fascinating way on functional analytic properties of infinite matrices. Many convergence results can very comfortably be obtained by working with appropriate  $C^*$ -algebras, while refinements of these results, for example, estimates of the convergence speed, nevertheless require hard analysis.

Israel GOHBERG, Seymour GOLDBERG, Nahum KRUPNIK. — **Traces and determinants of linear operators.** — Operator theory: advances and applications, vol. 116. — Un vol. relié,  $17 \times 24$ , de VIII, 258 p. — ISBN 3-7643-6177-8. — Prix: SFr. 148.00. — Birkhäuser, Basel, 2000.

This book is dedicated to a theory of traces and determinants on embedded algebras of linear operators, where the trace and determinant are extended from finite rank operators by a limit process. An attractive feature of this book is that it contains the charming classical theory of determinants together with its most recent concrete and abstract developments and applications. The general presentation of the book is based on the authors' work.

Victor P. HAVIN, Nikolai K. NIKOLSKI, (Editors). — **Complex analysis, operators, and related topics: the S.A. Vinogradov Memorial Volume.** — Operator theory, vol. 113. — Un vol. relié, 17×24, de ix, 408 p. — ISBN 3-7643-6214-6. — Prix: SFr. 168.00. — Birkhäuser, Basel, 2000.

The main subjects of the volume include: — Free interpolation by analytic functions in its development from the works by L. Carleson up to the most recent achievements and in its connections with the theory of singular integral operators and Carleson-type embedding theorems, moment problems, etc. — Szökefalvi-Nagy-Foias model spaces studied from the point of view of holomorphic spaces. — Holomorphic spaces (Hardy, Bergman, Hölder, and Sobolev spaces). — Analytic functions smooth up to the boundary with their subtle properties related to the Nevanlinna-Smirnov factorization, division and multiplication, and zero sets. — A new approach to weighted inequalities for singular integrals based on the Bellman function in optimization theory. — The uncertainty principle in harmonic analysis and, in particular, a complete version of Turan's lemma on trigonometric sums. — Hankel operators and stationary Gaussian processes. — Fourier multipliers, and spectral analysis of some differential operators.

Haakan HEDENMALM, Boris KORENBLUM, Kehe ZHU. — **Theory of Bergman spaces.** — Graduate texts in mathematics, vol. 199. — Un vol. relié, 16×25, de ix, 286 p. — ISBN 0-387-98791-6. — Prix: DM 109.00. — Springer, New York, 2000.

Research interest and research activity in the theory of Bergman spaces have been high for several years. Today there are rich theories describing the Bergman spaces and their operators. This book presents the latest developments in the area. A self-contained book, with exercises at the end of each chapter, the *Theory of Bergman Spaces* will not only benefit graduate students but researchers also. — *Contents:* The Bergman spaces. — The Berezin transform. —  $A^p$ -inner functions. — Zero sets. — Interpolation and sampling. — Invariant subspaces. — Cyclicity. — Invertible noncyclic functions. — Logarithmically subharmonic weights.

Vladimir MAZ'YA, Serguei NAZAROV, Boris PLAMENEVSKIJ, (Editors). — **Asymptotic theory of elliptic boundary value problems in singularly perturbed domains, volume I and II.** — Translated from the German by Georg Heinig, Christian Posthoff and Boris Plamenevskij. — Operator theory, vol. 111 and vol. 112. — Deux vol. reliés, 17×24, de xxiii, 435 p et xxiii, 323 p. respectivement. — ISBN 3-7643-6397-5 (vol. 1), 3-7643-6398-3 (vol. 2). — Prix: SFr. 228.00, chaque volume, ou SFr. 398.00 pour l'ensemble. — Birkhäuser, Basel, 2000.

For the first time in mathematical literature this two-volume work introduces a unified and general approach to the asymptotic analysis of elliptic boundary value problems in singularly perturbed domains. The first volume is devoted to domains whose boundary is smooth in the neighbourhood of finitely many conical points. In particular, the theory encompasses the important case of domains with small holes. The second volume, on the other hand, treats perturbations of the boundary in higher dimensions as well as nonlocal perturbations. The core of this book consists of the solution of general elliptic boundary value problems by complete asymptotic expansion in powers of a small parameter that characterizes the perturbation of the domain. The construction of this method capitalizes on the theory of elliptic boundary value problems with nonsmooth boundary that has been developed in the past thirty years. Much attention is paid to concrete problems in mathematical physics, for example in elasticity theory. In particular, a study of the asymptotic behavior of stress intensity factors, energy integrals and eigenvalues is presented. To a large extent the book is based on the authors' work and has no significant overlap with other books on the theory of elliptic boundary value problems.

Bryan P. RYNNE, Martin A. YOUNGSON. — **Linear functional analysis.** — Springer undergraduate mathematics series. — Un vol. broché,  $17 \times 23,5$ , de x, 273 p. — ISBN 1-85233-257-3. — Prix: DM 59.00. — Springer, London, 2000.

Providing an introduction to the ideas and methods of linear functional analysis, this book shows how familiar and useful concepts from finite-dimensional linear algebra can be extended or generalized to infinite-dimensional spaces. In the initial chapters the theory of infinite-dimensional normed spaces (in particular Hilbert spaces) is developed, while in later chapters the emphasis shifts to studying operators between such spaces. Functional analysis has applications to a vast range of areas of mathematics; the final chapter discusses the two particularly important areas of integral and differential equations.

## *Calcul des variations*

Richard VINTER. — **Optimal control.** — Systems & control: foundations & applications. — Un vol. relié,  $16 \times 24$ , de xv, 507 p. — ISBN 0-8176-4075-4. — Prix: SFr. 138.00. — Birkhäuser, Boston, 2000.

Optimal control emerged as a distinct field of research only in recent decades. It provides a unified perspective of optimization problems, arising in scheduling and the control of engineering devices, that are beyond the reach of traditional analytical and computational techniques. In addition, the field has contributed significant advances to branches of applied mathematics and broad applications in process control, scheduling, robotics, resource economics, and other areas. This book brings together many of the important advances in 'nonsmooth' optimal control over the last two decades concerning necessary conditions, minimizer regularity and global optimality conditions associated with the Hamilton-Jacobi equation. The book's development and analysis is largely self-contained and incorporates many simplifications and unifying features for subjects' key concepts and foundations. This new book is an essential resource for an authoritative and comprehensive presentation of the foundations and applications of nonsmooth optimal control.

## *Géométrie*

Claude-Alain FAURE and Alfred FRÖLICHER. — **Modern projective geometry.** — Mathematics and its applications, vol. 521. — Un vol. relié,  $16,5 \times 24,5$ , de xvii, 363 p. — ISBN 0-7923-6525-9. — Prix: Dfl. 270.00. — Kluwer Academic Publishers, Dordrecht, 2000.

This monograph develops projective geometries and provides a systematic treatment of morphisms. It is unique in that it does not confine itself to isomorphisms. This work introduces a new fundamental theorem and its applications describing homogeneous co-ordinates as morphisms of projective geometries by semilinear maps. Other topics treated include three equivalent definitions of projective geometries and isomorphism theorems, recent results in dimension theory, morphisms and homomorphisms of projective geometries, special morphisms, duality theory, morphisms of affine geometries, polarities, orthogonalities, Hilbertian geometries and propositional systems. The book concludes with a large section of exercises.

Richard HARTLEY, Andrew ZISSERMAN. — **Multiple view geometry in computer vision.** — Un vol. relié,  $18 \times 25$ , de xvi, 607 p. — ISBN 0-521-62304-9. — Prix: £60.00. — Cambridge University Press, Cambridge, 2000.

A basic problem in computer vision is to reconstruct a real world scene given several images of it. This book describes techniques for solving this problem which have been developed from projective geometry and photogrammetry. Recent major developments in the theory and practice