decomposition; algorithms and numerical examples implemented in MATLAB®; discusses the design of wavelet bases and details how to implement the transform both in hardware and software; covers the fundamentals and the developments of the links between areas such as time-frequency analysis, digital signal processing, image processing, and Fourier and wavelet transforms, both continuous and discrete; offers extended mathematical treatment and numerous examples, with particular emphasis on the transition from the continuous domain to multi-resolution and subband.

Peter BORWEIN. — **Computational excursions in analysis and number theory**. — CMS books in mathematics. — Un vol. relié, 16×24, de x, 220 p. — ISBN 0-387-95444-9. — Prix: € 69.95. — Springer, New York, 2002.

This book is designed for a computationally intensive graduate course based around a collection of classical unsolved extremal problems for polynomials. These problems, all of which lend themselves to extensive computational exploration, live at the interface of analysis, combinatorics, and number theory, so the techniques involved are diverse. A main computational tool used is the LLL algorithm for finding small vectors in a lattice. Many exercises and open research problems are included. Indeed, one aim of the book is to tempt the able reader into the rich possibilities for research in this area.

Analyse fonctionnelle

Boris BUFFONI, John TOLAND. — **Introduction à la théorie globale des bifurcations.** — Cahiers mathématiques de l'Ecole polytechnique fédérale de Lausanne. — Un vol. broché, 15×21, de x, 130 p. — ISBN 2-88074-494-6. — Prix: SFr. 49.50. — Presses polytechniques et universitaires romandes, Lausanne, 2002.

L'ouvrage expose et justifie le *principe de linéarisation,* à savoir que les petites solutions d'une équation différentielle sont bien décrites par les fonctions propres du problème linéarisé. Le cadre abstrait est celui du calcul différentiel dans les espaces de Banach et le résultat principal et le fameux théorème de bifurcation de Crandall-Rabinowitz. Il présente ensuite, dans le langage des analystes, la théorie des germes d'ensembles analytiques, qui a pour objet la structure locale des solutions d'un système d'équations analytiques de plusieurs variables. Grâce à cette structure, le principe de linéarisation peut être étendu aux solutions de grande taille et fournir un théorème global de bifurcation plus précis que celui obtenu par des arguments topologiques.

Michael CWIKEL, Miroslaw ENGLIŠ, Alois KUFNER, Lars-Erik PERSSON, Gunnar SPARR, (Editors). — **Function spaces, interpolation theory and related topics.** — Proceedings of the International Conference in honour of Jaak Peetre on his 65th birthday, Lund, Sweden, August 17-22, 2000. — Un vol. relié, 18×24,5, de x, 462 p. — ISBN 3-11-017117-1. — Prix: € 128.97. — Walter de Gruyter, Berlin, 2002.

Jaak Peetre is one of the founders of the theory of interpolation spaces and a brilliant contributor to several other areas of mathematics. The articles cover a wide range of topics both from interpolation theory and from other fields where Jaak Peetre's ideas and results have left an indelible mark: the theory of function spaces; Hankel-type and related operators; analysis on bounded symmetric domains; PDEs; and special functions. The book opens with biographical material and a list of Peetre's publications, followed by his paper on the history of the "birth" of the theory of interpolation, and by a paper of the late co-founder of this theory, Jacques-Louis Lions, on reproducing kernels.

Ricardo ESTRADA, Ram P. KANWAL. — **A distributional approach to asymptotics: theory and applications**. — Second edition. — Birkhäuser Advanced Texts. — Un vol. relié, 24×16, de XIV, 451 p. — ISBN 0-8176-4142-4. — Prix: SFr. 158.00. — Birkhäuser, Boston, 2002.

This book is a modern introduction to asymptotic analysis intended not only for mathematicians, but for physicists, engineers, and graduate students as well. Written by two of the leading experts in the field, the text provides readers with a firm grasp of mathematical theory, and at the same time demonstrates applications in areas such as differential equations, quantum mechanics, noncommutative geometry, and number theory. — *Key features of this significantly expanded and revised second edition:* addition of a new chapter and many new sections; wide range of topics covered, including the Cesàro behavior of distributions and their connections to asymptotic analysis, the study of time-domain asymptotics, and the use of series of Dirac delta functions to solve boundary value problems; novel approach detailing the interplay between underlying theories of asymptotic analysis and generalized fuctions; extensive examples and exercises at the end of each chapter; comprehensive bibliography and index.

Peter D. LAX. — **Functional analysis.** — Pure and applied mathematics. — Un vol. relié, 16×24, de XIX, 580 p. — ISBN 0-471-55604-1.— Prix: £66.95. — J. Wiley, Chichester, 2002.

This book combines theories and applications to demonstrate how the functional analytic point of view helps to clarify and solve mathematical problems. The first part describes Banach spaces and their duals, weak sequential and weak topologies, the Krein-Milman theorem, the Gelfand theory of commutative Banach algebras, compact operators, and invariant subspaces. The second part presents trace formulas, the Fredholm determinant and its generalizations, the spectral resolution and representation of selfadjoint operators, the theory of one-parameter semigroups, scattering theory, and many other topics. The appendices give a functional analytic proof of the Riesz-Kakutani representation theorem and outline compactly the theory of distributions and some of its applications. Numerous exercises and an extensive bibliography are given.

Eugeny SMIRNOV. — **Hausdorff spectra in functional analysis.** — Springer monographs in mathematics. — Un vol. relié, 16×24, de VIII, 209 p. — ISBN 1-85233-571-8. — Prix: € 89.95. — Springer, London, 2002.

Self-contained and collating for the first time material that has until now only been published in journals – often in Russian – this book will be of interest to functional analysts, especially those with interests in topological vector spaces, and to algebraists concerned with category theory. The text has been revised and expanded in this English translation of the Russian original, including more background material and fewer references to material in journals.

Théorie des opérateurs

Albrecht BÖTTCHER, Yuri I. KARLOVICH, Ilya M. SPITKOVSKY. — **Convolution operators and factorization of almost periodic matrix functions**. — Operator theory , vol. 131. — Un vol. relié, 17×24, de XI, 462 p. — ISBN 3-7643-6672-9. — Prix: SFr. 168.00. — Birkhäuser, Basel, 2002.

This book is an introduction to convolution operators with matrix-valued almost periodic or semi-almost periodic symbols. The basic tools for the treatment of the operators are Wiener-Hopf factorization and almost periodic factorization. These factorizations are systematically investigated and explicitly constructed for interesting concrete classes of matrix functions. The material covered by the book ranges from classical results through a first comprehensive presentation of the core of the theory of almost periodic factorization up to the latest achievements, such as the construction of factorizations by means of the Portuguese transformation and the solution of corona theorems.