Analyse numérique

dienen Tips und Querverweise sowie ein sehr ausführliches und strukturiertes Sachverzeichnis mit einer Fülle erläuterter Stichworte auch zur Ergänzung von Statistik-Software-Handbüchern, insbesondere für Mediziner, Ingenieure und Naturwissenschaftler.

Neil H. TIMM. — **Applied multivariate analysis**. — Springer texts in statistics. — Un vol. relié, 18,5×24, de XXIV, 693 p. — ISBN 0-387-95347-7. — Prix: €89.95. — Springer, New York, 2002.

The presentation integrates theory and practice including both the analysis of formal linear multivariate models and exploratory data analysis techniques. Each chapter contains the development of basic theoretical results with numerous applications illustrated using examples from the social and behavioral sciences as well as from other disciplines. All examples are analyzed using SAS. The book includes an overview of vectors, matrices, multivariate distribution theory, and multivariate linear models. Topics discussed include multivariate regression, multivariate analysis of variance for fixed and mixed models, seemingly unrelated regression models, and repeated measurement models. While standard procedures for estimating model parameters and testing multivariate hypotheses, as well as simultaneous test procedures, are discussed, the text also includes tests of multivariate normality with chi-square and beta plots, tests of multivariate nonadditivity, tests of covariance structure, tests of nonnested hypotheses, and the assessment of model assumptions. Other topics discussed include discriminant and classification analysis, principal component analysis, canonical correlation analysis, exploratory factor analysis, cluster analysis, multidimensional scaling, and structural equation modeling.

Analyse numérique

H. M. ANTIA. — **Numerical methods for scientists and engineers.** — Second edition. — Un vol. broché, 19×25, de XXII, 842 p. — ISBN 3-7643-6715-6. — Prix: SFr. 79.00. — Birkhäuser, Boston, 2002.

This book presents an exhaustive and in-depth exposition of the various numerical methods used in scientific and engineering computations. It emphasizes the practical aspects of numerical computation and discusses various techniques in sufficient detail to enable their implementation in solving a wide range of problems. — *Features:* techniques for error-estimation in all cases of numerical computation discussed; limitations and pitfalls of various algorithms described; comparative study of different numerical techniques provided; pathological or difficult problems discussed; advanced topics like multiple integration, optimization and integral equations discussed; over 100 worked out examples illustrating numerical algorithms and their limitations/pitfalls; over 500 unsolved problems with answers; over 200 FORTRAN and C programs covering all topics; accompanying CD containing the FORTRAN and C programs and examples of usage.

Tobin A. DRISCOLL and Lloyd N. TREFETHEN. — **Schwarz-Christoffel mapping.** — Cambridge monographs on applied and computational mathematics, vol. 8. — Un vol. relié, 15,5×23,5, de XVI, 132 p. — ISBN 0-521-80726-3. — Prix: £30.00. — Cambridge University Press, Cambridge, 2002.

This book provides a comprehensive look at the Schwarz-Christoffel transformation, including its history and foundations, practical computation, common and less common variations, and many applications in fields such as electromagnetism, fluid flow, design and inverse problems, and the solution of linear systems of equations. The most important theoretical results are stated and proved, but the emphasis throughout remains on concrete understanding and implementation, as evidenced by the 76 figures based on quantitatively correct illustrative examples. There are more than 150 classical and modern reference works cited for readers needing more details.

Prem K. KYTHE, Pratap PURI. — **Computational methods for linear integral equations**. — Un vol. broché, 16×24, de XVIII, 508 p. — ISBN 0-8176-4192-0. — Prix: SFr. 190.00. — Birkhäuser, Boston, 2002.

This book presents basic theoretical material that deals with numerical analysis, convergence, error estimates, and accuracy. The unique computational aspect leads the reader from theoretical and practical problems all the way through to computation with hands-on guidance for input files and the execution of computer programs. — *Features:* offers all supporting *Mathematica* files related to the book via the Internet at the authors' web sites: www.math.uno.edu/fac/pkythe.html or www.math.uno.edu/fac/ppuri.html; contains identification codes for problems, related methods, and computer programs that are cross-referenced throughout the book to make the connections easy to understand; illustrates a how-to approach to computational work in the development of algorithms, construction of input files, timing, and accuracy analysis; covers linear integral equations of Fredholm and Volterra types of the first and second kinds as well as associated singular integral equations, integro-differential equations, and eigenvalue problems; provides clear, step-by-step guidelines for solving difficult and complex computational problems.

Denis SERRE. — **Matrices: theory and applications**. — Graduate texts in mathematics, vol. 216. — Un vol. relié, 16×24, de XV, 202 p. — ISBN 0-387-95460-0. — Prix: €49.95. — Springer, New York, 2002.

Denis Serre provides a clear and concise introduction to the basic theory of matrices. He discusses many interesting applications of matrices to different aspects of mathematics and provides a detailed analysis of classical algorithms used in large-scale computation. The book combines algebra, analysis, complexity theory, and numerical analysis, and it will provide many scientists, not just mathematicians, with a useful and reliable reference. Based on a course given by the author at the École Normale Supérieure de Lyon, the book is intended for advanced undergraduate and graduate students with either applied or theoretical goals.

Informatique

Joel S. COHEN. — **Computer algebra and symbolic computation: elementary algorithms**. — Un vol. relié, 24×16, de XVII, 323 p. — ISBN 1-56881-158-6. — Prix: US$50.00. — A.K. Peters, Natick, Massachusetts, 2002.

The author explores the structure and implementation of computer algebra algorithms as well as the mathematical and computational concepts behind them. This book bridges the gap between software manuals, which only explain how to use computer algebra programs such as *Mathematica, Maple, Derive*, etc., and graduate level texts, which only describe algorithms. For a more advanced look at computer algebra, including the application of algorithms to methods such as automatic simplification, polynomial decomposition, and polynomial factorization, see *Computer Algebra and Symbolic Computation: Mathematical Methods*.

Mécanique des fluides, acoustique

C.I. CHRISTOV, A. GURAN, (Editors). — **Selected topics in nonlinear wave mechanics**. — Un vol. relié, 24×16, de XII, 263 p. — ISBN 0-8176-4059-2. — Prix: SFr. 198.00. — Birkhäuser, Boston, 2002.

This comprehensive reference text gives an overview of the current state of nonlinear wave mechanics in both elastic and fluid media. Consisting of self-contained chapters, the book covers new aspects on strong discontinuities (shock waves) and localized self-preserving (permanent)