

# Fonctions d'une variable complexe

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devoted to the study of global loops. So far books on differentiable loops deal with local loops, and in contrast to Lie groups for non-associative local structures there are, in general, no global forms.

### ***Groupes topologiques; groupes et algèbres de Lie***

Andrew BAKER. — **Matrix groups: an introduction to Lie group theory.** — Springer undergraduate mathematics series. — Un vol. broché,  $17 \times 24$ , de XI, 330 p. — ISBN 1-85233-470-3. — Prix: € 34.95. — Springer, London, 2002.

The main focus is on matrix groups, i.e., closed subgroups of real and complex general linear groups. The first part studies examples and describes the classical families of simply connected compact groups. The second part introduces the idea of a Lie group and studies the associated notion of a homogeneous space using orbits of smooth actions. Throughout, the emphasis is on providing an approach that is accessible to readers equipped with a standard undergraduate toolkit of algebra and analysis.

Andrew PRESSLEY, (Editor). — **Quantum groups and Lie theory.** — London Mathematical Society lecture notes series, vol. 290. — Un vol. broché,  $15 \times 22,5$ , de VIII, 234 p. — ISBN 0-521-01040-3. — Prix: £ 27.95. — Cambridge University Press, Cambridge, 2001.

To discuss the most fruitful directions for future research, many of the world's leading figures in the area of quantum groups met at the Durham Symposium on Quantum Groups in the summer of 1999, and this volumes provides an excellent overview of the material presented there. It includes important surveys of both cyclotomic Hecke algebras and the dynamical Yang-Baxter equation. Plus contributions that treat the construction and classification of quantum groups of the associated solutions of the quantum Yang-Baxter equation. The representation theory of quantum groups is discussed, as is the function algebra approach to quantum groups, and there is a new look at the origins of quantum groups in the theory of integrable systems.

### ***Fonctions de variables réelles***

Piotr MIKUSIŃSKI, Michael D. TAYLOR. — **An introduction to multivariable analysis from vector to manifold.** — Un vol. relié,  $24 \times 16$ , de X, 295 p. — ISBN 0-8176-4234-X. — Prix: SFr. 136.00. — Birkhäuser, Boston, 2002.

The main topics of the book are: systematic exposition supported by numerous examples and exercises from the computational to the theoretical; brief development of linear algebra in  $\mathbf{R}^N$ ; review of the elements of metric space theory; treatment of standard multivariable material: differentials as linear transformations, the inverse and implicit function theorems; Taylor's theorem, the change of variables for multiple integrals; Lebesgue integration introduced in a concrete way rather than via measure theory; later chapters move beyond  $\mathbf{R}^N$  to manifolds and analysis on manifolds, covering the wedge product, differential forms, and the generalized Stokes' theorem.

### ***Fonctions d'une variable complexe***

Roger GODEMENT. — **Analyse mathématique III: fonctions analytiques, différentielles et variétés, surfaces de Riemann.** — Un vol. broché,  $15,5 \times 23,5$ , de IX, 338 p. — ISBN 3-540-66142-5. — Prix: € 42.61. — Springer, Berlin, 2002.

Les volumes 3 et 4 de cet ouvrage traitent principalement des fonctions analytiques (théorie de Cauchy, théorie analytique des nombres et fonctions modulaires), ainsi que du calcul différentiel sur les variétés, avec un exposé de l'intégrale de Lebesgue, en suivant d'assez près le célèbre cours donné longtemps par l'auteur à l'Université Paris VII. On reconnaîtra dans ce nouvel ouvrage le style inimitable de l'auteur, et pas seulement par son refus de l'écriture condensée en usage dans de nombreux manuels.

Yue Kuen KWOK. — **Applied complex variables for scientists and engineers.** — Un vol. broché, 15×23, de xi, 392 p. — ISBN 0-521-00462-4. — Prix: £19.95. — Cambridge University Press, Cambridge, 2002.

This is an introduction to complex variable methods for scientists and engineers. It begins by carefully defining complex numbers and analytic functions, and proceeds to give accounts of complex integration, Taylor series, singularities, residues and mappings. Both algebraic and geometric tools are employed to provide the greatest understanding, with many diagrams illustrating the concepts introduced. The emphasis is laid on understanding the use of methods, rather than on rigorous proofs. One feature that will appeal to scientists is the high proportion of the book devoted to applications of the material to physical problems. These include detailed treatments of potential theory, hydrodynamics, electrostatics, gravitation and the uses of the Laplace transform for partial differential equations. The text contains some 300 stimulating exercises of high quality, with solutions given to many of them.

### *Équations différentielles ordinaires*

A. A. MARTYNYUK. — **Qualitative methods in nonlinear dynamics: Novel approaches to Liapunov's matrix functions.** — Pure and applied mathematics, vol. 246. — Un vol. relié, 16×24, de x, 301 p. — ISBN 0-8247-0735-4. — Prix: US\$150.00. — New York, Marcel Dekker, 2002.

This monograph presents new approaches to qualitative analysis of continuous, discrete-time, and impulsive nonlinear systems via Liapunov matrix-valued functions that introduce more effective tests for solving problems of estimating the domains of asymptotic stability. The book discusses innovative methods of initial system decomposition... focuses on exponential polystability of separable motions as well as integral and Lipschitz stabilities... considers problems of dynamics of nonlinear systems in the presence of impulsive perturbations... outlines the comparison principle and advantages of cone-valued Liapunov functions... and more.

### *Équations aux dérivées partielles*

S.N. ANTONTSEV, J.I. DÍAZ, S. SHMAREV. — **Energy methods for free boundary problems: applications to nonlinear PDEs and fluid mechanics.** — Progress in nonlinear differential equations and their applications, vol. 48. — Un vol. relié, 17×24, de xi, 329 p. — ISBN 0-8176-4123-8. — Prix: SFr. 178.00. — Birkhäuser, Boston, 2002.

The theory presented has particular relevance to a number of physical applications, including heat conduction, surface and underground water flow, gas flow, and gas filtration with absorption. The work can be divided into two parts. The first part is an exposition of the methods of several general classes of nonlinear stationary equations and systems, and the second part presents applications to the theory. *Energy Methods for Free Boundary Problems* will appeal to applied mathematicians and graduate students whose research is in partial differential equations, nonlinear analysis, and continuum mechanics. Applications to a number of different problems arising in continuum mechanics (fluid dynamics) are presented making this book of equal interest to physicists and engineers as well.

André MARTINEZ. — **An introduction to semiclassical and microlocal analysis.** — Universitext. — Un vol. relié, 16×24, de viii, 190 p. — ISBN 0-387-95344-2. — Prix: € 69.95. — Springer, New York, 2002.

This book presents most of the techniques used in the microlocal treatment of semiclassical problems coming from quantum physics. Both the standard  $C^\infty$  pseudodifferential calculus and the analytic microlocal analysis are developed in a context that remains intentionally global so that only the relevant difficulties of the theory are encountered. The originality lies in the fact