

Équations différentielles ordinaires

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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.

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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^∞ 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