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## *Mesure et intégration*

Solomon LEADER. — **The Kurzweil-Henstock integral and the differentials: a unified theory of integration on  $\mathbf{R}$  and  $\mathbf{R}^n$** . — Pure and applied mathematics, vol. 242. — Un vol. relié,  $16 \times 24$ , de VIII, 355 p. — ISBN 0-8247-0535-1. — Prix: US\$150.00. — Marcel Dekker, New York, 2001.

This reference/text provides a comprehensive review of the Kurzweil-Henstock integration process on the real line and in higher dimensions – presenting a unified theory of integration that highlights Riemann-Stieltjes, and Lebesgue integrals as well as integrals of elementary calculus. Offering current versions of classical theorems in real analysis with new contributions to fundamental aspects of integral calculus, the book covers integration of summants... Riesz spaces of differentials... Archimedean properties and Hahn decomposition for differentials... the fundamental theorem of calculus... Banach's indicatrix theorem and change of variables... Green's theorem... and more.

## *Fonctions d'une variable complexe*

Theodore W. GAMELIN. — **Complex analysis**. — Un vol. broché,  $15,5 \times 23,5$ , de XVIII, 478 p. — ISBN 0-387-95069-9. — Prix: DM 69.00. — Springer, New York, 2001.

The book consists of three parts. The first part comprises the basic core of a course in complex analysis for junior and senior undergraduates. The second part includes various more specialized topics as the argument principle, the Schwarz lemma and hyperbolic geometry, the Poisson integral, and the Riemann mapping theorem. The third part consists of a selection of topics designed to complete the coverage of all background necessary for passing PhD qualifying exams in complex analysis. Topics selected include Julia sets and the Mandelbrot set, Dirichlet series and the prime number theorem, and the uniformization theorem for Riemann surfaces. The three geometries, spherical, euclidean, and hyperbolic, are stressed. Exercises range from the very simple to the quite challenging, in all chapters.

David SHOIKHET. — **Semigroups in geometrical function theory**. — Un vol. relié,  $16,5 \times 25$ , de XII, 222 p. — ISBN 0-7923-7111-9. — Prix: US\$76.00. — Kluwer Academic Publishers, Dordrecht, 2001.

This manuscript provides an introduction to the generation theory of nonlinear one-parameter semigroups on a domain of the complex plane in the spirit of the Wolff–Denjoy and Hille–Yoshida theories. Special attention is given to evolution equations reproduced by holomorphic vector fields on the unit disk. A dynamic approach to the study of geometrical properties of univalent functions is emphasized. The book will be of interest to graduate students and research specialists working in the fields of geometrical function theory, iteration theory, fixed point theory, semigroup theory, theory of composition operators and complex dynamical systems.

## *Équations différentielles ordinaires*

Lambertus A. PELETIER, William C. TROY. — **Spatial patterns: higher order models in physics and mechanics**. — Progress in nonlinear differential equations and their applications, vol. 45. — Un vol. relié,  $16 \times 24$ , de xv, 341 p. — ISBN 0-8176-4110-6. — Prix: SFr. 98.00. — Birkhäuser, Boston, 2001.

This text offers a study of nonlinear fourth order model equations that are central to description and analysis of spatio-temporal pattern formation in the natural sciences. In a unique combination of results obtained by rigorous mathematical analysis, and by computational studies, it

exhibits the principal families of solutions, such as kinks, pulses and periodic solutions, and their dependence on critical eigenvalue parameters. The text points to a rich structure, much of which still awaits to be explored. This book is meant for mathematicians who wish to become acquainted with new areas of partial and ordinary differential equations, for mathematical physicists who wish to learn about the theory developed for a class of well known higher order pattern-forming model equations, and for graduate students who are looking for an exciting and promising field of research.

### *Équations aux dérivées partielles*

Wolfgang ARENDT, Charles J.K. BATTY, Matthias HIEBER, Frank NEUBRANDER. — **Vector-valued Laplace transforms and Cauchy problems.** — Monographs in mathematics, vol. 96. — Un vol. relié, 17,5×24, de XI, 523 p. — ISBN 3-7643-6549-8. — Prix: SFr. 148.00. — Birkhäuser, Basel, 2001.

This monograph gives a systematic account of the theory of vector-valued Laplace transforms, ranging from representation theory to Tauberian theorems. In parallel, the theory of linear Cauchy problems and semigroups of operators is developed completely in the spirit of Laplace transforms. Existence and uniqueness, regularity, approximation and above all asymptotic behaviour of solutions are studied. Diverse applications to partial differential equations are given. The book contains an introduction to the Bochner integral and several appendices on background material. It is addressed to students and researchers interested in evolution equations, Laplace and Fourier transforms, and functional analysis.

Ferruccio COLOMBINI, Claude ZUILY, (Editors). — **Carleman estimates and applications to uniqueness and control theory.** — Progress in nonlinear differential equations and their applications, vol. 46. — Un vol. relié, 16,5×24, de VI, 211 p. — ISBN 0-8176-4230-7. — Prix: SFr. 178.00. — Birkhäuser, Boston, 2001.

This work consists of expository articles and research papers highlighting new results on Carleman estimates and their applications. The focus throughout is on unique continuation, control theory, and inverse problems. New results on strong uniqueness for second or higher order operators are explored in detail. Also examined are applications of Carleman estimates to stabilization, observability, and exact control for the wave and the Schrödinger equations. A final paper presents open problems on the controllability of linear and semilinear heat equations.

Ellis CUMBERBATCH, Alistair FITT, (Editors). — **Mathematical modeling: case studies from industry.** — Un vol. broché, 15×23, de XIII, 299 p. — ISBN 0-521-01173-6 (relié: 0-521-65007-0). — Prix: £23.95 (relié: £65.00). — Cambridge University Press, Cambridge, 2001.

This book deals with real industrial problems from real industries. Presented as a series of case studies by some of the world's most active and successful mathematicians working in industry, this volume shows clearly how the process of mathematical collaboration with industry can not only work successfully for the industrial partner, but also lead to interesting and important mathematics. Thirteen different problems are considered, ranging from cooking of cereal to the analysis of epidemic waves in animal populations.

Cristian E. GUTIÉRREZ. — **The Monge-Ampère equation.** — Progress in nonlinear differential equations and their applications, vol. 44. — Un vol. relié, 16×24, de XI, 126 p. — ISBN 3-7643-4177-7. — Prix: SFr. 118.00. — Birkhäuser, Boston, 2001.

The book is an essentially self-contained exposition of the theory of weak solutions, including the regularity results of L.A. Caffarelli. The presentation unfolds systematically from