Systèmes dynamiques et théorie ergodique

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condition, Campanato's nearness condition, and vanishing mean oscillation condition. They present the newest results on the basic boundary value problems for operators with VMO coefficients and non-linear operators with discontinuous coefficients and state a lot of open problems in the field.

Systèmes dynamiques et théorie ergodique

Steve ALPERN, V.S. PRASAD. — **Typical dynamics of volume preserving homeomorphisms.** — Cambridge tracts in mathematics, vol. 139. — Un vol. relié, 16×23,5, de XIX, 216 p. — ISBN 0-521-58287-3. — Prix : £30.00. — Cambridge University Press, Cambridge, 2000.

This book provides a self-contained introduction to typical properties of homeomorphisms. Examples of properties of homeomorphisms considered include transitivity, chaos and ergodicity. A key idea here is the interrelation between typical properties of volume preserving homeomorphisms and typical properties of volume preserving bijections of the underlying measure space. The authors consider volume preserving homeomorphisms of the unit n-dimensional cube, and they go on to prove fixed point theorems (Conley-Zehnder-Franks). Parts II and III consider further questions, in a leisurely fashion, for compact manifolds and sigma compact manifolds respectively.

Alan F. BEARDON. — **Iteration of rational functions: complex analytic dynamical systems.** — Graduate texts in mathematics, vol. 132. — Un vol. broché, 15,5×23,5, de XVI, 280 p. — ISBN 0-387-95151-2. — Prix : DM 89.00. — Springer, New York, 2000.

This book makes available a comprehensive, detailed, and organized treatment of the foundations of the theory of iteration of rational functions of a complex variable. The material covered extends from the original memoirs of Fatou and Julia to the recent and important results and methods of Sullivan and Shishikura. Many of the details of the proofs have not occurred in print before. The theory of dynamical systems and chaos has recently undergone a rapid growth in popularity, in part due to the spectacular computer graphics of Julia sets, fractals, and the Mandelbrot set. This text focuses on the specialized area of complex analytic dynamics, a subject that dates back to 1916 and is currently a very active area in mathematics.

Andreas JUHL. — **Cohomological theory of dynamical zeta functions.** — Progress in mathematics, vol. 194. — Un vol. relié, 17×24, de X, 709 p. — ISBN 3-7643-6405-X. — Prix : SFr. 198.00. — Birkhäuser, Basel, 2001.

The book treats various aspects of the idea to understand the analytical properties of meromorphic zeta functions on the basis of appropriate analogs of the Lefschetz fixed point formula in which the periodic orbits of the flow take the place of the fixed points. The book describes the present state of the research in a new field on the cutting edge of global analysis, harmonic analysis and dynamical systems. It should be appealing not only to the specialists on zeta functions which will find their object of favourite interest connected in new ways with index theory, geometric quantization methods, foliation theory and representation theory. There are many unsolved problems and the book hopefully promotes further progress the lines indicated here.

Stephen LYNCH. — **Dynamical systems with applications using MAPLE.** — Un vol. broché, 15,5×23,5, de XIII, 398 p. — ISBN 0-8176-4150-5. — Prix : SFr. 98.00. — Birkhäuser, Boston, 2001.

A short tutorial in MAPLE is provided at the beginning of the book to facilitate understanding of the theory and to deal with the numerous examples, diagrams, and exercises. The main

text is divided into two parts: continuous systems using differential equations and discrete dynamical systems. Differential equations are used to model examples taken from various topics such as mechanical systems, interacting species, electronic circuits, chemical reactions, and meteorology. The section on continuous systems ends with a study of limit cycles and the second part of Hilbert's 16th problem. Part II deals with both real and complex dynamical systems.

Alistair I. MEES, (Editor). — **Nonlinear dynamics and statistics.** — Un vol. relié, 16×24, de XXII, 473 p. — ISBN 0-8176-4163-7. — Prix: SFr. 168.00. — Birkhäuser, Boston, 2001.

This book brings together different approaches to nonlinear time series analysis in order to begin a synthesis that will lead to better theory and practice in all the related areas. This book describes the state of the art in nonlinear dynamical reconstruction theory. The chapters are based upon a workshop held at the Isaac Newton Institute, Cambridge University, UK, in late 1998. The book's chapters present theory and methods topics by leading researchers in applied and theoretical nonlinear dynamics, statistics, probability, and systems theory. Professionals, researchers, and advanced graduates in nonlinear dynamics, probability, optimization, and systems theory will find the book a useful resource and guide to current developments in the subject.

Anthony N. MICHEL, Kaining WANG, Bo HU. — **Qualitative theory of dynamical systems: the role of stability preserving mappings.** — Second edition, revised and expanded. — Pure and applied mathematics, vol. 239. — Un vol. relié, 15,5×23,5, de XV, 707 p. — ISBN 0-8247-0526-2. — Prix: US$ 195.00. — Marcel Dekker, New York, 2001.

This reference/text illuminates the most important results of the Lyapunov and Lagrange stability theory for a general class of dynamical systems by developing topics in a metric space independently of equations, inequalities, or inclusions; applies the general theory to specific classes of equations; and presents new and expanded data on the stability analysis of hybrid dynamical systems and dynamical systems with discontinuous dynamics. The second edition includes detailed case studies of single- and multirate digital feedback control systems... pulse width-modulated feedback control systems... variable structure systems with applications to recurrent artificial neural networks... linear systems under state saturation constraints... switched systems... systems with impulsive dynamics... and more.

Equations aux différences finies, équations fonctionnelles

David L. JAGERMAN. — **Difference equations with applications to queues.** — Pure and applied mathematics, vol. 233. — Un vol. relié, 16×23,5, de XI, 246 p. — ISBN 0-8247-0388-X. — Prix: US$ 135.00. — Marcel Dekker, New York, 2000.

This monograph presents a theory of difference and functional equations with continuous argument based on a generalization of the Riemann integral introduced by N. E. Nörlund, allowing differentiation with respect to the independent variable and permitting greater flexibility in constructing solutions and approximations, solving the nonlinear first order equation by a variety of methods, including an adaptation of the Lie-Gröbner theory. *Difference Equations with Applications to Queues* shows that the homogeneous sum admits exponential eigenfunctions with explicitly defined eigenvalues; illustrates the value of representations for practical computations; studies the linear difference equation with polynomial coefficients; obtains a singular perturbation solution for the processor-sharing queue; extends the Euler–Maclaurin representation for the Nörlund sum to the complex plane; gives a theory of the differential–difference equation pioneered by C. Truesdell; ... and more!