présente la théorie intrinsèque des variétés (avec comme objectif essentiel la compréhension des notions de fibré tangent et fibré normal) et enchaîne sur les premiers rudiments de la topologie algébrique (homotopie et revêtements). Elle se termine par une ébauche de théorie de l'intégration sur les variétés, où l'on fait connaissance avec l'homologie et la cohomologie.

Andrew RANICKI. — **High dimensional knot theory: algebraic surgery in codimension 2.** — With an appendix by Elmar WINKELNKEMPER. — Springer monographs in mathematics. — Un vol. relié, 16×24, de XXXVI, 646 p. — ISBN 3-540-63389-8. — Prix: DM 189.00. — Springer, Berlin, 1998.

This is the first book entirely devoted to high-dimensional knots. The main theme is the application of the author's algebraic theory of surgery to provide a unified treatment of the invariants of codimension 2 embeddings, generalizing the Alexander polynomials and Seifert forms of classical knot theory. Many results in the research literature are thus brought into a single framework, and new results are obtained. The treatment is particularly effective in dealing with open books, which are manifolds with codimension 2 submanifolds such that the complement fibres over a circle.

Robert ROUSSARIE. — **Bifurcations of planar vector fields and Hilbert's sixteenth problem.** — Progress in mathematics, vol. 164. — Un vol. relié, 16×24, de XVII, 204 p. — ISBN 3-7643-5900-5. — Prix: SFr. 98.00. — Birkhäuser Verlag, Basel, 1998.

In a coherent, exhaustive and progressive way, this book presents the tools for studying local bifurcations of limit cycles in families of planar vector fields. A systematic introduction is given to such methods as division of an analytic family of functions in its ideal coefficients, and asymptotic expansion of non-differentiable return maps and desingularisation. The exposition moves from classical analytic geometric methods applied to regular limit periodic sets to more recent tools for singular limit sets. The methods can be applied to theoretical problems such as Hilbert's 16th problem, but also for the purpose of establishing bifurcation diagrams of specific families as well as explicit computations.

David SPRING. — **Convex integration theory: solutions to the h-principle in geometry and topology.** — Monographs in mathematics, vol. 92. — Un vol. relié, 17×24, de VIII, 212 p. — ISBN 3-7643-5805-X. — Prix: SFr. 128.00. — Birkhäuser Verlag, Basel, 1998.

This book provides a comprehensive study of convex integration theory in immersion-theoretic topology. This book is the first to present an exacting record and exposition of all of the basic concepts and technical results of convex integration theory in higher order jet spaces, including the theory of iterated convex hull extensions and the theory of relative h-principles. A second feature of the book is its detailed presentation of applications of the general theory to topics in symplectic topology, divergence free vector fields on 3-manifolds, isometric immersions, totally real embeddings, underdetermined non-linear systems of PDEs, the relaxation theorem in optimal control theory, as well as applications to the traditional immersion-£ theoretical topics such as immersions, submersions, k-mersions and free maps.

Probabilités et processus stochastiques

Richard F. BASS. — **Diffusions and elliptic operators.** — Probability and its applications. — Un vol. relié, 15,5×24, de XIII, 232 p. — ISBN 0-387-98315-5. — Prix: DM 118.00. — Springer, New York, 1998.

This book discusses the interplay of diffusion processes and partial differential equations (PDEs) with an emphasis on probabilistic methods in PDEs. It begins with stochastic

differential equations, the probabilistic machinery needed to study PDEs. After spending three chapters on probabilistic representations of solutions for PDEs, regularity of solutions, and one-dimensional diffusions, the author discusses in depth two main types of second-order linear differential operators: nondivergence operators and divergence operators, including such topics as the Harnack inequality of Krylov-Safonov for nondivergence operators and heat kernel estimates for divergence form operators. Martingales problems and the Malliavin calculus are presented in two other chapters.

Jean BERTOIN. — **Lévy processes.** — Cambridge tracts in mathematics, vol. 121. — Un vol. broché, 15,5×23, de x, 266 p. — ISBN 0-521-64632-4. — Prix: £37.50. — Cambridge University Press, Cambridge, 1998.

This is an up-to-date and comprehensive account of the theory of Lévy processes. This branch of modern probability theory has been developed over recent years and has many applications in such areas as queues, mathematical finance and risk estimation. Professor Bertoin has used the powerful interplay between the probabilistic structure and analytic tools to give a quick and concise treatment of the core theory, with the minimum of technical requirements. Special properties of subordinators are developed and then appear as key features in the study of the local times of real-valued Lévy processes and in fluctuation theory. Lévy processes with no positive jumps receive special attention, as do stable processes.

Amir DEMBO, Ofer ZEITOUNI. — **Large deviations techniques and applications.** — Second edition. — Applications of mathematics. — Un vol. relié, 16×24, de xvi, 396 p. — ISBN 0-387-98406-2. — Prix: DM 124.00. — Springer, New York, 1998.

In view of the diversity of its applications, there is a wide range in the backgrounds of those who are to apply the theory of large deviations. This book provides an exposition geared towards such different audiences. While the format and numbering sequence of the first edition have been kept, new material has been added concerning concentration inequalities and the metric and weak convergence approaches to large deviations. In addition to being useful to many applications this material helps in placing large deviations theory within the general framework of probability theory. Reflecting other recent developments in the area of large deviations, general statements and applications have been sharpened, new exercises added, and the bibliography updated.

Ernst EBERLEIN, Marjorie HAHN, Michel TALAGRAND, (Editors). — **High dimensional probability.** — Progress in probability, vol. 43. — Un vol. relié, 16,5×24, de viii, 330 p. — ISBN 3-7643-5867-X. — Prix: SFr. 128.00. — Birkhäuser Verlag, Basel, 1998.

What is high dimensional probability? Under this broad term one finds a collection of topics associated by the fact that is expressed in the problem or in the methods by which it is approached. For example, the study of probability in Banach spaces gave impetus to a number of methods whose importance has gone far beyond the original goal of extending limit laws to the vector valued case. Many of the new ideas, results and directions of this newly evolving field were explored on a broad front at the Conference on High Dimensional Probability held at Oberwolfach in August 1996.

Vladimir FOMIN. — **Optimal filtering, vol. 1: Filtering of stochastic processes.** — Mathematics and its applications, vol. 457. — Un vol. relié, 16,5×25, de ix, 375 p. — ISBN 0-7923-5286-6. — Prix: Dfl. 320.00. — Kluwer Academic Publisher, Dordrecht, 1999.

This book considers methods of optimal signal processing. The generalized filtering theory presented includes both highly developed, now classical branches like Wiener-Kolmogorov and

Kalman-Bucy theories, as well as relatively new branches such as semidegenerate processes and minimax filtering. The unique two-level approach to filtering problems is applied depending on their complexity. Starting with conventional notions of filtering theory, in terms of difference-differential models, the research proceeds to notions and constructions of functional analysis convenient for analysing linear filtering problems. Many novel results on filtering theory are also introduced.

Laurent MAZLIAK, Pierre PRIOURET, Paolo BALDI. — **Martingales et chaînes de Markov.** — Collection Méthodes. — Un vol. broché, 15×22, de VIII, 215 p. — ISBN 2-7056-6382-7. — Prix: FF 180.00. — Hermann, Paris, 1998.

Cet ouvrage a pour origine le cours de processus aléatoires de la maîtrise de mathématiques de l'Université Pierre-et-Marie-Curie (Paris VI). Il contient de nombreux exercices et problèmes sur les martingales et les chaînes de Markov à temps discret, corrigés de manière détaillée. Chaque chapitre est précédé de substantiels rappels de cours incluant la plupart du temps des démonstrations. Les problèmes apportent des compléments permettant au lecteur d'approfondir ses connaissances en abordant des résultats plus avancés de la théorie. Cet ouvrage est principalement destiné aux étudiants de deuxième cycle et aux candidats à l'agrégation.

Michel WEBER. — **Entropie métrique et convergence presque partout.** — Travaux en cours, vol. 58. — Un vol. broché, 17×24, de 150 p. — ISBN 2-7056-6381-9- — Prix: FF 180.00. — Hermann, Paris, 1998.

L'interaction fructueuse entre la théorie des probabilités et la théorie ergodique, amorcée par Stein et surtout, plus récemment, par Bourgain et Talagrand, exploite efficacement des méthodes d'entropie métrique appartenant à la théorie des processus stochastiques. L'auteur apporte une présentation, un commentaire et des démonstrations détaillées des critères d'entropie métrique de Bourgain ainsi que des siens propres, d'un point de vue probabiliste. Les outils gaussiens mis en œuvre, ainsi que les propriétés fondamentales des processus gaussiens, sont présentés de façon claire et accessible pour le lecteur ergodicien non spécialiste des processus gaussiens.

G. George YIN, Qing ZHANG. — **Continuous-time Markov chains and applications: a singular perturbation approach.** — Applications of mathematics, vol. 37. — Un vol. relié, 16,5×24,5, de XV, 349 p. — ISBN 0-387-98244-2. — Prix: DM 118.00. — Springer, New York, 1998.

This book discusses continuous-time Markov chains and applications. Using a singular perturbation approach, it presents a systematic treatment of singularly perturbed systems that naturally arise in queueing theory, control and optimization, and manufacturing systems. It gathers a number of ideas in Markov chains and singular perturbations that are scattered throughout the literature. It presents results on asymptotic expansions of the corresponding probability distributions, functional occupation measures, exponential upper bounds, and asymptotic normality. The emphasis is on Markov chains with weak and strong interactions and structural properties.

Statistique

A.A. BOROVKOV. — **Mathematical statistics.** — Transl. from the Russian by A. Moullagaliev. — Un vol. relié, 19×26, de XXI, 570 p. — ISBN 90-5699-018-7. — Prix: £89.00. — Gordon and Breach Science Publishers, Amsterdam, 1998.

The author presents classical results and methods which form the basis of modern statistics, and examines the foundations of estimation theory, hypothesis testing theory, and statistical