

Topologie des variétés, analyse globale et analyse des variétés

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surfaces. – Surfaces as plane diagrams. – Distinguishing surfaces. – Patterns on surfaces. – Maps and graphs. – Vector fields on surfaces. – Plane tessellation representations of compact surfaces. – Some applications of tessellation representations. – Introducing the fundamental group. – Surfaces with boundaries, with an application to knots. – Graphs and groups, problem exercises, tutorial solutions.

Stephen HUGGETT, David JORDAN. — **A topological aperitif.** — Un vol. broché, 17×24 , de VIII, 166 p. — ISBN 1-85233-377-4. — Prix: DM 49.90. — Springer, London, 2001.

This is a book of elementary geometric topology, in which geometry, frequently illustrated, guides calculation. The book starts with a wealth of examples, often subtle, of how to be mathematically certain whether two objects are the same from the point of view of topology. After introducing surfaces, such as the Klein bottle, the book explores the properties of polyhedra drawn on these surfaces. Even in the simplest case, of spherical polyhedra, there are good questions to be asked. More refined tools are developed in a chapter on winding number, and an appendix gives a glimpse of knot theory.

Topologie algébrique

Jaumé AGUADÉ, Carles BROTO, Carles CASACUBERTA, (Editors) — **Cohomological methods in homotopy theory.** — Barcelona Conference on Algebraic Topology, Bellaterra, Spain, June 4-10, 1998. — Progress in mathematics, vol. 196. — Un vol. relié, 16×24 , de 415 p. — ISBN 3-7643-6588-9. — Prix: SFr. 148.00. — Birkhäuser, Basel, 2001.

This book contains a collection of articles summarizing the state of knowledge in a large portion of modern homotopy theory. A call for articles was made on the occasion of an emphasis semester organized by the Centre de Recerca Matemàtica in Bellaterra (Barcelona) in 1998. The main topics treated in the book include abstract features of stable and unstable homotopy, homotopical localizations, p -compact groups, H -spaces, classifying spaces for proper actions, cohomology of discrete groups, K -theory and other generalized cohomology theories, configuration spaces, and Lusternik-Schnirelmann category.

Topologie des variétés, analyse globale et analyse des variétés

Isaac CHAVEL. — **Isoperimetric inequalities: differential geometric and analytic perspectives.** — Cambridge tracts in mathematics, vol. 145. — Un vol. relié, 16×23 , de XII, 268 p. — ISBN 0-521-80267-9. — Prix: £50.00. — Cambridge University Press, Cambridge, 2001.

This introduction treats the classical isoperimetric inequality in Euclidean space and contrasting rough inequalities in noncompact Riemannian manifolds. The treatment in Euclidean space features a number of proofs of the classical inequality in increasing generality, providing in the process a transition from the methods of classical differential geometry to those of modern geometric measure theory; and the treatment in Riemannian manifolds features discretization techniques and applications to upper bounds of large time heat diffusion in Riemannian manifolds. The result is an introduction to the rich tapestry of ideas in geometry and analysis, a subject that continues to inspire fresh ideas in geometry and analysis to this very day – and beyond.

David N. YETTER. — **Functorial knot theory: categories of tangles, coherence, categorical deformations, and topological invariants.** — Series on knots and everything, vol. 26. — Un vol. relié, 16×23 , de 230 p. — ISBN 981-02-4443-6. — Prix: £40.00. — World Scientific, Singapore, 2001.

This book begins with a detailed exposition of the key ideas in the discovery of monoidal categories of tangles as central objects of study in low-dimensional topology. The focus then

turns to the deformation theory of monoidal categories and the related deformation theory of monoidal functors, which is a proper generalization of Gerstenhaber's deformation theory of associative algebras. These serve as the building blocks for a deformation theory of braided monoidal categories which gives rise to sequences of Vassiliev invariants of framed links, and clarify their interrelations.

Probabilités et processus stochastiques

O.E. BARNDORFF-NIELSEN, T. MIKOSCH, S.I. RESNICK, (Editors). — **Lévy processes: theory and applications.** — Un vol. relié, 19×26, de x, 415 p. — ISBN 0-8176-4167-X. — Prix: SFr. 148.00. — Birkhäuser, Boston, 2001.

A Lévy process is a continuous-time analogue of a random walk, and as such, is at the cradle of modern theories of stochastic processes. Martingales, Markov processes, and diffusions are extensions and generalizations of these processes. In the past, representatives of the Lévy class were considered most useful for applications to either Brownian motion or the Poisson process. Nowadays the need for modeling jumps, bursts, extremes and other irregular behavior of phenomena in nature and society has led to a renaissance of the theory of general Lévy processes. Researchers and practitioners in fields as diverse as physics, meteorology, statistics, insurance, and finance have rediscovered the simplicity of Lévy processes and their enormous flexibility in modeling tails, dependence and path behavior. This volume describes the state-of-the-art of this rapidly evolving subject with special emphasis on the non-Brownian world. Leading experts present surveys of recent developments, or focus on some most promising applications.

Tim BEDFORD, Roger COOKE. — **Probabilistic risk analysis: foundations and methods.** — Un vol. relié, 18×25, de xx, 393 p. — ISBN 0-521-7730-2. — Prix: £37.50. — Cambridge University Press, Cambridge, 2001.

Drawing on extensive experience in the theory and applications of risk analysis, the authors focus on the conceptual and mathematical foundations underlying the quantification, interpretation and management of risk. They cover standard topics as well as important new subjects such as the use of expert judgement and uncertainty propagation. The relationship of risk analysis to decision making is highlighted in chapters on influence diagrams and decision theory. Finally, the difficulties of choosing metrics to quantify risk, and current regulatory frameworks are discussed.

A.B.CRUZEIRO, J.-C. ZAMBRINI, (Editors). — **Stochastic analysis and mathematical physics.** — Progress in probability, vol. 50. — Un vol. relié, 16×24, de 158 p. — ISBN 0-8176-4246-3. — Prix: SFr. 158.00. — Birkhäuser, Boston, 2001.

Nine survey articles in this volume extend concepts from classical probability and stochastic processes to a number of areas of mathematical physics. Key topics covered: nonlinear stochastic wave equations, completely positive maps, Mehler-type semigroups on Hilbert spaces, entropic projections, martingale problem and Markov uniqueness of infinite-dimensional Nelson diffusions, analysis in geometric probability theory, measure-preserving shifts on the Wiener space, cohomology on loop spaces, and stochastic Volterra equations.

Peter IMKELLER, Jin-Song VON STORCH, (Editors). — **Stochastic climate models.** — Progress in probability, vol. 49. — Un vol. relié, 16,5×24, de xxvii, 398 p. — ISBN 3-7643-6520-X. — Prix: SFr. 148.00. — Birkhäuser, Basel, 2001.

This book presents a collection of articles based on a selection of lectures given at the interdisciplinary Workshop on Stochastic Climate Models held in Chorin, Germany, from May 31 to