

Géométrie

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Calcul des variations

George Xian-Zhi YUAN. — **KKM theory and applications in nonlinear analysis.** — Pure and applied mathematics, vol. 218. — Un vol. relié, 16×23,5, de xii, 621 p. — ISBN 0-8247-0031-7. — Prix: US\$ 195.00. — Marcel Dekker, New York, 1999.

This reference provides an introduction to the principles and applications of Knaster-Kuratowski-Mazurkiewicz (KKM) theory and explores related topics in nonlinear set-valued analysis. The book highlights the generic method for analyzing stability and uniqueness... develops a general topological fixed point theory for set-valued analysis... generalizes abstract convex structures... details a general topological minimax theory... investigates the structure of set-valued mappings... studies the existence, algorithms, and solutions for variational and quasivariational inequalities... gives applications of Browder-Fan and Fan-Glicksberg fixed-point theorems..., etc.

Géométrie

David A. BRANNAN, Matthew F. ESPLIN, Jeremy J. GRAY. — **Geometry.** — Un vol. broché, 19×24,5, de xi, 497 p. — ISBN 0-521-59787-0. — Prix: £18.95. — Cambridge University Press, Cambridge, 1999.

This is a textbook that demonstrates the excitement and beauty of geometry. The approach is that of Klein in his Erlangen programme: a geometry is a space together with a set of transformations of that space. The authors explore various geometries: affine, projective, inversive, non-Euclidean and spherical. In each case the key results are explained carefully, and the relationships between the geometries are discussed. This richly illustrated and clearly written text includes full solutions to over 200 problems.

Gerald E. FARIN. — **NURBS: from projective geometry to practical use.** — Second edition. — Un vol. relié, 15,5×23,5, de xv, 267 p. — ISBN 1-56881-084-9. — Prix: US\$44.00. — A.K. Peters, Natick, Massachusetts, 1999.

NURBS (Non-Uniform Rational B-Splines) have become the de facto standard for geometric definition in CAD/CAM and computer graphics. This well-known book covers NURBS from their geometric beginnings to their industrial applications. The second edition incorporates new research results and a chapter on Pythagorean curves, a development that shows promise in applications such as NC machining or robot motion control.

Peter W. HALLINAN, Gaile G. GORDON, A.L. YUILLE, Peter GIBLIN, David MUMFORD. — **Two- and three- dimensional patterns of the face.** — Un vol. relié, 16×24, de viii, 262 p. — ISBN 1-56881-087-3. — Prix: US\$48.00. — A.K. Peters, Natick, Massachusetts, 1999.

The human face is perhaps the most familiar and easily recognized object in the world, yet both its three-dimensional shape and its two-dimensional images are complex and hard to characterize. This book ties together applied mathematics, applied statistics, and engineering by applying general theories and concepts to the specific and familiar example of the human face. The authors include fully worked out examples of two approaches to face recognition, demonstrating the power of pattern theory and suggesting interesting new mathematics in the two- and three-dimensional aspects of the face.

Heinz LÜNEBURG. — **Die euklidische Ebene und ihre Verwandten.** — Un vol. broché, 17×24, de viii, 207 p. — ISBN 3-7643-5685-5. — Prix: SFr. 44.00. — Birkhäuser, Basel, 1999.

Unter Verzicht auf alles Räumliche wird hier die ebene euklidische Geometrie aufgebaut, indem mit der Untersuchung von beliebigen projektiven und affinen Ebenen begonnen, dann

aber sehr rasch zu Ebenen übergegangen wird, die von kommutativen Körpern koordinatisiert werden. In affinen Ebenen werden die Mittelpunktsrelation studiert, die erstaunliche Konsequenzen hat, sowie Orthogonalitätsrelationen und das Winkelhalbieren. Ist das Winkelhalbieren immer möglich, trägt der Koordinatenkörper eine Anordnung, so dass man schon sehr nahe bei der euklidischen Ebene ist. Zum Schluss, im siebten Kapitel, wird dann gezeigt, welche geometrischen Eigenschaften dazu dienen können, die reelle Ebene unter allen übrigen affinen Ebenen auszuzeichnen.

Ensembles convexes et inégalités géométriques

Keith M. BALL, Vitali MILMAN, (Editors). — **Convex geometric analysis**. — Mathematical Sciences Research Institute publications, vol. 34. — Un vol. relié, 16×24, de xx, 236 p. — ISBN 0-521-64259-0. — Prix: £ 30.00. — Cambridge University Press, Cambridge, 1999.

This collection of research and expository articles on convex geometry and probability reflects the work done at the program in convex geometry and geometric analysis that took place at MSRI in 1996, emphasizing the links between the geometry of convex bodies, probability theory, harmonic analysis, and recent probabilistic methods in computation. It includes contributions from C. Borell, J. Bourgain, E.D. Gluskin, W.T. Gowers, G. Kalai, G. Kuperberg, B. Maurey, V. Milman, A. Pajor, G. Schechtman, M. Schmuckenschlager, C. Schütt, G. Zang, and several of the most promising representatives of the new generation.

Chuanming ZONG. — **Sphere packings**. — Universitext. — Un vol. relié, 16,5×24,5, de xiii, 241 p. — ISBN 0-387-98794-0. — Prix: DM 79.00. — Springer, New York, 1999.

Sphere packings is one of the most fascinating and challenging subjects in mathematics. In addition to the classical sphere packing problems, this book also deals with the contemporary ones; such as, blocking light rays, the holes in sphere packings, and finite sphere packings. Not only are the main results of the subject presented, but also its creative methods from areas such as geometry, number theory, and linear programming are described. The book also contains short biographies of several masters of this discipline and many open problems.

Géométrie différentielle

Tobias H. COLDING, William P. MINICOZZI II. — **Minimal surfaces**. — Courant lecture notes, vol. 4. — Un vol. broché, 15,5×22,5, de viii, 124 p. — ISBN 0-9658703-3-2. — Prix: US\$20.00. — Courant Institute of Mathematical Sciences, New York, 1999.

These notes are an expanded version of a one-semester course taught at Courant in 1998. Chapter 1 will first derive the minimal surface equation as the Euler-Lagrange equation for the area functional on graphs. The focus of this chapter is on the basic properties of minimal surfaces, including the monotonicity formula for area and the Bernstein theorem. Chapter 2 deals with generalizations of the Bernstein theorem discussed in Chapter 1. Chapter 3 starts by introducing stationary varifolds as a generalization of classical minimal surfaces. A proof of a generalization of the Bernstein problem is given. Chapter 4 discusses the solution to the classical Plateau problem, focusing primarily on its regularity. Finally, in Chapter 5, the authors discuss the theory of minimal surfaces in three-manifolds.

Theodore FRANKEL. — **The geometry of physics: an introduction**. — Un vol. broché, 18×25, de xxii, 654 p. — ISBN 0-521-38753-1. — Prix: £22.95. — Cambridge University Press, Cambridge, 1998.

This book is intended to provide knowledge of those parts of exterior differential forms, differential geometry, algebraic and differential topology, Lie groups, vector bundles and Chern