Zeitschrift: L'Enseignement Mathématique
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Kapitel: Géométrie différentielle

à la géométrie hyperbolique en dimension deux. Chacun de ces textes est autonome, et peut aussi bien servir à préparer l'écrit du concours qu'à enrichir bon nombre de leçons d'oral en algèbre-géométrie et en analyse.

James W. ANDERSON. — **Hyperbolic geometry.** — Springer undergraduate mathematics series. — Un vol. broché, 17×23,5, de IX, 230 p. — ISBN 1-85233-156-9. — Prix: DM 59.00. — Springer, London, 1999.

This book provides a self-contained introduction to the subject, taking the approach that hyperbolic geometry consists of the study of those quantities invariant under the action of a natural group of transformations. Topics covered include the upper half-space model of the hyperbolic plane, Möbius transformations, the general Möbius group and the subgroup preserving path length in the upper half-space model, arc-length and distance, the Poincaré disc model, convex subsets of the hyperbolic plane, the Gauss-Bonnet formula for the area of a hyperbolic polygon and its applications.

J.-R. SACK, J. URRUTIA, (Editors). — **Handbook of computational geometry.** — Un vol. relié, 17×25, de X, 1027, 43 p. — ISBN 0-444-82537-1. — Prix: Dfl. 375.00. — Elsevier, Amsterdam, 2000.

This handbook will be an important source of information for all of us interested in one way or another in computational geometry. The book presents chapters which survey in detail most of the research available to date in this field. It contains survey papers in the following fundamental topics: arrangements, Voronoi diagrams, geometric data structures (incl. point location, convex hulls, etc.), spatial data structures, polygon decomposition, randomized algorithms, derandomization, parallel computational geometry (deterministic and randomized) visibility, art gallery and illumination problems, closest point problems, link distance problems, similarity and geometric objects, Davenport-Schinzel sequences, and spanning trees and spanners. There are also three chapters devoted to applications of computer geometry to other fields of science: geographical information systems, geometric shortest paths and network optimization, and mesh generation. In addition, there is a chapter devoted to robustness and numerical issues, and chapters on animation and graph drawing.

Géométrie différentielle

S.S. CHERN, W.H. CHEN, K.S. LAM. — **Lectures on differential geometry.** — Series on university mathematics, vol. 1. — Un vol. broché, 15,5×21,5, de X, 356 p. — ISBN 981-02-4182-8. — Prix: £19.00. — World Scientific, Singapore, 1999.

The present book is a translation and an expansion of an introductory text based on a lecture series delivered in Peking University in 1980. This translation aims at preserving, as far as possible, both the contents and style of Professor Chern's lectures. *Contents:* Differentiable manifolds. — Multilinear algebra. — Exterior differential calculus. — Connections. — Riemannian geometry. — Lie groups and moving frames. — Complex manifolds. — Finsler geometry. — Historical notes. — Differential geometry and theoretical physics.

Franki J.E. DILLEN, Leopold C.A. VERSTRAELEN, (Editors). — **Handbook of differential geometry, vol. 1.** — Un vol. relié, 17,5×24,5, de XI, 1054 p. — ISBN 0-444-82240-2. — Prix: Dfl. 350.00. — North-Holland, Amsterdam, 2000.

All chapters of the Handbook are written by experts in the area and contain a large bibliography The authors have freedom on the length, style and depth of their contributions. In

succeeding volumes, chapters concerning significant areas of differential geometry will be published as they are completed and sent in by their authors. — *Contents:* M.A. Akivis and V.V. Goldberg: Differential geometry of webs. — D.E. Blair: Spaces of metrics and curvature functionals. — B.-Y. Chen: Riemannian submanifolds. — A. Derdzinski: Einstein metrics in dimension four. — P.B. Gilkey: The Atiyah-Singer index theorem. — C.S. Gordon: Survey of isospectral manifolds. — Ü. Lumiste: Submanifolds with parallel fundamental form. — K. Shiohama: Sphere theorems. — U. Simon: Affine differential geometry. — G. Thorbergsson: A survey on isoparametric hypersurfaces and their generalizations. — T. Willmore: Curves.

Misha GROMOV. — **Metric structures for Riemannian and non-Riemannian spaces.** — Based on *Structures métriques des variétés riemanniennes.* — With appendices by M. Katz, P. Pansu, and S. Semmes. — Edited by J. LaFontaine and P. Pansu. — English translation by Sean Michael Bates. — Progress in mathematics, vol. 152. — Un vol. relié, 16,5×24, de XIX, 585 p. — ISBN 0-8176-3998-9. — Prix: SFr. 168.00. — Birkhäuser, Boston, 1999.

The boundary of metric theory, which covers a domain between the fields of topology and global Riemannian geometry, has dramatically exploded in the last 20 years, in part due to the important research of one of the world's leading geometers, M. Gromov. This book is based on an earlier French work (1979) which has been substantially revised and expanded. Exciting new connections between geometry and probability theory are made and links to analysis are developed. Key ideas of real analysis are presented in an accessible way to geometers. This self-contained monograph may be used in seminars and topics courses. Numerous illustrations and examples, bibliography and index, accompany a well-written text, which is an excellent self-study resource for geometers, analysts, and probabilists.

Topologie algébrique

Paul G. GOERSS, John F. JARDINE. — **Simplicial homotopy theory.** — Progress in mathematics, vol. 174. — Un vol. relié, 16,5×23,5, de XV, 510 p. — ISBN 3-7643-6064-X. — Prix: SFr. 98.00. — Birkhäuser, Basel, 1999.

With the development of Quillen's concept of a closed model category and in particular, a simplicial model category, the collection of simplicial methods has become the primary way to describe non-abelian homological algebra and to address homotopy-theoretical issues in a variety of fields, including algebraic K-theory. This book supplies a modern exposition of these ideas, emphasizing model category theoretical techniques. Discussed here are the homotopy theory of simplicial sets, and other basic topics such as simplicial groups, Postnikov towers, and bisimplicial sets. The more advanced material includes homotopy limits and colimits, localization with respect to a map and with respect to a homology theory, cosimplicial spaces, and homotopy coherence. Interspersed throughout are many results and ideas well-known to experts, but uncollected in the literature.

Sibe MARDEŠIĆ. — **Strong shape and homology.** — Springer monographs in mathematics. — Un vol. relié, 17×24, de XII, 489 p. — ISBN 3-540-66198-0. — Prix: DM 159.00. — Springer, Berlin, 2000.

Shape theory is an extension of homotopy theory from the realm of CW-complexes to arbitrary spaces. Besides applications in topology, it has interesting applications in various other areas of mathematics, especially in dynamical systems and C*-algebras. Strong shape is a refinement of ordinary shape with distinct advantages over the latter. Strong homology generalizes Steenrod homology and is an invariant of strong shape. The book gives a detailed account