Topologie des variétés, analyse globale et analyse des variétés

Topologie algébrique

Lech GÓRNIEWICZ. — **Topological fixed point theory of multivalued mappings.** — Mathematics and its applications, vol. 495. — Un vol. relié, 16×25, de IX, 399 p. — ISBN 0-7923-6001-X. — Prix: Dfl. 330.00. — Kluwer Academic Publishers; Dordrecht, 1999.

This volume presents a broad introduction to the topological fixed point theory of multivalued (set-valued) mappings, treating both classical concepts as well as modern techniques. Topics covered include the basic theory of set-valued mappings with both convex and nonconvex values, approximation and homological methods in the fixed point theory together with a thorough discussion of various index theories for mappings with a topologically complex structure of values, applications to many fields of mathematics, mathematical economics and related subjects, the fixed point approach to the theory of ordinary differential inclusions.

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Boris N. APANASOV. — **Conformal geometry of discrete groups and manifolds.** — De Gruyter expositions in mathematics, vol. 32. — Un vol. relié, 17,5×24,5, de XIII, 523 p. — ISBN 3-11-014404-2. — Prix: DM 298.00. — Walter de Gruyter, Berlin, 2000.

This book presents the first systematic account of conformal geometry of n-manifolds, as well as its Riemannian counterparts. A unifying theme is their discrete holonomy groups. In particular, hyperbolic manifolds, in dimension 3 and higher, are addressed. The treatment covers also relevant topology, algebra (including combinatorial group theory and varieties of group representations), arithmetic issues, and dynamics. Progress in these areas has been very fast over the last two decades, especially due to the Thurston geometrization program, leading to the solution of many difficult problems. A strong effort has been made to point out new connections and perspectives in the field and to illustrate various aspects of the theory. An intuitive approach which emphasizes the ideas behind the constructions is complemented by a large number of examples and figures which both use and support the reader's geometric imagination. The text will be of value to graduate students and researchers in topology, geometry, group representations and theoretical physics.

Eduardo CASAS-ALVERO. — **Singularities of plane curves.** — London Mathematical Society lecture note series, vol. 276. — Un vol. broché, 15×23, de XV, 345 p. — ISBN 0-521-78959-1. — Prix: £29.95. — Cambridge University Press, Cambridge, 2000.

This book provides a comprehensive and self-contained exposition of the algebro-geometric theory of singularities of plane curves, covering both its classical and its modern aspects. The book gives a unified treatment, with complete proofs, presenting modern results which have only ever appeared in research papers. It updates and correctly proves a number of important classical results for which there was formerly no suitable reference, and includes new, previously unpublished results as well as applications to algebra and algebraic geometry.

Erica FLAPAN. — **When topology meets chemistry: a topological look at molecular chirality.** — Outlooks. — Un vol. broché, 15×22,5, de XIII, 241 p. — ISBN 0-521-66482-9 (relié: 0-521-66254-0). — Prix: £16.95 (relié: £45.00). — Mathematical Association of America and Cambridge University Press, Cambridge, 2000.

The applications of topological techniques for understanding molecular structures have become increasingly important over the past thirty years. In this topology text, the reader will learn about knot theory, 3-dimensional manifolds, and the topology of embedded graphs, while

learning the role these play in understanding molecular structures. Most of the results that are described in the text are motivated by questions asked by chemists or molecular biologists, though the results themselves often go beyond answering the original question asked. There is no specific mathematical or chemical prerequisite; all the relevant background is provided. The text is enhanced by nearly 200 illustrations and more than 100 exercises. Reading this fascinating book, undergraduate mathematics students can escape the world of pure abstract theory and enter that of real molecules, while chemists and biologists will find simple, clear but rigorous definitions of mathematical concepts they handle intuitively in their work.

Peter B. GILKEY, John V. LEAHY, Jeonghyeong PARK. — **Spectral geometry, Riemannian submersions and the Gromov-Lawson conjecture.** — Studies in advanced mathematics. — Un vol. broché, 16×34, de 279 p. — ISBN 0-8493-8277-7. — Prix: £53.00. — Chapman & Hall, Boca Raton, 1999.

This text explores the spectral geometry of Riemannian submersions. After providing the necessary background, including discussion of elliptic operators and basic differential geometry, the authors address questions of positive curvature and discuss recent developments in this area. They establish – for the first time in mathematical literature – a link between the spectral geometry of Riemannian submersions and the Gromov-Lawson conjecture. *Features:* provides a background review of differential geometry and elliptic operators; creates a link between the spectral geometry of Riemannian submersions and the Gromov-Lawson conjecture; includes a extensive bibliography; offers surprising results and sets forth unsolved problems.

John M. LEE. — **Introduction to topological manifolds.** — Graduate texts in mathematics, vol. 202. — Un vol. broché, 23,5×15,5, de XVII, 385 p. — ISBN 0-387-95026-5. — Prix: DM 69.00. — Springer, New York, 2000.

This book is an introduction to manifolds at the beginning graduate level. It contains the essential topological ideas that are needed for the further study of manifolds, particularly in the context of differential geometry, algebraic topology, and related fields. Its guiding philosophy is to develop these ideas rigorously but economically, with minimal prerequisites and plenty of geometric intuition. A course on manifolds differs from most other introductory mathematics graduate courses in that the subject matter is often completely unfamiliar. It is even possible to get through an entire undergraduate mathematics education without hearing the word "manifolds". Yet manifolds are part of the basic vocabulary of modern mathematics, and students need to know them as intimately as they know the integers.

Gregory L. NABER. — **Topology, geometry, and gauge fields: interactions.** — Applied mathematical sciences, vol. 141. — Un vol. relié, 16,5×24,5, de XIII, 443 p. — ISBN 0-387-98947-1. — Prix: DM 139.00. — Springer, New York, 2000.

This book covers topology and geometry beginning with an accessible account of the impact of mathematical physics, especially gauge theory, on the study of the geometry and topology of manifolds. Much of the mathematics developed in the book to study the classical field theories of physics (de Rham cohomology, Chern classes, etc.) is standard, but the treatment always keeps one eye on the physics and unhesitatingly sacrifices generality to clarity. The author concludes with a brief discussion of the Seiberg-Witten invariants. Although this volume can be read independently, Naber carries on the program initiated in his earlier volume, *Topology, Geometry, and Gauge Fields: Foundations* (Springer, 1997), and writes in much the same spirit with precisely the same philosophical motivation.