Géométrie différentielle

Alfred GRAY. — **Modern differential geometry of curves and surfaces with Mathematica®.** — Second edition. — Studies in advanced mathematics. — Un vol. relié, 19×26, de xxiv, 1053 p. — ISBN 0-8493-7164-3. — Prix: DM 177.00. — CRC Press, Boca Raton, Florida, distributed by Springer-Verlag, Berlin, 1998.

With this textbook the reader will learn to reproduce and study interesting curves and surfaces – many more than are included in typical texts – using computer methods. By plotting geometric objects and studying the printed result, readers can understand concepts geometrically and see the effect of changes in parameters. The new edition features 300 Mathematica® programs and more than 300 exercises to demonstrate concepts introduced in the book. It also adds eight new chapters on global curve theory, space curves, minimal surfaces, inversions, cyclides, the Gauss-Bonnet theorem, and global surface theory, with routines for displaying curves and surfaces using Geomview and Acrospin. The text presents many historical footnotes with portraits of mathematicians.

Frank MORGAN. — **Riemannian geometry: a beginner's guide.** — 2nd ed. — Un vol. relié, 16×23,5, de x, 156 p. — ISBN 1-56881-073-3. — Prix: US$ 34.00. — A.K. Peters, Wellesley, Mass., 1998.

The author establishes the basic material early to describe the most important geometric features of curved objects from the plebeian racetrack to the grand structure of the universe. In his short text, he then moves rapidly to address more complex topics like hyperbolic geometry and the Gauss-Bonnet theorem. This second edition contains a wealth of examples and exercises and includes new material on subjects ranging from isoperimetric problems to Einstein's original paper on general relativity. It concludes with a discussion of global geometry and current research (some by undergraduates) on energy minimizing curves and more.

Topologie des variétés, analyse globale et analyse des variétés

Robert FRIEDMAN, John W. MORGAN, (Editors). — **Gauge theory and the topology of four-manifolds.** — IAS/Park City mathematics series, vol. 4. — Un vol. relié, 18,5×26,5, de x, 221 p. — ISBN 0-8218-0591-6. — Prix: £28.00. — American Mathematical Society, Providence R.I., distributed by Oxford University Press, Oxford, 1998.

David Gieseker: Geometric invariant theory and the moduli of bundles. — Jun Li: Anti-self-dual connections and stable vector bundles. — John W. Morgan: An introduction to Gauge theory. — Ronald J. Stern: Computing Donaldson invariants. — Clifford H. Taubes and James A. Bryan: Donaldson-Floer theory.

P.R. MISRA, M. RAJAGOPALAN, (Editors). — **Proceedings of the Tennessee Topology Conference.** — Tennessee State University, June 10 and 11, 1996. — Un vol. relié, 16×23, de x, 224 p. — ISBN 981-02-3291-8. — Prix: £47.00. — World Scientific, Singapore, 1997.

There were five major speakers at the conference: Melvin Henriksen: Separate vs. joint continuity: a tale of four topologies. — I. Juhász: Cardinal functions on subspaces and continuous images. — K.D. Magill, Jr.: A survey of topological nearrings and nearrings of continuous functions. — Peter Nyikos: Topologies on trees. — K. Sundaresan: Backward shifts on function spaces. Keeping applications of topology in mind special sessions in the areas of asymmetric topologies and semigroup theory were organized. All the papers contained in the proceedings have been refereed.

Vladimir Y. ROVENSKII. — **Foliations of Riemannian manifolds and submanifolds.** — Un vol. relié, 16,5×24,5, de X, 286 p. — ISBN 0-8176-3806-7. — Prix: SFr. 138.00. — Birkhäuser, Boston, 1998.

The ideas and methods of foliations are very popular in mathematics and its applications. The key problem of this volume is the role of a Riemannian curvature in studies of manifolds and submanifolds with foliations. Rovenskii discusses the results of many geometers, but the book principally focuses on his own investigations into the Riemannian geometry of foliations and submanifolds with generators having nonnegative curvature. The main idea is that such manifolds are decomposed into a direct product when the dimension of leaves is sufficiently large.

Tatsuo SUWA. — **Indices of vector fields and residues of singular holomorphic foliations.** — Actualités mathématiques. — Un vol. broché, 17,5×24, de VIII, 204 p. — ISBN 2-7056-6361-4. — Prix: FF 210.00. — Hermann, Paris, 1998.

Vector fields arise naturally in many branches of mathematics. An interesting problem in geometry is to study the relation between the structure of the space and the property of vector fields that can exist on it. A typical example is the classical Poincaré-Hopf theorem, which relates the local indices of a vector field and the Euler-Poincaré characteristic of the manifold. More generally, we come up with foliations when we consider involutive systems of vector fields. For a holomorphic foliation, we have more local invariants (residues) associated to its singularity, as initially discovered by P. Baum and R. Bott. Also, for an invariant subvariety of the foliation we have other types of residues, including the Camacho-Sad index, which play a significant role in the study of invariant subvarieties. In this book these invariants are treated systematically and generalized to the ones for vector fields and holomorphic foliations on singular varieties.

Masaya YAMAGUTI, Masayoshi HATA, and Jun KIGAMI. — **Mathematics of fractals.** — Translations of mathematical monographs, vol. 167. — Un vol. relié, 18×26, de XI, 78 p. — ISBN 0-8218-0537-1. — Prix: £19.50. — American Mathematical Society, Providence R.I., distributed by Oxford University Press, Oxford, 1997.

This book aims at providing a handy explanation of the notions behind the self-similar sets called "fractals" and "chaotic dynamical systems". The authors emphasize the beautiful relationship between fractal functions (such as Weierstrass's) and chaotic dynamical systems; these nowhere-differentiable functions are generating functions of chaotic dynamical systems. These functions are shown to be in a sense unique solutions of certain boundary problems. The last chapter of the book treats harmonic functions on fractal sets.

Probabilités et processus stochastiques

A.A. BOROVKOV. — **Ergodicity and stability of stochastic processes.** — Translated by V. Yurinsky. — Wiley series in probability and statistics. — Un vol. relié, 16×23,5, de XXIII, 585 p. — ISBN 0-471-97913-9. — Prix: £85.00.— John Wiley & Sons, Chichester, 1998.

Comprising three parts, the first demonstrates the general theorems of ergodicity and stability for a comprehensive number of classes of Markov chains, stochastically recursive sequences and their generalizations. Expanding on the introduction, the second part considers ergodicity and stability of multi-dimensional Markov chains and Markov processes. For one-dimensional Markov chains special attention is paid to large deviation problems and transient phenomenon. Drawing upon the results presented throughout the book the final part considers