

# Géométrie différentielle

Objektyp: **Chapter**

Zeitschrift: **L'Enseignement Mathématique**

Band (Jahr): **47 (2001)**

Heft 3-4: **L'ENSEIGNEMENT MATHÉMATIQUE**

PDF erstellt am: **23.07.2024**

## **Nutzungsbedingungen**

Die ETH-Bibliothek ist Anbieterin der digitalisierten Zeitschriften. Sie besitzt keine Urheberrechte an den Inhalten der Zeitschriften. Die Rechte liegen in der Regel bei den Herausgebern.

Die auf der Plattform e-periodica veröffentlichten Dokumente stehen für nicht-kommerzielle Zwecke in Lehre und Forschung sowie für die private Nutzung frei zur Verfügung. Einzelne Dateien oder Ausdrucke aus diesem Angebot können zusammen mit diesen Nutzungsbedingungen und den korrekten Herkunftsbezeichnungen weitergegeben werden.

Das Veröffentlichen von Bildern in Print- und Online-Publikationen ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. Die systematische Speicherung von Teilen des elektronischen Angebots auf anderen Servern bedarf ebenfalls des schriftlichen Einverständnisses der Rechteinhaber.

## **Haftungsausschluss**

Alle Angaben erfolgen ohne Gewähr für Vollständigkeit oder Richtigkeit. Es wird keine Haftung übernommen für Schäden durch die Verwendung von Informationen aus diesem Online-Angebot oder durch das Fehlen von Informationen. Dies gilt auch für Inhalte Dritter, die über dieses Angebot zugänglich sind.

differential geometry, topology, the theory of Lie groups and many more. The authors detail these connections, some of which are well known, but many much less so.

### *Ensembles convexes et inégalités géométriques*

Herbert EDELSBRUNNER. — **Geometry and topology for mesh generation.** — Cambridge monographs on applied and computational mathematics, vol. 6. — Un vol. relié, 16×23,5, de XII, 177 p. — ISBN 0-521-79309-2. — Prix: £29.95. — Cambridge University Press, Cambridge, 2001.

The book combines topics in mathematics (geometry and topology), computer science (algorithms), and engineering (mesh generation). The original motivation for these topics was the difficulty faced (both conceptually and in technical execution) in any attempt to combine elements of combinatorial and numerical algorithms. Mesh generation is a topic in which a meaningful combination of these different approaches to problem solving is inevitable. The book develops methods from both areas that are amenable to combination and explains recent breakthrough solutions to meshing that fit into this category.

Jack E. GRAVER. — **Counting on frameworks: mathematics to aid the design of rigid structures.** — Dolciani mathematical expositions, vol. 25. — Un vol. broché, 15×23, de XII, 180 p. — ISBN 0-8835-331-0. — Prix: £23.95. — The Mathematical Association of America, Washington, distributed by Cambridge University Press, Cambridge, 2001.

Rigidity theory is a body of mathematics developed to aid in designing structures. Consider scaffolding that is constructed by bolting together rods and beams. The ultimate question is: “Is the scaffolding sturdy enough to hold the workers and their equipment?” There are several features of the structure that have to be considered in answering this question. Just how to design properly braced scaffolding (or the basic skeleton of any structure) is the problem that motivates rigidity theory. The purpose of this book is to develop a mathematical model for rigidity.

### *Géométrie différentielle*

Lawrence CONLON. — **Differentiable manifolds.** — Birkhäuser advanced texts. — Second edition. — Un vol. relié, 17×24, de XII, 418 p. — ISBN 0-8176-4134-3. — Prix: SFr. 98.00. — Birkhäuser, Boston, 2001.

This second edition contains a significant amount of new material, which, in addition to classroom use, will make it a useful reference text. Topics that can be omitted safely in a first course are clearly marked, making this edition easier to use for such a course, as well as for private study by non-specialists wishing to survey the field. The themes of linearization, (re)integration, and global versus local calculus are emphasized throughout. Additional features include a treatment of the elements of multivariable calculus, formulated to adapt readily to the global context, an exploration of bundle theory, and a further (optional) development of Lie theory than is customary in textbooks at this level.

Seán DINEEN. — **Multivariate calculus and geometry.** — Springer undergraduate mathematics series. — Second edition. — Un vol. broché, 17×24, de XII, 254 p. — ISBN 1-85233-472-X. — Prix: DM 59.00. — Springer, London, 2001.

In this revised edition, which includes additional exercises and expanded solutions, Seán Dineen gives a solid description of the basic concepts, via simple familiar examples which are then tested in technically demanding situations. The author recognises the varied backgrounds students bring to the subject and only assumes the minimal prerequisite knowledge necessary for

a comprehensive and unified understanding of the differential, integral and geometric calculus of several variables. On reading this book the student will acquire the confidence and techniques necessary to tackle new problems.

James EELLS, Bent FUGLEDE. — **Harmonic maps between Riemannian polyhedra.** — Cambridge tracts in mathematics, vol. 142. — Un vol. relié, 16×24, de XII, 296 p. — ISBN 0-521-77311-3. — Prix: £40.00. — Cambridge University Press, Cambridge, 2001.

Harmonic maps between smooth Riemannian manifolds play a ubiquitous role in differential geometry. This book extends the theory in full detail to harmonic maps between broad classes of singular Riemannian polyhedra, with many examples being given. The analytical foundation is based on existence and regularity results which use the potential theory of Riemannian polyhedral domains viewed as Brelot harmonic spaces and geodesic space targets in the sense of Alexandrov and Busemann. The authors set out much new material on harmonic maps between singular spaces for the first time in book form.

C.G. GIBSON. — **Elementary geometry of differentiable curves: an undergraduate introduction.** — Un vol. broché, 15×23, de XVII, 216 p. — ISBN 0-521-01107-8. — Prix: £16.95. — Cambridge University Press, Cambridge, 2001.

The basic concepts of the book are illustrated by named curves, of historical and scientific significance, leading to the central idea of curvature. The singular viewpoint is represented by a study of contact with lines and circles, illuminating the ideas of cusp, inflexion and vertex. There are two major physical applications. Caustics are discussed via the central concepts of evolute and orthotomic. The final chapters introduce the core material of classical kinematics, developing the geometry of trajectories via the ideas of roulettes and centrodes, and culminating in the inflexion circle and cubic of stationary curvature.

Frédéric HÉLEIN. — **Constant mean curvature surfaces, harmonic maps and integrable systems.** — Lectures in mathematics, ETH Zürich. — Un vol. broché, 17×24, de 122 p. — ISBN 3-7643-6576-5. — Prix: SFr. 38.00. — Birkhäuser, Basel, 2001.

This book intends to give an introduction to harmonic maps between a surface and a symmetric manifold and constant mean curvature surfaces as completely integrable systems. It is among the first textbooks about integrable systems, their interplay with harmonic maps and the use of loop groups, and it presents the theory, for the first time, from the point of view of a differential geometer. The most important results are exposed with complete proofs. Some proofs have been completely rewritten with the objective, in particular, to clarify the relation between finite mean curvature tori, Wente tori and the loop group approach – an aspect largely neglected in the literature.

## ***Topologie générale***

Peter A. FIRBY, Cyril F. GARDINER. — **Surface topology.** — 3<sup>rd</sup> edition. — Horwood Publishing series in mathematics and applications. — Un vol. relié, 17×25, de 242 p. — ISBN 1-898563-77-2. — Prix: £25.00. — Horwood Publishing, Westergate, Chichester, 2001.

The book provides a straightforward treatment of an area particularly important for its richness of applications and variety of interactions with other branches of mathematics, e.g., surface topology, graph theory, group theory, vector field theory, plane Euclidean and non-Euclidean geometry, and knot theory; each topic treated from its beginnings. Significant theory is developed by elementary means, thereby providing understanding and enjoyment of this attractive branch of modern mathematics. — *Contents*: Intuitive ideas. – Plane models of