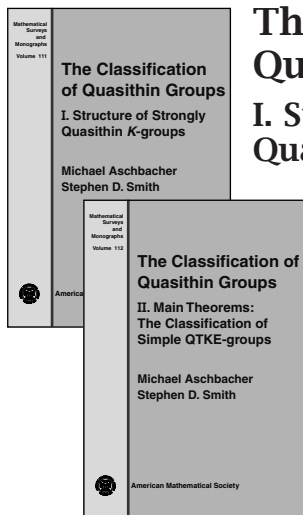


# New Publications Offered by the AMS

## Algebra and Algebraic Geometry



### The Classification of Quasithin Groups I. Structure of Strongly Quasithin K-groups

### II. Main Theorems: The Classification of Simple QTKE-groups

Michael Aschbacher,  
California Institute of  
Technology, Pasadena,  
and Stephen D. Smith,  
University of Illinois at  
Chicago

Around 1980, G. Mason announced the classification of a certain subclass of an important class of finite simple groups known as “quasithin groups”. The classification of the finite simple groups depends upon a proof that there are no unexpected groups in this subclass. Unfortunately Mason neither completed nor published his work. In the Main Theorem of this two-part book (Volumes 111 and 112 in the AMS series, Mathematical Surveys and Monographs) the authors provide a proof of a stronger theorem classifying a larger class of groups, which is independent of Mason’s arguments. In particular, this allows the authors to close this last remaining gap in the proof of the classification of all finite simple groups.

An important corollary of the Main Theorem provides a bridge to the program of Gorenstein, Lyons, and Solomon (Volume 40 in the AMS series, Mathematical Surveys and Monographs) which seeks to give a new, simplified proof of the classification of the finite simple groups.

Part I (Volume 111) contains results which are used in the proof of the Main Theorem. Some of the results are known and fairly general, but their proofs are scattered throughout the literature; others are more specialized and are proved here for the first time.

Part II of the work (Volume 112) contains the proof of the Main Theorem, and the proof of the corollary classifying quasithin groups of even type.

The book is suitable for graduate students and researchers interested in the theory of finite groups.

**Contents:** *Volume I: Structure of strongly quasithin  $\mathcal{K}$ -groups:* Introduction to volume I; Elementary group theory and the known quasithin groups; Basic results related to failure of factorization; Pushing-up in SQTk-groups; The *qrc*-lemma and modules with  $\hat{q} \leq 2$ ; Generation and weak closure; Weak BN-pairs and amalgams; Various representation-theoretic lemmas; Parameters for some modules; Statements of some quoted results; A characterization of the Rudvalis group; Modules for SQTk-groups with  $\hat{q}(G, V) \leq 2$ ; *Bibliography and index:* Background references quoted (Part 1: also used by GLS); Background references quoted (Part 2: used by us but not by GLS); Expository references mentioned; Index.

**Contents:** *Volume II: Main theorems; the classification of simple QTKE-groups:* Structure of QTKE-groups and the main case division; Structure and intersection properties of 2-locals; Classifying the groups with  $|\mathcal{M}(T)| = 1$ ; Determining the cases for  $L \in \mathcal{L}_f^*(GT)$ ; Pushing up in QTKE-groups; *The treatment of the generic case:* The generic case:  $L_2(2^n)$  in  $\mathcal{L}_f$  and  $n(H) > 1$ ; Reducing  $L_2(2^n)$  to  $n = 2$  and  $V$  orthogonal; *Modules which are not FF-modules:* Eliminating cases corresponding to no shadow; Eliminating shadows and characterizing the  $J_4$  example; Eliminating  $\Omega_4^+(2^n)$  on its orthogonal module; *Pairs in the FSU over  $F_{2^n}$  for  $n > 1$ :* The case  $L \in \mathcal{L}_f^*(G, T)$  not normal in  $M$ ; Elimination of  $L_3(2^n), Sp_4(2^n)$ , and  $G_2(2^n)$  for  $n > 1$ ; *Groups over  $F_2$ :* Larger groups over  $F_2$  in  $\mathcal{L}_f^*(G, T)$ ; Mid-size groups over  $F_2$ ;  $L_3(2)$  in the FSU, and  $L_2(2)$  when  $\mathcal{L}_f(G, T)$  is empty; *The case  $\mathcal{L}_f(G, T)$  empty:* The case  $\mathcal{L}_f(G, T) = \emptyset$ ; *The even type theorem:* Quasithin groups of even type but not even characteristic; *Bibliography and index:* Background references quoted (Part 1: also used by GLS); Background references quoted (Part 2: used by us but not by GLS); Expository references mentioned; Index.

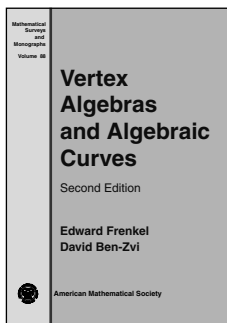
### Mathematical Surveys and Monographs

#### Volume 111

August 2004, approximately 496 pages, Hardcover, ISBN 0-8218-3410-X, 2000 *Mathematics Subject Classification:* 20D05; 20C20, **All AMS members \$79**, List \$99, Order code SURV/111N

#### Volume 112

August 2004, approximately 800 pages, Hardcover, ISBN 0-8218-3411-8, 2000 *Mathematics Subject Classification:* 20D05; 20C20, **All AMS members \$103**, List \$129, Order code SURV/112N



## Vertex Algebras and Algebraic Curves Second Edition

Edward Frenkel, *University of California, Berkeley*, and  
David Ben-Zvi, *University of Chicago*



*From a review of the first edition:*

*The authors give a deep new insight into the theory of vertex algebras ... many original results, important new concepts and very nice interpretations of structural results in the theory of vertex algebras ... provides a natural link with earlier approaches to vertex algebras ... The authors also present an excellent introduction to the theory of Wakimoto modules and  $\mathcal{W}$ -algebras ... contains many new concepts and results that are important for the modern theory of vertex algebras.*

—*Mathematical Reviews, Featured Review*

Vertex algebras are algebraic objects that encapsulate the concept of operator product expansion from two-dimensional conformal field theory. Vertex algebras are fast becoming ubiquitous in many areas of modern mathematics, with applications to representation theory, algebraic geometry, the theory of finite groups, modular functions, topology, integrable systems, and combinatorics.

This book is an introduction to the theory of vertex algebras with a particular emphasis on the relationship with the geometry of algebraic curves. The notion of a vertex algebra is introduced in a coordinate-independent way, so that vertex operators become well defined on arbitrary smooth algebraic curves, possibly equipped with additional data, such as a vector bundle. Vertex algebras then appear as the algebraic objects encoding the geometric structure of various moduli spaces associated with algebraic curves. Therefore they may be used to give a geometric interpretation of various questions of representation theory.

The book contains many original results, introduces important new concepts, and brings new insights into the theory of vertex algebras. The authors have made a great effort to make the book self-contained and accessible to readers of all backgrounds. Reviewers of the first edition anticipated that it would have a long-lasting influence on this exciting field of mathematics and would be very useful for graduate students and researchers interested in the subject.

This second edition, substantially improved and expanded, includes several new topics, in particular an introduction to the Beilinson-Drinfeld theory of factorization algebras and the geometric Langlands correspondence.

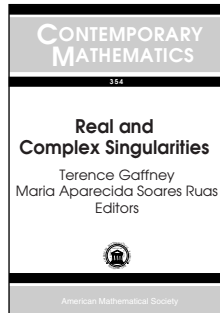
The book is suitable for graduate students and research mathematicians interested in representation theory, algebraic geometry, and mathematical physics.

**Contents:** Definition of vertex algebras; Vertex algebras associated to Lie algebras; Associativity and operator product expansion; Applications of the operator product expansion; Modules over vertex algebras and more examples; Vertex algebra bundles; Action of internal symmetries; Vertex algebra bundles: Examples; Conformal blocks I; Conformal blocks II;

Free field realization I; Free field realization II; The Knizhnik-Zamolodchikov equations; Solving the KZ equations; Quantum Drinfeld-Sokolov reduction and  $\mathcal{W}$ -algebras; Vertex Lie algebras and classical limits; Vertex algebras and moduli spaces I; Vertex algebras and moduli spaces II; Chiral algebras; Factorization; Appendix; Bibliography; Index; List of frequently used notation.

**Mathematical Surveys and Monographs**, Volume 88

August 2004, 400 pages, Softcover, ISBN 0-8218-3674-9, LC 2004051904, 2000 *Mathematics Subject Classification*: 17B69; 81R10, 81T40, 17B65, 17B67, 17B68, 14D20, 14D21, 14H10, 14H60, 14H81, **All AMS members \$55, List \$69, Order code SURV/88.RN**



## Real and Complex Singularities

Terence Gaffney, *Northeastern University, Boston, MA*, and  
Maria Aparecida Soares Ruas, *Instituto de Ciências Matemáticas e de Computação, São Carlos, São Paulo, Brazil*,

Editors

The Workshop on Real and Complex Singularities is held every other year at the Instituto de Ciências Matemáticas e de Computação (São Carlos, Brazil) and brings together specialists in the vanguard of singularities and its applications. This volume contains articles contributed by participants of the seventh workshop.

The included papers reflect Fields Medalist René Thom's original vision of singularities and represent all branches of the subject: equisingularity of sets and mappings, the geometry of singular complex analytic sets, singularities of mappings and their elimination, characteristic classes, applications to differential geometry, differential equations, and bifurcation theory.

The book is suitable for graduate students and researchers interested in singularity theory.

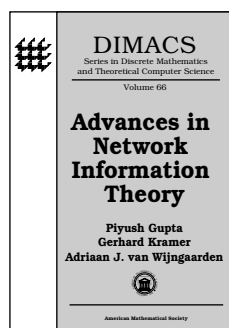
**Contents:** J. W. Bruce, G. J. Fletcher, and F. Tari, Zero curves of families of curve congruences; A. Dimca and A. Némethi, Hypersurface complements, Alexander modules and monodromy; D. Dreibelbis, Invariance of the diagonal contribution in a bitangency formula; E. Esteves and S. L. Kleiman, Bounds on leaves of foliations of the plane; L. Fehér and R. Rimányi, Calculation of Thom polynomials and other cohomological obstructions for group actions; A. C. G. Fernandes and C. H. Soares, Jr., On the bilipschitz triviality of families of real maps; J.-E. Furter and A. M. Sitta, A note on the path formulation for  $(\mathbb{O}(2), \mathbb{S}\mathbb{O}(2))$ -forced symmetry breaking bifurcation; T. Gaffney, Polar methods, invariants of pairs of modules and equisingularity; I. S. Labouriau and C. M. S. G. Rito, Stability of equilibria in equations of Hodgkin-Huxley type; A. Libgober, Isolated non-normal crossings; A. Némethi, Invariants of normal surface singularities; R. D. S. Oliveira, Families of pairs of Hamiltonian vector fields in the plane; A. A. du Plessis and C. T. C. Wall, Topology of unfoldings of singularities in the  $E$ ,  $Z$  and  $Q$  series; M. C. Romero-Fuster, Semiumbilics and geometrical dynamics

on surfaces in 4-spaces; **D. Siersma** and **M. Tibār**, On the vanishing cycles of a meromorphic function on the complement of its poles; **J. Stevens**, Some adjacencies to cusp singularities; **A. Szűcs**, Elimination of singularities by cobordism.

**Contemporary Mathematics**, Volume 354

September 2004, 324 pages, Softcover, ISBN 0-8218-3665-X, LC 2004040314, 2000 *Mathematics Subject Classification*: 32Sxx, 58Kxx, 37G10, 37G40, 53A05, **All AMS members \$71**, List \$89, Order code CONM/354N

## Applications



### Advances in Network Information Theory

**Piyush Gupta**,  
**Gerhard Kramer**, and  
**Adriaan J. van Wijngaarden**,  
*Bell Laboratories, Lucent Technologies, Murray Hill, NJ*,  
Editors

This book is a collection of articles written by leading researchers in information theory stemming from the DIMACS Workshop on Network Information held at Rutgers University (Piscataway, NJ). The articles focus on problems concerning efficient and reliable communication in multi-terminal settings. Information theory has recently attracted renewed attention because of key developments spawning challenging research problems.

The material is divided into four parts: "Information Theory for Sources", which concentrates on network source coding problems; "Information Theory for Channels", where channels, rather than sources, are central to the problem; "Information Theory for Sources and Channels", which addresses both source and channel coding; and "Coding", which deals with more practical issues. Mathematicians using applications such as wireless cellular and LAN data services, ad hoc networks and sensor networks will benefit from the developments outlined in these sections. The book is suitable for graduate students and research mathematicians interested in communications and network information theory.

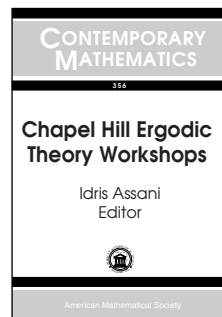
**Contents:** *Part I. Information theory for sources:* **A. Faridi**, **K. Sayrafian-Pour**, **M. Alasti**, and **A. Ephremides**, Source coding and parallel routing; **S. A. Savari**, Compressing a representation of events in a concurrent system; **P. Viswanath**, Sum rate of a class of multiterminal Gaussian source coding problems; **F. M. J. Willems** and **T. Kalker**, Coding theorems for reversible embedding; *Part II. Information theory for channels:* **A. S. Cohen** and **R. Zamir**, Unbounded loss in writing on dirty paper is possible; **R. J. La** and **V. Anatharam**, A game-theoretic look at the Gaussian multiaccess channel; **X. Liu** and **R. Srikant**, Bounds on the sum timing capacity of single-server queues with multiple input and output terminals; **S. Raj**, **E. Telatar**, and **D. Tse**, Job scheduling and multiple access; **D. Tuninetti** and **S. Shamai (Shitz)**, Fading Gaussian broadcast channels with state information at the receivers; **L.-L. Xie** and **P. R. Kumar**, Wireless network information theory; **W. Yu**, The

structure of least-favorable noise in Gaussian vector broadcast channels; *Part III. Information theory for sources and channels:* **J. Barros** and **S. D. Servetto**, Coding theorems for the sensor reachback problem with partially cooperating nodes; **M. Effros**, **M. Médard**, **T. Ho**, **S. Ray**, **D. Karger**, **R. Koetter**, and **B. Hassibi**, Linear network codes: A unified framework for source, channel, and network coding; **M. Gastpar**, On source-channel communication in networks; **S. S. Pradhan** and **K. Ramchandran**, Duality in multi-user source and channel coding; *Part IV. Coding:* **G. Caire**, **S. Shamai**, and **S. Verdú**, Noiseless data compression with low-density parity-check codes; **S. N. Diggavi**, **N. Al-Dhahir**, and **A. R. Calderbank**, Diversity embedding in multiple antenna communications; **E. Erkip**, **A. Sendonaris**, **A. Stefanov**, and **B. Aazhang**, Cooperative communication in wireless systems; **E. Soljanin**, **R. Liu**, and **P. Spasojevic**, Hybrid ARQ with random transmission assignments; **J. K. Wolf**, An information-theoretic approach to bit-stuffing for network protocols.

**DIMACS: Series in Discrete Mathematics and Theoretical Computer Science**, Volume 66

September 2004, 339 pages, Hardcover, ISBN 0-8218-3467-3, LC 2004051900, 2000 *Mathematics Subject Classification*: 94A15, 94A17, 94A40, 94A05, 94A29, 94A24, 94B35, 94-06, **All AMS members \$79**, List \$99, Order code DIMACS/66N

## Differential Equations



### Chapel Hill Ergodic Theory Workshops

**Idris Assani**, *University of North Carolina, Chapel Hill*,  
Editor

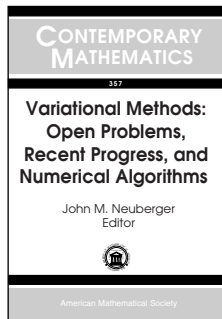
This volume grew out of two ergodic theory workshops held at the University of North Carolina at Chapel Hill. These events gave young researchers an introduction to active research

areas and promoted interaction between young and established mathematicians. Included are research and survey articles devoted to various topics in ergodic theory. The book is suitable for graduate students and researchers interested in these and related areas.

**Contents:** **E. Akin**, Why is the  $3x + 1$  problem hard?; **E. Akin**, Lectures on Cantor and Mycielski sets for dynamical systems; **I. Assani**, Duality and the one-sided ergodic Hilbert transform; **J. Auslander** and **K. Berg**, Rigidity conditions in topological dynamics related to a theorem of George Sell; **G. Cohen**, **R. L. Jones**, and **M. Lin**, On strong laws of large numbers with rates; **C. Demeter** and **R. L. Jones**, Besicovitch weights and the necessity of duality restrictions in the weighted ergodic theorem; **R. L. Jones**, Strong sweeping out for lacunary sequences; **I. Kornfeld**, Some old and new Rokhlin towers.

**Contemporary Mathematics**, Volume 356

September 2004, 169 pages, Softcover, ISBN 0-8218-3313-8, LC 2004046326, 2000 *Mathematics Subject Classification*: 11K55, 28D05, 37A30, 37B20, 42A16, 47A35, 60F15, **All AMS members \$47**, List \$59, Order code CONM/356N



## Variational Methods: Open Problems, Recent Progress, and Numerical Algorithms

John M. Neuberger, *Northern Arizona University, Flagstaff*,  
Editor

This volume contains the proceedings of the conference on Variational Methods: Open Problems, Recent Progress, and Numerical Algorithms. It presents current research in variational methods as applied to nonlinear elliptic PDE, although several articles concern nonlinear PDE that are nonvariational and/or nonelliptic. The book contains both survey and research papers discussing important open questions and offering suggestions on analytical and numerical techniques for solving those open problems.

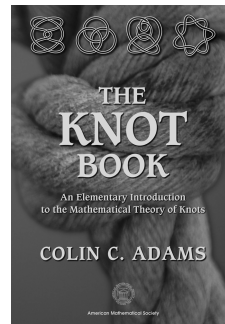
It is suitable for graduate students and research mathematicians interested in elliptic partial differential equations.

**Contents:** A. Castro, Semilinear equations with discrete spectrum; G. Chen, Y. Deng, W.-M. Ni, and J. Zhou, Semilinear elliptic boundary value problems with nonlinear oblique boundary conditions, a boundary element monotone iteration approach; G. Chen, Z. Ding, C.-R. Hu, W.-M. Ni, and J. Zhou, A note on the elliptic Sine-Gordon equation; G. Chen, B. G. Englert, and J. Zhou, Convergence analysis of an optimal scaling algorithm for semilinear elliptic boundary value problems; J. W. Neuberger and R. J. Renka, Sobolev gradients: Introduction, applications, problems; D. G. Costa and H. Tehrani, Unbounded perturbations of resonant Schrodinger equations; J. Čepička, P. Drábek, and P. Girg, Quasilinear boundary value problems: Existence and multiplicity results; P. Drábek and S. B. Robinson, Eigenvalue problems, resonance problems and open problems; P. Padilla, Variational, dynamic and geometric aspects of some nonlinear problems; V. L. Shapiro, The perturbed  $p$ -Laplacian and quadratic growth; I. Knowles, Variational methods for ill-posed problems; J. M. Neuberger, GNGA: Recent progress and open problems for semilinear elliptic PDE; F. Catrina, Critical nonlinearities and symmetric solutions; J. A. Iaiá, Non-convergent radial solutions of a semilinear elliptic equation in  $\mathbb{R}^N$ ; Z. Feng, Traveling wave solutions to nonlinear evolution equations.

**Contemporary Mathematics**, Volume 357

September 2004, 285 pages, Softcover, ISBN 0-8218-3339-1, LC 2004049919, 2000 *Mathematics Subject Classification*: 35Axx, 35Jxx, 35J20, 35J60, 65K10, 65Nxx, 65N25, 65N30, 65N38, All AMS members \$63, List \$79, Order code CONM/357N

## Geometry and Topology



## The Knot Book An Elementary Introduction to the Mathematical Theory of Knots

Colin C. Adams, *Williams College, Williamstown, MA*

*From reviews of the first edition:*

*Amazingly understandable ... After reading it twice, I still pick it up and scan it ... this book belongs in every mathematical library.*

—Charles Ashbacher, *Book Reviews Editor, Journal of Recreational Mathematics*

*Throughout the book there are lots of exercises of various degrees of difficulty. Many “unsolved questions” provide opportunity for further research. I liked reading this book.*

—Zentralblatt MATH

Knots are familiar objects. We use them to moor our boats, to wrap our packages, to tie our shoes. Yet the mathematical theory of knots quickly leads to deep results in topology and geometry. *The Knot Book* is an introduction to this rich theory, starting with our familiar understanding of knots and a bit of college algebra and finishing with exciting topics of current research.

*The Knot Book* is also about the excitement of *doing* mathematics. Colin Adams engages the reader with fascinating examples, superb figures, and thought-provoking ideas. He also presents the remarkable applications of knot theory to modern chemistry, biology, and physics.

This is a compelling book that will comfortably escort you into the marvelous world of knot theory. Whether you are a mathematics student, someone working in a related field, or an amateur mathematician, you will find much of interest in *The Knot Book*.

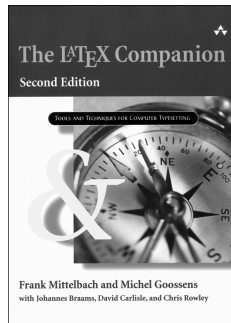
Colin Adams received the Mathematical Association of America (MAA) Award for Distinguished Teaching and has been an MAA Polya Lecturer and a Sigma Xi Distinguished Lecturer.

**Contents:** Introduction; Tabulating knots; Invariants of knots; Surfaces and knots; Types of knots; Polynomials; Biology, chemistry, and physics; Knots, links, and graphs; Topology; Higher dimensional knotting; Knot jokes and pastimes; Appendix; Suggested readings and references; Index; Corrections to the 2004 AMS printing.

August 2004, 307 pages, Softcover, ISBN 0-8218-3678-1, LC 2004054429, 2000 *Mathematics Subject Classification*: 57-01, 57Mxx, 57M25, 57M27, 57M50, All AMS members \$23, List \$29, Order code KNOTN

# New AMS-Distributed Publications

## General and Interdisciplinary



### The L<sup>A</sup>T<sub>E</sub>X Companion, Second Edition Tools and Techniques for Computer Typesetting

Frank Mittelbach, *University of Mainz, Germany*, Michel Goossens, *European*

*Organization for Nuclear Research, CERN, Genève, Switzerland*, Johannes Braams, *Royal KPN N V, The Hague, Netherlands*, David Carlisle, *NAG, Ltd., Oxford, England*, and Chris Rowley, *Open University, Milton Keynes, England*

The L<sup>A</sup>T<sub>E</sub>X Companion has long been the essential resource for anyone using L<sup>A</sup>T<sub>E</sub>X to create high-quality printed documents. This completely updated edition brings you all the latest information about L<sup>A</sup>T<sub>E</sub>X and the vast range of add-on packages now available—over 200 are covered! Full of new tips and tricks for using L<sup>A</sup>T<sub>E</sub>X in both traditional and modern typesetting, this book will also show you how to customize layout features to your own needs—from phrases and paragraphs to headings, lists, and pages.

#### Inside you'll find:

- Expert advice on using L<sup>A</sup>T<sub>E</sub>X's basic formatting tools to create all types of publications—from memos to encyclopedias
- In-depth coverage of important extension packages for tabular and technical typesetting, floats and captions, multicolumn layouts—including reference guides and discussions of the underlying typographic and TeXnical concepts
- Detailed techniques for generating and typesetting contents lists, bibliographies, indexes, etc.
- Tips and tricks for L<sup>A</sup>T<sub>E</sub>X programmers and systems support

#### New to this edition:

- Nearly 1,000 fully tested examples that illustrate the text and solve typographical and technical problems—all ready to run!
- An additional chapter on citations and bibliographies
- Expanded material on the setup and use of fonts to access a huge collection of glyphs and to typeset text from a wide range of languages and cultures
- Major new packages for graphics, “verbatim” listings, floats, and page layout
- Full coverage of the latest packages for all types of documents—mathematical, multilingual, and many more
- Detailed help on all error messages, including those troublesome low-level T<sub>E</sub>X errors

Like its predecessor, this book is an indispensable reference for anyone wishing to use L<sup>A</sup>T<sub>E</sub>X productively.

All of the authors have over ten years of varied experience working with L<sup>A</sup>T<sub>E</sub>X-related software systems. All but one are active members of the L<sup>A</sup>T<sub>E</sub>X3 Project Team, developing and maintaining the core L<sup>A</sup>T<sub>E</sub>X system.

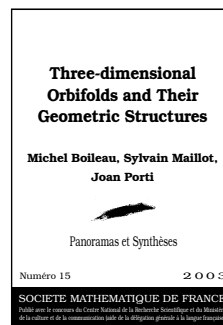
The book comes with an accompanying CD-ROM which has complete plug-and-play L<sup>A</sup>T<sub>E</sub>X installation, including all the packages and examples featured in the book.

Published by Addison-Wesley. Distributed non-exclusively worldwide by the American Mathematical Society.

**Contents:** Introduction; The structure of a L<sup>A</sup>T<sub>E</sub>X document; Basic formatting tools; The layout of the page; Tabular material; Mastering floats; Fonts and encodings; Higher mathematics; L<sup>A</sup>T<sub>E</sub>X in a multilingual environment; Graphics generation and manipulation; Index generation; Managing citations; Bibliography generation; L<sup>A</sup>T<sub>E</sub>X package documentation tools; A L<sup>A</sup>T<sub>E</sub>X overview for preamble, package, and class writers; Tracing and resolving problems; L<sup>A</sup>T<sub>E</sub>X software and user group information; TLC2 T<sub>E</sub>X CD; Bibliography; Index of commands and concepts; People; Biographies; Production notes.

April 2004, 1087 pages, Softcover, ISBN 0-201-36299-6, 2000 *Mathematics Subject Classification:* 00-XX; 00A20, 68N15, **Individual member \$54**, List \$59.99, Order code LATEXCN

## Geometry and Topology



### Three-dimensional Orbifolds and Their Geometric Structures

Michel Boileau, *Université Paul Sabatier, Toulouse, France*, Sylvain Maillot, *Université Louis Pasteur, Strasbourg, France*, and Joan Porti, *Universitat Autònoma de Barcelona, Bellaterra, Spain*

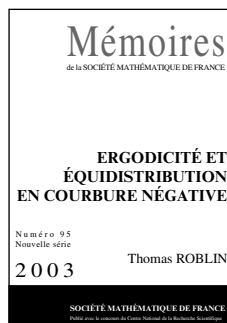
Orbifolds locally look like quotients of manifolds by finite group actions. They play an important role in the study of proper actions of discrete groups on manifolds. This monograph presents recent fundamental results on the geometry and topology of 3-dimensional orbifolds, with an emphasis on their geometric properties. It is suitable for graduate students and research mathematicians interested in geometry and topology.

A publication of the Société Mathématique de France, Marseilles (SMF), distributed by the AMS in the U.S., Canada, and Mexico. Orders from other countries should be sent to the SMF. Members of the SMF receive a 30% discount from list.

**Contents:** Introduction; Thurston's eight geometries; Orbifolds; Decompositions of orientable 3-orbifolds; Haken orbifolds; Seifert orbifolds; Hyperbolic orbifolds; Varieties of representations; Volumes and hyperbolic Dehn filling; The Orbifold Theorem; Bibliography; Index.

**Panoramas et Synthèses**, Number 15

May 2004, 167 pages, Softcover, ISBN 2-85629-152-X, 2000 *Mathematics Subject Classification:* 57M50; 20F69, 53C23, 57M60, **Individual member \$32**, List \$36, Order code PASY/15N



## Ergodicité et équadistribution en courbure négative

Thomas Roblin, *Université de Paris, France*

In this book, the author considers a discrete isometry group acting on a  $CAT(-1)$  space and successively establishes, by new and elementary methods, an ergodicity theorem for

the associated horospherical foliation, then mixing of the geodesic flow, orbital equidistribution of the group, with first asymptotic for the orbital counting function, equidistribution of primitive closed geodesics with, in the geometrically finite case, asymptotic counting. Finally, he proves a general unique ergodicity theorem for the horospherical foliation for groups with finite Bowen-Margulis-Sullivan measure. Those various results are new in their generality. Text is in French.

A publication of the Société Mathématique de France, Marseilles (SMF), distributed by the AMS in the U.S., Canada, and Mexico. Orders from other countries should be sent to the SMF. Members of the SMF receive a 30% discount from list.

**Contents:** Introduction; Préliminaires; Ergodicité du feuilletage horosphérique; Mélange du flot géodésique; Dénombrement et équadistribution asymptotique des orbites; Équadistribution asymptotique des géodésiques fermées primitives; Moyennes horosphériques et classification des mesures invariantes; Bibliographie.

**Mémoires de la Société Mathématique de France**, Number 95

April 2004, 96 pages, Softcover, ISBN 2-85629-147-3, 2000

*Mathematics Subject Classification:* 37D40, 37F35, **Individual member \$32**, List \$36, Order code SMFMEM/95N