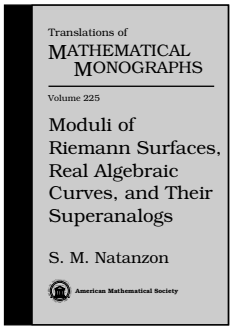
New Publications Offered by the AMS

Algebra and Algebraic Geometry



Moduli of Riemann Surfaces, Real Algebraic Curves, and Their Superanalogs

S. M. Natanzon, *Moscow State University, Russia, and Independent University of Moscow, Russia*

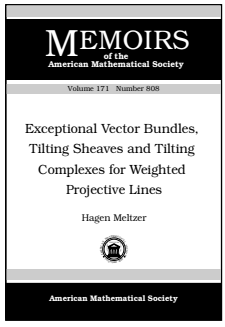
The space of all Riemann surfaces (the so-called moduli space) plays an important role in algebraic geometry and its applications to quantum field theory. The present book is devoted to the study of topological properties of this space and of similar moduli spaces, such as the space of real algebraic curves, the space of mappings, and also superanalogs of all these spaces.

The book can be used by researchers and graduate students working in algebraic geometry, topology, and mathematical physics.

Contents: Introduction; Moduli of Riemann surfaces, Hurwitz type spaces and their superanalogs; Moduli of real algebraic curves and their superanalogs. Differentials, spinors, and Jacobians of real curves; Spaces of meromorphic functions on complex and real algebraic curves; Bibliography; Index.

Translations of Mathematical Monographs, Volume 225

September 2004, 160 pages, Hardcover, ISBN 0-8218-3594-7, LC 2004051990, 2000 *Mathematics Subject Classification*: 14H15, 32G15; 14H40, 14M30, 14P25, 30F35, 30F60, 32C11, 57M12, **All AMS members $47**, List $59, Order code MMONO/225N



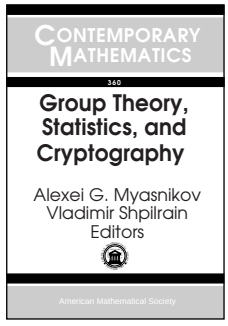
Exceptional Vector Bundles, Tilting Sheaves and Tilting Complexes for Weighted Projective Lines

Hagen Meltzer, *Szczecin University, Poland*

Contents: Background; Summary; Weighted projective lines; Mutations of exceptional sequences; Tubular mutations; Twisted mutations; On the number of exceptional vector bundles; Tilting sheaves; Tilting complexes; Hyperelliptic weighted projective lines; Bibliography; Index.

Memoirs of the American Mathematical Society, Volume 171, Number 808

July 2004, 139 pages, Softcover, ISBN 0-8218-3519-X, LC 2004049173, 2000 *Mathematics Subject Classification*: 14F05, 16G10; 16G70, 16G60, **Individual member $35**, List $58, Institutional member $46, Order code MEMO/171/808N



Group Theory, Statistics, and Cryptography

Alexei G. Myasnikov and **Vladimir Shpilrain**, *City College of New York, NY*, Editors

This volume consists of contributions by speakers at the AMS Special Session on Combinatorial and Statistical Group Theory held at New York University. Readers will find a variety of contributions, including survey papers on applications of group theory in cryptography, research papers on various aspects of statistical group theory, and papers on more traditional combinatorial group theory.

The book is suitable for graduate students and research mathematicians interested in group theory and its applications to cryptography.

This item will also be of interest to those working in applications.

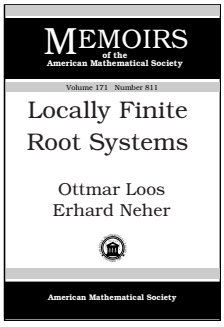
Contents: P. Ackermann, **V. große Rebel**, and **G. Rosenberger**, On power- and commutation transitive, power commutative, and restricted Gromov groups; **P. Dehornoy**, Braid-based cryptography; **B. Fine**, **A. M. Gaglione**, and **D. Spellman**, Discriminating and square-like groups I: Axiomatics; **R. Z. Goldstein**, The density of small words in a free group is 0; **S. P. Humphries**, Braid groups and Aut(F_2) are not rigid; **S. V. Ivanov** and **A. M. Storozhev**, On varieties of groups in which all periodic groups are abelian; **O. G. Kharlampovich**, **A. G. Myasnikov**, **V. N. Remeslennikov**, and **D. E. Serbin**, Subgroups of fully residually free groups: Algorithmic problems; **D. V. Osin**, Weak hyperbolicity and free constructions; **I. Rivin**, Some properties of the conjugacy class growth function; **E. C. Turner** and **C. F. Rocca**, Boundary test elements; **L. Sabalka**, Geodesics in the braid group on three strands; **L. M. Shneerson**, Remarks on the growth of inverse semigroups; **V. Shpilrain**, Assessing security of some group based cryptosystems.

Contemporary Mathematics, Volume 360

November 2004, 177 pages, Softcover, ISBN 0-8218-3444-4, LC 2004050202, 2000 *Mathematics Subject Classification*: 20–XX, 57Mxx, 68P25, 68Qxx, 94A60, **All AMS members $47**, List $59, Order code CONM/360N

Locally Finite Root Systems

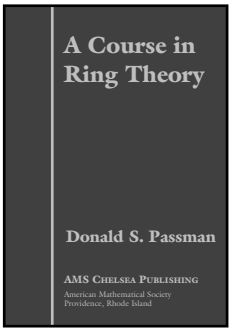
Ottmar Loos, *University of Innsbruck, Austria*, and **Erhard Neher**, *University of Ottawa, ON, Canada*



Contents: Introduction; The category of sets in vector spaces; Finiteness conditions and bases; Locally finite root systems; Invariant inner products and the coroot system; Weyl groups; Integral bases, root bases and Dynkin diagrams; Weights and coweights; Classification; More on Weyl groups and automorphism groups; Parabolic subsets and positive systems for symmetric sets in vector spaces; Parabolic subsets of root systems and presentations of the root lattice and the Weyl group; Closed and full subsystems of finite and infinite classical root systems; Parabolic subsets of root systems: classification; Positive systems in root systems; Positive linear forms and facets; Dominant and fundamental weights; Gradings of root systems; Elementary relations and graphs in 3-graded root systems; Some standard results on finite root systems; Cones defined by totally preordered sets; Bibliography; Index of notations; Index.

Memoirs of the American Mathematical Society, Volume 171, Number 811

July 2004, 214 pages, Softcover, ISBN 0-8218-3546-7, LC 2004049174, 2000 *Mathematics Subject Classification*: 17B10, 17B20, 20F55, **Individual member $31**, List $51, Institutional member $41, Order code MEMO/171/811N



A Course in Ring Theory

Donald S. Passman, *University of Wisconsin, Madison*

"There seems to be an emerging consensus as to what material should constitute the core of a first course in module-theoretic ring theory ... The book ... is definitely within the bounds of that consensus ... presentation is clear, the proofs are often quite ingenious and the exercises are well chosen ... definitely suitable for use as a textbook."

—MathSciNet

First published in 1991, this book contains the core material for an undergraduate first course in ring theory. Using the underlying theme of projective and injective modules, the author touches upon various aspects of commutative and noncommutative ring theory. In particular, a number of major results are highlighted and proved.

The first part of the book, called "Projective Modules", begins with basic module theory and then proceeds to surveying various special classes of rings (Wedderburn, Artinian and Noetherian rings, hereditary rings, Dedekind domains, etc.). This part concludes with an introduction and discussion of the concepts of the projective dimension.

Part II, "Polynomial Rings", studies these rings in a mildly noncommutative setting. Some of the results proved include the Hilbert Syzygy Theorem (in the commutative case) and the Hilbert Nullstellensatz (for almost commutative rings).

Part III, "Injective Modules", includes, in particular, various notions of the ring of quotients, the Goldie Theorems, and the characterization of the injective modules over Noetherian rings.

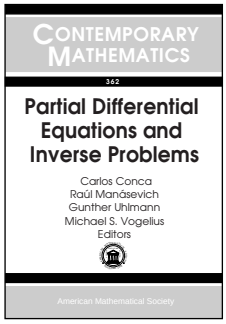
The book contains numerous exercises and a list of suggested additional reading. It is suitable for graduate students and researchers interested in ring theory.

Contents: *Projective modules:* Modules and homomorphisms; Projective modules; Completely reducible modules; Wedderburn rings; Artinian rings; Hereditary rings; Dedekind domains; Projective dimension; Tensor products; Local rings; *Polynomial rings:* Skew polynomial rings; Grothendieck groups; Graded rings and modules; Induced modules; Syzygy theorem; Patching theorem; Serre conjecture; Big projectives; Generic flatness; Nullstellensatz; *Injective modules:* Injective modules; Injective dimension; Essential extensions; Maximal ring of quotients; Classical ring of quotients; Goldie rings; Uniform dimension; Uniform injective modules; Reduced rank; Index.

AMS Chelsea Publishing

September 2004, 306 pages, Hardcover, ISBN 0-8218-3680-3, LC 2004054403, 2000 *Mathematics Subject Classification*: 16–01; 16–02, 19–02, **All AMS members $41**, List $45, Order code CHEL/348.HN

Differential Equations



Partial Differential Equations and Inverse Problems

Carlos Conca, Raúl Manásevich, Gunther Uhlmann, and **Michael S. Vogelius**, Editors

This proceedings volume is a collection of articles from the Pan-American Advanced Studies Institute on partial differential equations, nonlinear analysis and inverse problems held in Santiago (Chile).

Interactions among partial differential equations, nonlinear analysis, and inverse problems have produced remarkable developments over the last couple of decades. This volume contains survey articles reflecting the work of leading experts who presented minicourses at the event. Contributors include J. Busca, Y. Capdeboscq, M.S. Vogelius, F. A. Grünbaum, L. F. Matusevich, M. de Hoop, and P. Kuchment.

The volume is suitable for graduate students and researchers interested in partial differential equations and their applications in nonlinear analysis and inverse problems.

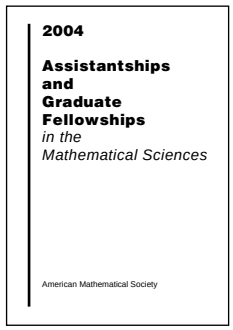
This item will also be of interest to those working in applications.

Contents: T. Aktosun, Inverse scattering on the line with incomplete scattering data; **M. S. Ashbaugh**, On universal inequalities for the low eigenvalues of the buckling problem; **J. Baras**, **C. Berenstein**, and **F. Gavilánez**, Continuous and discrete inverse conductivity problems; **R. D. Benguria** and **M. Loss**, Connection between the Lieb-Thirring conjecture for Schrödinger operators and an isoperimetric problem for ovals on the plane; **J. Busca**, An introduction to PDE methods in finance; **Y. Capdeboscq** and **M. S. Vogelius**, A review of some recent work on impedance imaging for inhomogeneities of low volume fraction; **F. A. C. C. Chalub** and **J. P. Zubelli**, Matrix bispectrality and Huygens' principle for Dirac operators; **A. J. Corcho** and **F. Linares**, Well-posedness for the Schrödinger-Debye equation; **A. Dall'Acqua** and **G. Sweers**, On domains for which the clamped plate system is positivity preserving; **M. Di Francesco** and **P. A. Markowich**, Entropy dissipation and Wasserstein metric methods for the viscous Burgers' equation: convergence to diffusive waves; **J. Dolbeault**, **D. Kinderlehrer**, and **M. Kowalczyk**, Remarks about the flashing rachet; **N. Ghoussoub** and **R. J. McCann**, A least action principle for steepest descent in a non-convex landscape; **F. A. Grünbaum** and **L. F. Matusevich**, A network tomography problem related to the hypercube; **A. Hassell** and **J. Wunsch**, On the structure of the Schrödinger propagator; **M. V. de Hoop**, The downward continuation approach to modeling and inverse scattering of seismic data in the Kirchhoff approximation; **M. Kowalczyk**, Approximate invariant manifold of the Allen-Cahn flow in two dimensions; **P. Kuchment**, On some spectral problems of mathematical physics; **M. Lassas**, **L. Päivärinta**, and **E. Saksman**, Inverse problem for a random potential; **R. Mazzeo**, Pseudodifferential analysis for the Laplacian on noncompact symmetric spaces; **G. A. Mendoza**, Boundary structure and cohomology of b-complex manifolds; **G. Nakamura**, **G. Uhlmann**, and **J.-N. Wang**, Unique continuation property for elliptic systems and crack determination in anisotropic elasticity; **M. del Pino**, **J. Dolbeault**, and **M. Musso**, Duality in sub-supercritical bubbling in the Brezis-Nirenberg problem near the critical exponent; **F. Reitich**, High-order domain variations in boundary value and free boundary problems; **A. S. Barreto**, Radiation fields and inverse scattering on asymptotically Euclidean manifolds; **C. Timofte** and **C. Conca**, Interactive oscillation sources in Signorini's type problems; **R. Weder**, Inverse scattering with time-periodic potentials; **R. Weikard**, A local Borg-Marchenko theorem for difference equations with complex coefficients.

Contemporary Mathematics, Volume 362

October 2004, 410 pages, Softcover, ISBN 0-8218-3448-7, LC 2004051901, 2000 *Mathematics Subject Classification*: 05C40, 35B60, 35B65, 35P25, 35P99, 35Q40, 35Q53, 35Q55, 35Q60, 35R30, 58J05, 78A48, 81Q10, 81U40, **All AMS members $79**, List $99, Order code CONM/362N

General and Interdisciplinary



Assistantships and Graduate Fellowships 2004

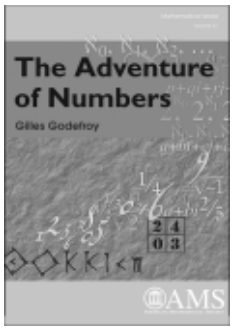
From a review of a previous edition:

This directory is a tool for undergraduate mathematics majors seeking information about graduate programs in mathematics. Although most of the information can be gleaned from the Internet, the usefulness of this directory for the prospective graduate student is the consistent format for comparing different mathematics graduate programs without the hype. Published annually, the information is up-to-date, which is more than can be said of some Websites. Support for graduate students in mathematics is a high priority of the American Mathematical Society, which also provides information for fellowships and grants they offer as well as support from other societies and foundations. The book is highly recommended for academic and public libraries.

—American Reference Books Annual

This valuable reference source brings together a wealth of information about resources available for graduate study in mathematical sciences departments in the U. S. and Canada.

November 2004, approximately 128 pages, Softcover, ISBN 0-8218-3619-6, **Individual member $18**, List $23, Order code ASST/2004N



The Adventure of Numbers

For Classroom Use

Gilles Godefroy, *Institut de Mathématiques de Jussieu, Paris, France, and Directeur de Recherches at the C.N.R.S., Paris, France*

Numbers are fascinating. The fascination begins in childhood, when we first learn to count, and continues as we learn arithmetic, algebra, geometry, and so on. Eventually, we find that numbers not only help us to measure the world, but also to understand it and, to some extent, to control it. In *The Adventure of Numbers*, Gilles Godefroy unfolds a great adventure of the mind by examining our expanding understanding of numbers throughout history.

The development of mathematics has been punctuated by a need to reconsider what we mean by "numbers". It is often during these times that major shifts occur, for example when the Pythagoreans discovered irrational numbers or when imaginary numbers were needed to solve the cubic. Each jump takes place in a context, where mathematics itself is forced to ponder fundamental questions, many of which led to famous controversies.

Godefroy's adventure starts in the very early days of mathematics in Mesopotamia and leads to the present day. The adventure does not end there. Important questions and controversies remain today that deal with consistency and complexity or with what constitutes a proof. And the future will hold even more questions.

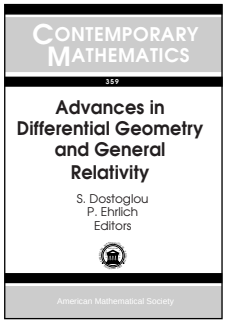
The author, Gilles Godefroy, is a member of the Institut de Mathématiques de Jussieu and Directeur de Recherches at the C.N.R.S. The book is suitable for independent study and supplementary reading and is recommended for undergraduates, graduate students, and researchers interested in the history of mathematics.

Contents: Hands, sticks, and stones; By the waters of Babylon; Let none but geometers enter here; Algebra and algorithms; A new world; "Eppur, si muove!"; The century of revolutions; "From the paradise that Cantor has created for us"...; The present perplexity; And now?; Number bases; The Fibonacci sequence; Polynomials; Quaternions; Axioms of set theory and arithmetic; Glossary; Bibliography.

Mathematical World, Volume 21

September 2004, 194 pages, Softcover, ISBN 0-8218-3304-9, LC 2004054547, 2000 *Mathematics Subject Classification*: 01A05, 11–03, **All AMS members $23**, List $29, Order code MAWRLD/21N

Geometry and Topology



Advances in Differential Geometry and General Relativity

S. Dostoglou, *University of Missouri, Columbia*, and **P. Ehrlich**, *University of Florida, Gainesville*, Editors

This volume consists of expanded versions of invited lectures given at The Beemfest: Advances in Differential Geometry and General Relativity (University of Missouri-Columbia) on the occasion of Professor John K. Beem's retirement. The articles address problems in differential geometry in general and in particular, global Lorentzian geometry, Finsler geometry, causal boundaries, Penrose's cosmic censorship hypothesis, the geometry of differential operators with variable coefficients on manifolds, and asymptotically de Sitter spacetimes satisfying Einstein's equations with positive cosmological constant.

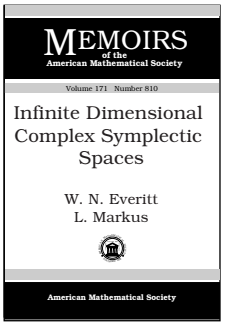
The book is suitable for graduate students and research mathematicians interested in differential geometry.

This item will also be of interest to those working in mathematical physics.

Contents: P. E. Ehrlich and **K. L. Easley**, A Beemian sampler: 1966–2002; **P. E. Parker**, Geometry of bicharacteristics; **L. Del Riego**, Making the right connection?; **A. Królak**, Cosmic censorship hypothesis; **S. G. Harris**, Boundaries on spacetimes: An outline; **G. J. Galloway**, Cosmological spacestimes with $\Lambda > 0$; **T. Dray**, General relativity and signature change.

Contemporary Mathematics, Volume 359

November 2004, 124 pages, Softcover, ISBN 0-8218-3539-4, LC 2004047672, 2000 *Mathematics Subject Classification*: 53–xx, 83–xx, 58–xx, **All AMS members $39**, List $49, Order code CONM/359N



Infinite Dimensional Complex Symplectic Spaces

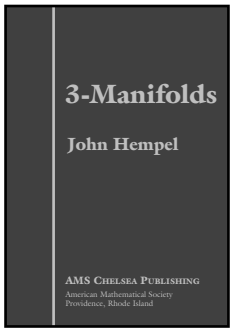
W. N. Everitt, *University of Birmingham, England*, and **L. Markus**, *University of Minnesota, Minneapolis*

This item will also be of interest to those working in differential equations.

Contents: Introduction: Motivation and Organization of results; Complex symplectic spaces: Fundamental concepts and definitions; Symplectic weak topology; Algebraic and arithmetic invariants: Hilbert structures; Applications to the theory of symmetric linear operators; Aftermath; Acknowledgements; Bibliography; Index.

Memoirs of the American Mathematical Society, Volume 171, Number 810

July 2004, 76 pages, Softcover, ISBN 0-8218-3545-9, LC 2004049176, 2000 *Mathematics Subject Classification*: 51A50, 46A03, 37K05; 46C20, 35J40, **Individual member $31**, List $51, Institutional member $41, Order code MEMO/171/810N



3-Manifolds

For Classroom Use

John Hempel, *Rice University, Houston, TX*

From a review of the original edition:

A careful and systematic development of the theory of the topology of 3-manifolds, focusing on the critical role of the fundamental group in determining the topological structure of a 3-manifold … self-contained … one can learn the subject from it … would be very appropriate as a text for an advanced graduate course or as a basis for a working seminar.

—***MathSciNet***

For many years, John Hempel's book has been a standard text on the topology of 3-manifolds. Even though the field has grown tremendously during that time, the book remains one of the best and most popular introductions to the subject.

The theme of this book is the role of the fundamental group in determining the topology of a given 3-manifold. The essential ideas and techniques are covered in the first part of the book: Heegaard splittings, connected sums, the loop and sphere theorems, incompressible surfaces, free groups, and so on. Along the way, many useful and insightful results are proved, usually in full detail. Later chapters address more advanced topics, including Waldhausen's theorem on a class of 3-manifolds that is completely determined by its fundamental group. The book concludes with a list of problems that were unsolved at the time of publication.

Hempel's book remains an ideal text to learn about the world of 3-manifolds. The prerequisites are few and are typical of a beginning graduate student. Exercises occur throughout the text.

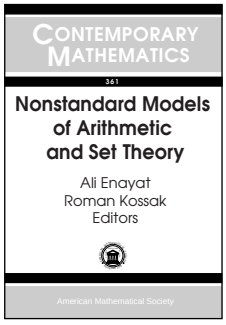
Other key books on low-dimensional topology available from the AMS are *Knots and Links*, *Lectures on Three-Manifold Topology*, and *The Knot Book*.

Contents: Preliminaries; Heegaard splittings; Connected sums; The loop and sphere theorems; Free groups; Incompressible surfaces; Kneser's conjecture on free products; Finitely generated subgroups; More on connected sums; Finite and abelian subgroups; I-bundles; Group extensions and fibrations; Seifert fibered spaces; Classification of P^2-irreducible, sufficiently large 3-manifolds; Some approaches to the Poincaré conjecture; Open problems; References; Index; Symbols and notation.

AMS Chelsea Publishing

November 2004, 195 pages, Hardcover, ISBN 0-8218-3695-1, LC 2004048971, 2000 *Mathematics Subject Classification*: 57N10, 57–01, **All AMS members $26**, List $29, Order code CHEL/349.HN

Logic and Foundations



Nonstandard Models of Arithmetic and Set Theory

Ali Enayat, *American University, Washington, DC*, and **Roman Kossak**, *City University of New York, NY*, Editors

This is the proceedings of the AMS special session on nonstandard models of arithmetic and set theory held at the Joint Mathematics Meetings in Baltimore (MD). The volume opens with an essay from Haim Gaifman that probes the concept of *non-standardness* in mathematics and provides a fascinating mix of historical and philosophical insights into the nature of nonstandard mathematical structures. In particular, Gaifman compares and contrasts the discovery of nonstandard models with other key mathematical innovations, such as the introduction of various number systems, the modern concept of function, and non-Euclidean geometries.

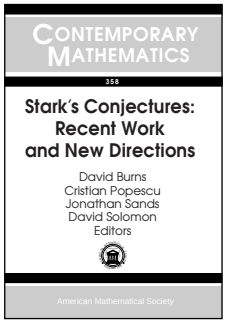
Other articles in the book present results related to nonstandard models in arithmetic and set theory, including a survey of known results on the Turing upper bounds of arithmetic sets and functions. The volume is suitable for graduate students and research mathematicians interested in logic, especially model theory.

Contents: H. Gaifman, Non-standard models in a broader perspective; **P. D'Aquino** and **J. F. Knight**, Coding in $I\Delta_0$; **A. Enayat**, Automorphisms, Mahlo cardinals, and NFU; **T. Forster**, AC fails in the natural analogues of V and L that model the stratified fragment of ZF; **H. M. Friedman**, Working with nonstandard models; **K. Hrbacek**, Internally iterated ultrapowers; **R. Jin**, On some questions of Hrbacek and Di Nasso; **A. M. McAllister**, Turing upper bounds of jump ideals and Scott sets; **J. H. Schmerl**, Diversity in substructures; **A. A. Togha**, Automorphisms of countable recursively saturated models of set theory.

Contemporary Mathematics, Volume 361

October 2004, 167 pages, Softcover, ISBN 0-8218-3535-1, LC 2004051986, 2000 *Mathematics Subject Classification*: 03C62, 03C20, 03H05, 03H15, 03D50, 26E30, 03C55, 03E25, 03E99, 03E35, **All AMS members $47**, List $59, Order code CONM/361N

Number Theory



Stark's Conjectures: Recent Work and New Directions

David Burns, *King's College, London, England*, **Cristian Popescu**, *University of California, San Diego*, **Jonathan Sands**, *University of Vermont, Burlington*, and **David Solomon**, *King's College, London, England*, Editors

Stark's conjectures on the behavior of L-functions were formulated in the 1970s. Since then, these conjectures and their generalizations have been actively investigated. This has led to significant progress in algebraic number theory.

The current volume, based on the conference held at Johns Hopkins University (Baltimore, MD), represents the state-of-the-art research in this area. The first four survey papers provide an introduction to a majority of the recent work related to Stark's conjectures. The remaining six contributions touch on some major themes currently under exploration in the area, such as non-abelian and p-adic aspects of the conjectures, abelian refinements, etc. Among others, some important contributors to the volume include Harold M. Stark, John Tate, and Barry Mazur.

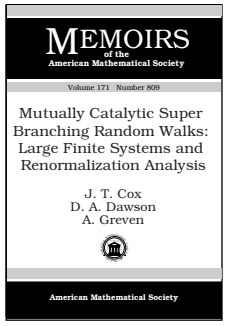
The book is suitable for graduate students and researchers interested in number theory.

Contents: C. D. Popescu, Rubin's integral refinement of the abelian Stark conjecture; **D. S. Dummit**, Computations related to Stark's conjecture; **C. Greither**, Arithmetic annihilators and Stark-type conjectures; **M. Flach**, The equivariant Tamagawa number conjecture: A survey; **J. W. Sands**, Popescu's conjecture in multi-quadratic extensions; **D. Solomon**, Abelian conjectures of Stark type in $\mathbb{Z}_p$-extensions of totally real fields; **H. M. Stark**, The derivative of p-adic Dirichlet series at s=0; **J. Tate**, Refining Gross's conjecture on the values of abelian L-functions; **D. R. Hayes**, Stickleberger functions for non-abelian Galois extensions of global fields; **B. Mazur** and **K. Rubin**, Introduction to Kolyvagin systems.

Contemporary Mathematics, Volume 358

October 2004, 221 pages, Softcover, ISBN 0-8218-3480-0, LC 2004049692, 2000 *Mathematics Subject Classification*: 11G40, 11R23, 11R27, 11R29, 11R33, 11R42, 11S40, 11Y40, **All AMS members $55**, List $69, Order code CONM/358N

Probability



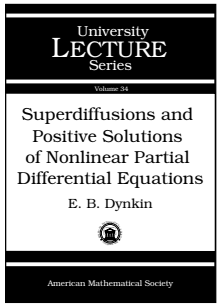
Mutually Catalytic Super Branching Random Walks: Large Finite Systems and Renormalization Analysis

J. T. Cox, *Syracuse University, NY*, **D. A. Dawson**, *Carleton University, Ottawa, ON, Canada*, and **A. Greven**, *University of Erlangen-Nurnberg, Germany*

Contents: Introduction; Results: Longtime behavior of large finite systems; Results: Renormalization analysis and corresponding basic limiting dynamics; Results: Application of renormalization to large scale behavior; Preparation: Key technical tools; Finite system scheme (Proof of Theorems 1, 2); Multiple space-time scale analysis (Proof of Theorem 3, 5); Analysis of the interaction chain (Proof of Theorem 4, 6–8.

Memoirs of the American Mathematical Society, Volume 171, Number 809

July 2004, 97 pages, Softcover, ISBN 0-8218-3542-4, LC 2004049175, 2000 *Mathematics Subject Classification*: 60K35, 60G57, **Individual member $32**, List $54, Institutional member $43, Order code MEMO/171/809N



Superdiffusions and Positive Solutions of Nonlinear Partial Differential Equations

E. B. Dynkin, *Cornell University, Ithaca, New York*

This book is devoted to the applications of probability theory to the theory of nonlinear partial differential equations. More precisely, it is shown that all positive solutions for a class of nonlinear elliptic equations in a domain are described in terms of their traces on the boundary of the domain. The main probabilistic tool is the theory of superdiffusions, which describes a random evolution of a cloud of particles. A substantial enhancement of this theory is presented that will be of interest to anyone who works on applications of probabilistic methods to mathematical analysis.

The book is suitable for graduate students and research mathematicians interested in probability theory and its applications to differential equations.

Also of interest by this author is *Diffusions, Superdiffusions and Partial Differential Equations* in the AMS series, Colloquium Publications.

This item will also be of interest to those working in differential equations.

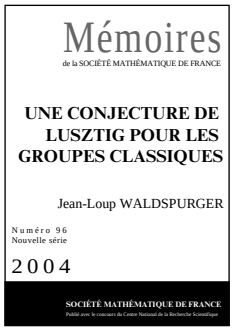
Contents: Introduction; Analytic approach; Probabilistic approach; $\mathbb{N}$-measures; Moments and absolute continuity properties of superdiffusions; Poisson capacities; Basic inequality; Solutions w_Γ are σ-moderate; All solutions are σ-moderate; Appendix A: An elementary property of the Brownian motion; Appendix B: Relations between Poisson and Bessel capacities; References; Subject index; Notation index.

University Lecture Series, Volume 34

November 2004, 120 pages, Softcover, ISBN 0-8218-3682-X, LC 2004055059, 2000 *Mathematics Subject Classification*: 60–02; 31B05, 35J60, 60J60, **All AMS members $23**, List $29, Order code ULECT/34N

New AMS-Distributed Publications

Algebra and Algebraic Geometry



Une conjecture de Lusztig pour les groupes classiques

Jean-Loup Waldspurger, *Institute Mathématique de Jussieu, Paris, France*

In this book, *A Conjecture of Lusztig for Classical Groups*, the author proves a conjecture of Lusztig connecting characters of irreducible representations with characteristic functions of character-sheaves for a classical group defined over a finite field of sufficiently large characteristic. Those functions are precisely normalized in the proof. The result generalizes Shoji's results to all classical groups. In particular, the even orthogonal group is considered, which is neither connected nor with connected center.

This item will also be of interest to those working in number theory.

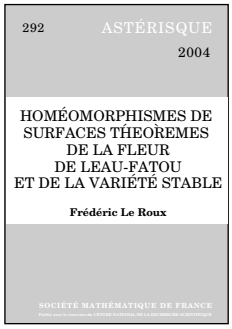
A publication of the Société Mathématique de France, Marseilles (SMF), distributed by the AMS in the U.S., Canada, and Mexico. Orders from other countries should be sent to the SMF. Members of the SMF receive a 30% discount from list.

Contents: Introduction; Notations; Symboles; Faisceaux-caractères; Représentations quadratiques-unipotentes; Les théorèmes; Détermination des faisceaux-caractères quadratiques-unipotents; Valeurs des fonctions traces de faisceaux-caractères; Formules d'induction; Paramétrage de Lusztig; Quelques calculs de traces; Commutation à l'induction de Deligne-Lusztig; Fin de la preuve; Le cas du groupe symplectique; Bibliographie.

Mémoires de la Société Mathématique de France, Number 96

June 2004, 166 pages, Softcover, ISBN 2-85629-148-1, 2000 *Mathematics Subject Classification*: 11E57, 20C33, **Individual member $47**, List $52, Order code SMFMEM/96N

Differential Equations



Homéomorphismes de surfaces, théorémes de la fleur de Leau-Fatou et de la variété stable

Frédéric Le Roux, *Université Paris Sud, Orsay, France*

This book, *Dynamics of Surface Homeomorphisms, Topological Versions of Leau-Fatou Flower Theorem and Stable Manifold Theorem*, shows that the study of the dynamics of a surface homeomorphism in the neighborhood of an isolated fixed point leads to the following results: If the fixed point index is greater than 1, a family of attractive and repulsive petals is constructed, generalizing the Leau-Fatou flower theorem in complex dynamics. If the index is less than 1, one gets a family of stable and unstable branches, generalizing the stable manifold theorem in differentiable hyperbolic dynamics.

This item will also be of interest to those working 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; Présentation des résultats de dynamique locale; Intermède : du local au global; Dynamique globale: énoncé et résultats préliminaires; Preuve du théorème principal de dynamique globale; Applications en dynamique locale; Appendice: Théorème de Schoenflies-Homma et variantes; Bibliographie; Index.

Astérisque, Number 292

June 2004, 120 pages, Softcover, ISBN 2-85629-153-8, 2000 *Mathematics Subject Classification*: 37E30, 37C25, **Individual member $23**, List $26, Order code AST/292N