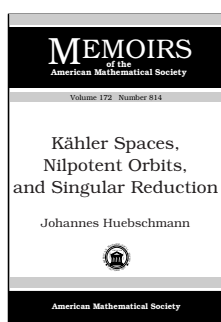# New Publications Offered by the AMS

Algebra and Algebraic Geometry

### Kähler Spaces, Nilpotent Orbits, and Singular Reduction

Johannes Huebschmann, *Université des Sciences et Technologies de Lille, Villeneuve, France*

This item will also be of interest to those working in geometry and topology.

Contents: Introduction; Poisson algebras and Lie-Rinehart algebras; Stratified polarized spaces; The closure of a holomorphic nilpotent orbit; Reduction and stratified Kähler spaces; Associated representations and singular reduction; Associated representations for the remaining classical case; Hermitian Jordan triple systems and pre-homogeneous spaces; The exceptional cases; Contraction of semisimple holomorphic orbits; Projectivization and exotic projective varieties; Comparison with other notions of Kähler space with singularities; References.

Memoirs of the American Mathematical Society, Volume 172, Number 814

October 2004, 96 pages, Softcover, ISBN 0-8218-3572-6, LC 2004054529, 2000 *Mathematics Subject Classification*: 53D20; 14L24, 14L30, 17B63, 17B65, 17B66, 17B81, 17C36, 17C37, 17C40, 17C70, 17C90, 32C20, 32M15, 32Q15, 32S05, 32S60, 53C30, 53D17, 53D30, 53D50, 81S10, **Individual member $32**, List $54, Institutional member $43, Order code MEMO/172/814N
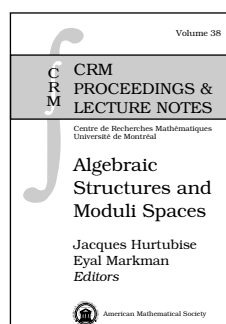
Algebraic Structures and Moduli Spaces

CRM Workshop, July 14–20, 2003, Montréal, Canada

Jacques Hurtubise, *McGill University, Montréal, QC, Canada, and Centre de Recherches Mathématiques, Montréal, QC, Canada*, and **Eyal Markman**, *University of Massachusetts, Amherst*, Editors

This book contains recent and exciting developments on the structure of moduli spaces, with an emphasis on the algebraic structures that underlie this structure. Topics covered include Hilbert schemes of points, moduli of instantons, coherent sheaves and their derived categories, moduli of flat connections, Hodge structures, and the topology of affine varieties.

Two beautiful series of lectures are a particularly fine feature of the book. One is an introductory series by Manfred Lehn on the topology and geometry of Hilbert schemes of points on surfaces, and the other, by Hiraku Nakajima and Kōta Yoshioka, explains their recent work on the moduli space of instantons over $\mathbb{R}^4$.

The material is suitable for graduate students and researchers interested in moduli spaces in algebraic geometry, topology, and mathematical physics.

*This item will also be of interest to those working in geometry and topology and mathematical physics.*

Contents: **M. Lehn**, Lectures on Hilbert schemes; **H. Nakajima** and **K. Yoshioka**, Lectures on instanton counting; **C. Bartocci** and **M. Jardim**, Hyper-Kähler Nahm transforms; **A. Braverman**, Instanton counting via affine Lie algebras. I. Equivariant J-functions of (affine) flag manifolds and Whittaker vectors; **M. A. A. de Cataldo** and **L. Migliorini**, The Gysin map is compatible with mixed Hodge structures; **N.-K. Ho** and **L. C. Jeffrey**, Representations of fundamental groups of nonorientable 2-manifolds; **Y. Namikawa**, Mukai flops and derived categories. II; **S. Hosono, B. H. Lian, K. Oguiso**, and **S.-T. Yau**, Fourier-Mukai number of a K3 surface; **J. Sawon**, Derived equivalence of holomorphic symplectic manifolds; **M. Roth** and **R. Vakil**, The affine stratification number and the

moduli space of curves; **M. Verbitsky**, Coherent sheaves on generic compact tori; **W.-P. Li**, **Z. Qin**, and **W. Wang**, The cohomology rings of Hilbert schemes via Jack polynomials.

CRM Proceedings & Lecture Notes, Volume 38

October 2004, 258 pages, Softcover, ISBN 0-8218-3568-8, LC 2004057088, 2000 *Mathematics Subject Classification*: 14Dxx, 14Cxx, **All AMS members $63**, List $79, Order code CRMP/38N

Analysis
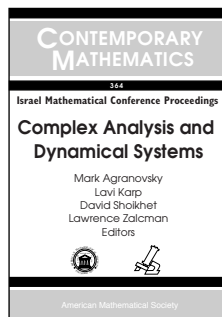
Complex Analysis and Dynamical Systems

Mark Agranovsky, *Bar-Ilan University, Ramat-Gan, Israel*, **Lavi Karp** and **David Shoikhet**, *ORT Braude College, Karmiel, Israel*, and **Lawrence Zalcman**, *Bar-Ilan University, Ramat-Gan, Israel*, Editors

This book contains contributions from the participants of an International Conference on Complex Analysis and Dynamical Systems.

The papers collected here are devoted to various topics in complex analysis and dynamical systems, ranging from properties of holomorphic mappings to attractors in hyperbolic spaces. Overall, these selections provide an overview of activity in analysis at the outset of the twenty-first century. The book is suitable for graduate students and researchers in complex analysis and related problems of dynamics.

With this volume, the Israel Mathematical Conference Proceedings are now published as a subseries of the AMS Contemporary Mathematics series.

Contents: **L. Aizenberg**, Remarks on the "asymptotic maximum principle"; **C. Beneteau** and **B. Korenblum**, Some coefficient estimates for H^p functions; **R. Brooks**, A statistical model of Riemann surfaces; **M. Budzyńska**, Holomorphic retracts in domains with the locally uniformly linearly convex Kobayashi distance; **M. Budzyńska** and **T. Kuczumow**, Common fixed points of holomorphic mappings and retracts of B_H^∞; **M. Elin**, **A. Goldvard**, **S. Reich**, and **D. Shoikhet**, Dynamics of spirallike functions; **L. A. Harris**, Invertibility preserving linear maps of Banach algebras; **J. Hilgert** and **D. Mayer**, The dynamical zeta function and transfer operators for the Kac-Baker model; **V. A. Khatskevich**, **V. A. Senderov**, and **V. S. Shulman**, On operator matrices generating linear fractional maps of operator balls; **T. Krainer** and **B.-W. Schulze**, Long-time asymptotics with geometric singularities in the spatial variables; **S. L. Krushkal**, Grunsky inequalities of higher rank with applications to complex geometry and function theory; **M. Lanza de Cristoforis**, Asymptotic behaviour of the conformal representation of a Jordan domain with a small hole, and relative capacity; **D. Lenz**, Singular continuous spectrum for certain quasicrystal Schrödinger operators; **E. Malinnikova**, Measures orthogonal to the gradients of harmonic functions; **O. Martio**, **V. Ryazanov**, **U. Srebro**, and **E. Yakubov**, Q-homeomorphisms; **B. Paneah**, Dynamic

methods in the general theory of Cauchy type functional equations; **V. S. Rabinovich**, Exponential estimates for eigenfunctions of Schrödinger operators with rapidly increasing and discontinuous potentials; **S. Reich** and **A. J. Zaslavski**, A porosity result for attracting mappings in hyperbolic spaces; **B. Schneider** and **M. Shapiro**, Some properties of the quaternionic Cauchy-type integral for a piece-wise Liapunov surface of integration.

Contemporary Mathematics, Volume 364

December 2004, 260 pages, Softcover, ISBN 0-8218-3686-2, LC 2004052777, 2000 *Mathematics Subject Classification*: 30–XX, 32–XX, 35–XX, 46–XX, 47–XX, **All AMS members $63**, List $79, Order code CONM/364N

Functional Analysis

For Classroom Use
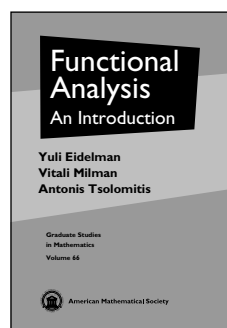
An Introduction

Yuli Eidelman and **Vitali Milman**, *Tel Aviv University, Israel*, and **Antonis Tsolomitis**, *University of the Aegean, Samos, Greece*

This textbook provides an introduction to the methods and language of functional analysis, including Hilbert spaces, Fredholm theory for compact operators, and spectral theory of self-adjoint operators. It also presents the basic theorems and methods of abstract functional analysis and a few applications of these methods to Banach algebras and the theory of unbounded self-adjoint operators.

The text corresponds to material for two semester courses (Part I and Part II, respectively) and is essentially self-contained. Prerequisites for the first part are minimal amounts of linear algebra and calculus. For the second part, some knowledge of topology and measure theory is recommended. Each of the 11 chapters is followed by numerous exercises, with solutions given at the end of the book.

The amount of mathematics presented in the book can well be absorbed in a year's study and will provide a sound basis for future reading. It is suitable for graduate students and researchers interested in operator theory and functional analysis.

Contents: *Hilbert spaces and basic operator theory:* Linear spaces; normed spaces; first examples; Hilbert spaces; The dual space; Bounded linear operators; Spectrum. Fredholm theory of compact operators; Self-adjoint operators; Functions of operators; spectral decomposition; *Basics of functional analysis:* Spectral theory of unitary operators; The fundamental theorems and the basic methods; Banach algebras; Unbounded self-adjoint and symmetric operators in H; Solutions to exercises; Bibliography; Symbols index; Subject index.

Graduate Studies in Mathematics, Volume 66

December 2004, approximately 344 pages, Hardcover, ISBN 0-8218-3646-3, LC 2004057393, 2000 *Mathematics Subject Classification*: 46–01, 47–01; 46Axx, 46Bxx, 46Cxx, 46Hxx, 47Axx, 47Bxx, **All AMS members $44**, List $55, Order code GSM/66N
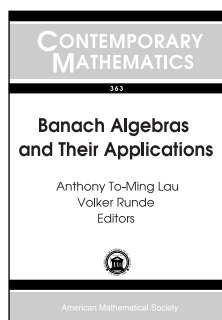
Banach Algebras and Their Applications

Anthony To-Ming Lau and **Volker Runde**, *University of Alberta, Edmonton, AB, Canada*, Editors

This proceedings volume is from the international conference on Banach Algebras and Their Applications held at the University of Alberta (Edmonton). It contains a collection of refereed research papers and high-level expository articles that offer a panorama of Banach algebra theory and its manifold applications.

Topics in the book range from *K*-theory to abstract harmonic analysis to operator theory. It is suitable for graduate students and researchers interested in Banach algebras.

Contents: M. Amini and A. Medghalchi, Fourier algebras on tensor hypergroups; O. Yu. Aristov, Amenability and compact type for Hopf-von Neumann algebras from the homological point of view; A. Baklouti, N. B. Salah, and K. Smaoui, Some uncertainty principles on nilpotent Lie groups; D. P. Blecher, Are operator algebras Banach algebras?; C.-H. Chu, Jordan Banach algebras in harmonic analysis; J. Esterle, Zero-one and zero-two laws for the behavior of semigroups near the origin; J. F. Feinstein and H. Kamowitz, Compact homomorphisms between Dales-Davie algebras; B. Forrest, Completely bounded multipliers and ideals in $A(G)$ vanishing on closed subgroups; F. Gourdeau, Z. A. Lykova, and M. C. White, The simplicial cohomology of $L^1(\mathbb{R}^k_+)$; S. A. Grigoryan and T. V. Tonev, Shift-invariant algebras on groups; N. Grønbæk, Self-induced Banach algebras; A. Ya. Helemskii, Some aspects of topological homology since 1995: a survey; E. Kaniuth and A. T.-M. Lau, Fourier algebras and amenability; W. C. Lang, Refinement equations and generalized multiresolution analyses for hypergroups; R. Lasser, Almost periodic sequences with respect to orthogonal polynomials; N. J. Laustsen, K-theory for Banach *-algebras; V. Losert, Separation property, Mautner phenomenon, and neutral subgroups; J. Mashreghi and T. Ransford, Using entire functions to analyse power growth; M. Mathieu, Another automatic boundedness technique; R. Meyer, Bornological versus topological analysis in metrizable spaces; T. L. Miller, V. G. Miller, and M. M. Neumann, Banach algebras, local spectral theory, and extensions of operators; W. J. Ricker, Banach algebras of p-multiplier operators for the circle group; E. R. Schulz and K. F. Taylor, Projections in L^1-algebras and tight frames; Yu. V. Selivanov, Classes of Banach algebras of global dimension infinity; N. Spronk, Representations of multiplier algebras in spaces of completely bounded maps.

Contemporary Mathematics, Volume 363

December 2004, 343 pages, Softcover, ISBN 0-8218-3471-1, LC 2004052924, 2000 *Mathematics Subject Classification*: 46–06; 22Exx, 30Dxx, 43–XX, 43A62, 46Hxx, 46Jxx, 46J10, 46L51, 46L80, 46Mxx, 47A11, 47Dxx, 47L25, 47L50, **All AMS members $71**, List $89, Order code CONM/363N

Geometry and Topology
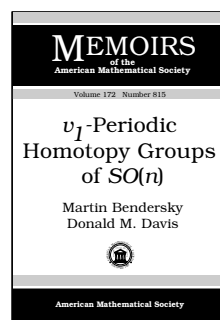
## ν_1-Periodic Homotopy Groups of $SO(n)$

Martin Bendersky, *Hunter College, City University of New York*, and **Donald M. Davis**, *Lehigh University*

Contents: Introduction; The BTSS of BSpin(n) and the CTP; Listing of results; The 1-line of Spin($2n$); Eta towers; d_3 on eta towers; Fine tuning; Combinatorics; Comparison with J-homology approach; Proof of fibration theorem; A small resolution for computing ext$_\mathcal{A}$; Bibliography.

Memoirs of the American Mathematical Society, Volume 172, Number 815

October 2004, 90 pages, Softcover, ISBN 0-8218-3589-0, LC 2004054530, 2000 *Mathematics Subject Classification*: 55Q52, 55T15, 57T20, **Individual member $32**, List $54, Institutional member $43, Order code MEMO/172/815N
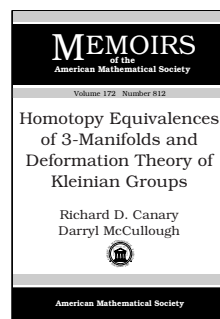
Homotopy Equivalences of 3-Manifolds and Deformation Theory of Kleinian Groups

Richard D. Canary, *University of Michigan, Ann Arbor,* and **Darryl McCullough**, *University of Oklahoma, Norman*

Contents: Introduction; Johannson's characteristic submanifold theory; Relative compression bodies and cores; Homotopy types; Pared 3-manifolds; Small 3-manifolds; Geometrically finite hyperbolic 3-manifolds; Statements of main theorems; The case when there is a compressible free side; The case when the boundary pattern is useful; Dehn flips; Finite index realization for reducible 3-manifolds; Epilogue; Bibliography; Index.

Memoirs of the American Mathematical Society, Volume 172, Number 812

October 2004, 218 pages, Softcover, ISBN 0-8218-3549-1, LC 2004054528, 2000 *Mathematics Subject Classification*: 57M99; 20F34, 30F40, 57M50, **Individual member $41**, List $68, Institutional member $54, Order code MEMO/172/812N
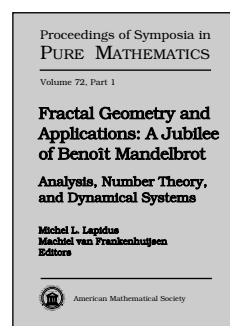
Fractal Geometry and Applications: A Jubilee of Benoît Mandelbrot

Michel L. Lapidus, *University of California, Riverside*, and **Machiel van Frankenhuijsen**, *Utah Valley State College, Orem*, Editors

This volume offers an excellent selection of cutting-edge articles about fractal geometry, covering the great breadth of mathematics and related areas touched by this subject. Included are rich survey articles and fine expository papers. The high-quality contributions to the volume by well-known researchers—including two articles by Mandelbrot—provide a solid cross-section of recent research representing the richness and variety of contemporary advances in and around fractal geometry.

In demonstrating the vitality and diversity of the field, this book will motivate further investigation into the many open problems and inspire future research directions. It is suitable for graduate students and researchers interested in fractal geometry and its applications.

This is a two-part volume. *Part 1* covers analysis, number theory, and dynamical systems; *Part 2*, multifractals, probability and statistical mechanics, and applications.

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

Contents: *Part 1:* **M. L. Lapidus**, Fractal geometry and applications–An introduction to this volume; **J. Barral** and **S. Jaffard**, Cherche Livre... et plus si affinité/Looking for a book...and more, if affinity; **M. Berry**, Benefiting from fractals; **M.-O. Coppens**, Benoit Mandelbrot, wizard of science; **R. L. Devaney**, Mandelbrot's vision for mathematics; **M. M. Dodson**, Benoit Mandelbrot and York; **B. Duplantier**, Nul n'entre ici s'il n'est géomètre/Let no one ignorant of geometry enter here; **M. L. Frame**, A decade of working with a maverick; **M. Frantz**, Breakfast with Mandelbrot; **J.-P. Kahane**, Old memories; **D. B. Mumford**, My encounters with Benoit Mandelbrot; **L. Nottale**, Fractal geometry and the foundations of physics; **B. Sapoval**, Is randomness partially tamed by fractals?; **J. E. Taylor**, On knowing Benoit Mandelbrot; *Analysis:* **M. M. France**, Reflections, ripples and fractals; **M. Frantz**, Lacunarity, Minkowski content, and self-similar sets in $\mathbb{R}$; **F. Morgan**, Fractals and geometric measure theory: Friends and foes; **H. Furstenberg** and **Y. Katznelson**, Eigenmeasures, equidistribution, and the multiplicity of β-expansions; **A. Kameyama**, Distances on topological self-similar sets; **A. Teplyaev**, Energy and laplacian on the Sierpiński gasket; **C. Sabot**, Electrical networks, symplectic reductions, and application to the renormalization map of self-similar lattices; **B. Solomyak**, Notes on Bernoulli convolutions; *Number theory:* **T. Hilberdink**, Some connections between Bernoulli convolutions and analytic number theory; **S. Jaffard**, On Davenport expansions; **M. M. Dodson** and **S. Kristensen**, Hausdorff

dimension and diophantine approximation; **M. L. Lapidus** and **M. van Frankenhuijsen**, Fractality, self-similarity and complex dimensions; *Dynamical systems:* **B. Kahng**, The invariant fractals of symplectic piecewise affine elliptic dynamics; **S. Crovisier**, Almost sure rotation number of circle endomorphisms; **V. Baladi**, Kneading determinants and transfer operators in higher dimensions; **V. Afraimovich**, **L. Ramírez**, and **E. Ugalde**, The spectrum of dimensions for Poincaré recurrences for nonuniformly hyperbolic geometric constructions; **M. Comerford**, A survey of results in random iteration; **D. Schleicher**, On fibers and local connectivity of Mandelbrot and multibrot sets; *Part 2. Multifractals:* **J. Barral** and **B. B. Mandelbrot**, Introduction to infinite products of independent random functions (Random multiplicative multifractal measures, part I); **J. Barral** and **B. B. Mandelbrot**, Non-degeneracy, moments, dimension, and multifractal analysis for random multiplicative measures (Random multiplicative multifractal measures, part II); **J. Barral**, Techniques for the study of infinite products of independent random functions (Random multiplicative multifractal measures, part III); **S. P. Jaffard**, Wavelet techniques in multifractal analysis; **J. L. Véhel** and **S. Seuret**, The 2-microlocal formalism; **J. Peyrière**, A vectorial multifractal formalism; *Probability and statistical mechanics:* **B. M. Hambly** and **T. Kumagai**, Heat kernel estimates for symmetric random walks on a class of fractal graphs and stability under rough isometries; **Y. Xiao**, Random fractals and Markov processes; **G. F. Lawler**, **O. Schramm**, and **W. Werner**, On the scaling limit of planar self-avoiding walk; **B. Duplantier**, Conformal fractal geometry & boundary quantum gravity; *Applications:* **A. Desolneux**, **B. Sapoval**, and **A. Baldassarri**, Self-organized percolation power laws with and without fractal geometry in the etching of random solids; **M.-O. Coppens**, Nature inspired chemical engineering–Learning from the fractal geometry of nature in sustainable chemical engineering; **F. K. Musgrave**, Fractal forgeries of nature.
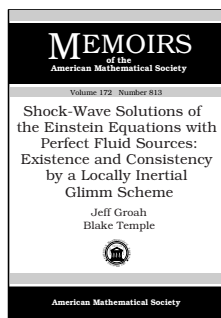
Mathematical Physics

Shock-Wave Solutions of the Einstein Equations with Perfect Fluid Sources: Existence and Consistency by a Locally Inertial Glimm Scheme

Jeff Groah, *California State University at Monterey Bay, Seaside,* and **Blake Temple**, *University of California, Davis*

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

Contents: Introduction; Preliminaries; The fractional step scheme; The Riemann problem step; The ODE step; Estimates for the ODE step; Analysis of the approximate solutions; The elimination of assumptions; Convergence.

Memoirs of the American Mathematical Society, Volume 172, Number 813

October 2004, 84 pages, Softcover, ISBN 0-8218-3553-X, LC 2004054527, 2000 *Mathematics Subject Classification*: 35L65, 35L67, 83C05, **Individual member $31**, List $51, Institutional member $41, Order code MEMO/172/813N

Probability
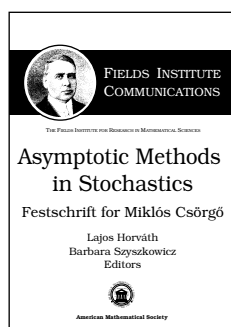
Asymptotic Methods in Stochastics
Festschrift for Miklós Csörgő

Lajos Horváth, *University of Utah, Salt Lake City,* and **Barbara Szyszkowicz**, *Carleton University, Ottawa, ON, Canada*, Editors

This volume, honoring over forty years of Miklós Csörgő's work in probability and statistics, reflects the state of current research. It offers a comprehensive collection of surveys introducing new results with complete proofs and expository papers giving an historic overview.

Contributions were made by an international cast of experts. The book covers the following topics: path properties of stochastic processes, probability theory with applications, complete convergence of renewal counting processes and bootstrap means, weak convergence of random size sums, almost sure stability of weighted maxima, procedures for detecting changes in statistical models, statistical inference via conditional quantiles, cumulative sums, multinomial samples,

empirical processes, applications to economics, and self-normalized partial sums processes. The section, "Applications to Economics", deals primarily with applications of stochastics to financial time series models.

The book is suitable for graduate students and researchers interested in probability theory, stochastic processes, mathematical statistics, and applications of these mathematical/statistical sciences.

Contents: *Path properties of stochastic processes:* **E. Csáki**, **A. Földes**, and **Z. Shi**, Our joint work with Miklós Csörgő; **D. Khoshnevisan**, Brownian sheet and quasi-sure analysis; **G. Peccati** and **M. Yor**, Hardy's inequality in $L^2([0,1])$ and principal values of Brownian local times; **G. Peccati** and **M. Yor**, Four limit theorems for quadratic functionals of Brownian motion and Brownian bridge; **P. Révész**, Tell me the values of a Wiener at integers, I tell you its local time; *Probability theory with applications:* **R. J. Bhansali**, **M. P. Holland**, and **P. S. Kokoszka**, Chaotic maps with slowly decaying correlations and intermittency; **Y. Davydov** and **V. Paulauskas**, Recent results on p-stable convex compact sets with applications; **Y. Davydov** and **R. Zitikis**, Convex rearrangements of random elements; **D. A. Dawson**, **L. G. Gorostiza**, and **A. Wakolbinger**, Hierarchical random walks; **K. A. Ross** and **Q.-M. Shao**, On Helgason's number and Khintchine's inequality; *Complete convergence of renewal counting processes and bootstrap means:* **A. Gut** and **J. Steinebach**, Convergence rates and precise asymptotics for renewal counting processes and some first passage times; **S. Csörgő**, On the complete convergence of bootstrap means; *Weak convergence of random size sums, almost sure stability of weighted maxima:* **I. Ćwiklińska** and **Z. Rychlik**, Weak convergence of random sums and maximum random sums under nonrandom norming; **R. J. Tomkins**, Criteria for the almost sure stability of weighted maxima of bounded i.i.d. random variables; *Procedures for detecting changes in statistical models:* **M. Hušková**, Permutation principle and bootstrap in change point analysis; **E.-E. A. A. Aly**, Change point detection based on L-statistics; **E. Atenafu** and **E. Gombay**, Sequential tests for change in the parameters of nested random effects model; **M. Orasch**, Using U-statistics based processes to detect multiple change-points; *Statistical inference via conditional quantiles, cumulative sums, multinomial samples, and empirical processes:* **E. Parzen**, Statistical methods learning and conditional quantiles; **M. D. Burke**, Testing regression models: A strong martingale approach; **A. R. Dabrowski** and **H. Dehling**, Conditional distribution of the H-coefficient in nonparametric unfolding models; **K. Ghoudi** and **B. Rémillard**, Empirical processes based on pseudo-observations II: The multivariate case; *Applications to economics:* **I. Berkes**, **L. Horváth**, and **P. Kokoszka**, Probabilistic and statistical properties of GARCH processes; **R. Kulperger**, Stochastic finance: Discrete time processes and risk neutral pricing; **D. L. McLeish**, Estimating the correlation of processes using extreme values; **H. Yu**, Analyzing residual processes of (G)ARCH time series models; *Self-normalized partial sums processes:* **M. Csörgő**, **B. Szyszkowicz**, and **Q. Wang**, On weighted approximations and strong limit theorems for self-normalized partial sums processes; **Q. Wang**, On Darling-Erdős type theorems for self-normalized sums.

Fields Institute Communications, Volume 44

December 2004, 530 pages, Hardcover, ISBN 0-8218-3561-0, LC 2004046445, 2000 *Mathematics Subject Classification*: 60–02, 62–02, 60F15, 60F17, 60G15, 60G17, 60G50, 60J55, 60J65, 60K37, 62G30, 62M10, **All AMS members $103**, List $129, Order code FIC/44N

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Annals de la faculté des sciences de Toulouse mathématiques

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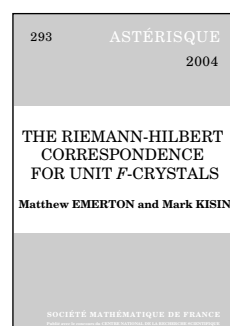
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www.ams.org/bookstore

New AMS-Distributed Publications

Algebra and Algebraic Geometry

The Riemann-Hilbert Correspondence for Unit F-crystals

Matthew Emerton and **Mark Kisin**, *Northwestern University, Evanston, IL*

Let $\mathbb{F}_q$ denote the finite field of order q (a power of a prime p), let X be a smooth scheme over a field k containing $\mathbb{F}_q$, and let Λ be a finite $\mathbb{F}_q$-algebra. We study the relationship between constructible Λ-sheaves on the étale site of X, and a certain class of quasi-coherent $\mathcal{O}_X \otimes_{\mathbb{F}_q} \Lambda$-modules equipped with a "unit" Frobenius structure. The authors show that the two corresponding derived categories are anti-equivalent as triangulated categories, and that this anti-equivalence is compatible with direct and inverse images, tensor products, and certain other operations.

They also obtain analogous results relating complexes of constructible $\mathbb{Z}/p^n\mathbb{Z}$-sheaves on smooth $W_n(k)$-schemes, and complexes of Berthelot's arithmetic $\mathcal{D}$-modules, equipped with a unit Frobenius.

The volume is suitable for graduate students and researchers interested in algebra and algebraic geometry.

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: General introduction; Introduction to §§1–12: $\mathcal{O}_{F,X}$-modules; Notation and conventions; $\mathcal{O}_{Fr}^\Lambda$-modules; Pull-backs of $\mathcal{O}_{Fr}^\Lambda$-modules; Push-forwards of $\mathcal{O}_{Fr}^\Lambda$-modules; Relations between f_+ and $f^!$; Unit $\mathcal{O}_{Fr}^\Lambda$-modules; Locally finitely generated unit $\mathcal{O}_{Fr}^\Lambda$-modules; $\mathcal{O}_{Fr}^\Lambda$-modules on the étale site; Λ-sheaves on the étale site; The functor Sol$_{\acute{e}t}$; The functor M$_{\acute{e}t}$; The Riemann-Hilbert correspondence for unit $\mathcal{O}_{F,X}$-modules; L-Functions for unit F^r-modules; Introduction to §§13–17: $\mathcal{D}_{F,X}$-modules; $\mathcal{D}_{F,X}^{(u)}$-modules; Direct and inverse images for $\mathcal{D}_{F,X}^{(u)}$-modules; Unit $\mathcal{D}_{F,X}$-modules; The Riemann-Hilbert correspondence for unit $\mathcal{D}_{F,X}$-modules; An equivalence of derived categories; Appendix A: Duality and the Cartier operator; Appendix B: Homological algebra; Bibliography.

Astérisque, Number 293

July 2004, 257 pages, Softcover, ISBN 2-85629-154-6, 2000 *Mathematics Subject Classification*: 14F30; 14F10, 14F20, 13N10, **Individual member $74**, List $82, Order code AST/293N