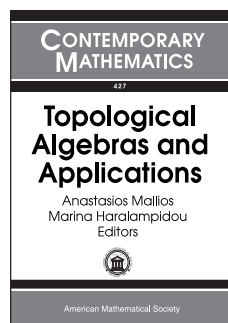


New Publications Offered by the AMS

Analysis



Topological Algebras and Applications

Anastasios Mallios and Marina Haralampidou, *University of Athens, Greece*, Editors

The Fifth International Conference on Topological Algebras and Applications was held in Athens, Greece, from June 27th to July 1st of 2005. The main topic of the conference was general theory of

topological algebras and its various applications, with emphasis on the “non-normed” case. In addition to the study of the internal structure of non-normed, and even non-locally convex topological algebras, there are applications to other branches of mathematics, such as differential geometry of smooth manifolds, and mathematical physics, such as quantum relativity and quantum cosmology. Operator theory of unbounded operators and related non-normed topological algebras are intensively studied here. Other topics presented in this volume are topological homological algebra, topological algebraic geometry, sheaf theory and K -theory.

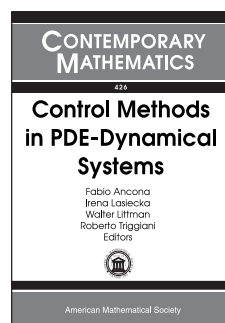
Contents: Z. Abdelali and M. Chidami, Topologisation et multiplication dans certaines algèbres; M. Abel, On Serre-Swan-Mallios theorem; M. Abel, Topological algebras with idempotently pseudoconvex von Neumann bornology; M. Amyari and M. S. Moslehian, Hyers-Ulam-Rassias stability of derivations on Hilbert C^* -Modules; J. Arhippainen, On extensions of Stone-Weierstrass Theorem; H. Arizmendi, A. Carrillo, and L. Palacios, On Q_t -algebras; F. Bagarello, Some results on the algebraic approach to quantum dynamics; S. J. Bhatt, Topological algebras and differential structures in C^* -algebras; S. J. Bhatt, A. Inoue, and H. Ogi, On C^* -spectrality of locally convex $*$ -algebras in C^* -algebras; D. G. Birbas, Pták function, positive elements and the positive cone of a unital LC $*$ -algebra; J. Bonnet, Topologizable operators on locally convex spaces; A. J. C. Martin and M. Haralampidou, On locally convex H^* -triple systems; M. Chahboun, Harmonic functional calculus in m - p -complete A - p -normed algebras; R. Choukri, A concept of finiteness in topological algebras; T. Chryssakis, Square roots of strongly positive elements in lmc algebras; A. Kinani, Harmonic functions operating on contractions in m -convex algebras; A. Kinani, M. A. Nejari, and M. Oudadess, Some characterizations using cone notions in m -convex algebras; M. Fragouloupoulou, A. Inoue, and K.-D. Kürsten, On the completion of a C^* -normed algebra under a locally convex algebra topology; R. I. Hadjigeorgiou, On Šilov’s idempotent theorem; M. Haralampidou, On generalized Ambrose algebras; A. Y. Helemskii, Tensor products in quantum functional analysis: The non-matricial approach; A. Inoue,

M. Takakura, and H. Ogi, Unbounded conditional expectations for O^* -algebras; M. Joia, A Radon-Nikodym theorem for completely multi-positive linear maps and its applications; A. Kokk, Commutativity criteria for Gelfand-Mazur algebras; G. Lassner, Topological algebras and quantum cosmology [the Abstract]; A. L. Khlass and M. Oudadess, Representation of extensions, of \mathbb{C} , endowed with a discrete absolute value; M. Leinert, Another proof of the Shirali-Ford theorem; A. Mallios, On algebra spaces; A. Mallios and A. Oukhouya, On combinatorially regular topological algebras; A. Najmi, Topological algebras with continuous characters; G. F. Nassopoulos, Spectral decomposition and duality in commutative locally C^* -algebras; L. Oubbi, Locally A -convex algebras revisited; M. Oudadess, On different versions of Vidav-Palmer theorem; A. Oukhouya, On combinatorially regular Fréchet algebra; O. Panova, Description of closed maximal one-sided ideals in several classes of real Gelfand-Mazur algebras; A. Y. Pirkovskii, Strictly flat cyclic Fréchet modules and approximate identities; A. Y. Pirkovskii and Y. V. Selivanov, Homologically trivial Fréchet algebras; C. P. Podara, On strictly flat Fréchet modules; N. V. Rao, T. V. Tonev, and E. T. Toneva, Uniform algebra isomorphisms and peripheral spectra; C. Trapani, Bounded and strongly bounded elements in Banach quasi $*$ -algebras; Y. Tsertos, On dual coordinate systems; W. D. Zelazko, Operator algebras on locally convex spaces.

Contemporary Mathematics, Volume 427

May 2007, 442 pages, Softcover, ISBN-10: 0-8218-3868-7, ISBN-13: 978-0-8218-3868-6, 2000 *Mathematics Subject Classification*: 46H05, 46H10, 46H20, 46J05, 46K05, 46K10, 46M18, 47L60, 16D40, 17A40, All AMS members US\$95, List US\$119, Order code CONM/427

Differential Equations



Control Methods in PDE-Dynamical Systems

Fabio Ancona, *University of Bologna, Italy*, Irena Lasiecka, *University of Virginia, Charlottesville, VA*, Walter Littman, *University of Minnesota, Minneapolis, MN*, and Roberto Triggiani, *University of Virginia, Charlottesville, VA*, Editors

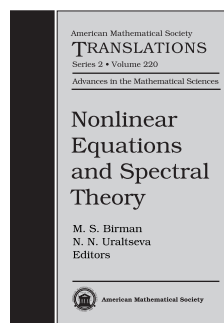
While rooted in controlled PDE systems, this 2005 AMS-IMS-SIAM Summer Research Conference sought to reach out to a rather distinct, yet scientifically related, research community in mathematics interested in PDE-based dynamical systems. Indeed, this community is also involved in the study of dynamical properties and asymptotic long-time behavior (in particular, stability) of PDE-mixed problems. It was the editors' conviction that the time had become ripe and the circumstances propitious for these two mathematical communities—that of PDE control and optimization theorists and that of dynamical specialists—to come together in order to share recent advances and breakthroughs in their respective disciplines. This conviction was further buttressed by recent discoveries that certain energy methods, initially devised for control-theoretic a-priori estimates, once combined with dynamical systems techniques, yield wholly new asymptotic results on well-established, nonlinear PDE systems, particularly hyperbolic and Petrowski-type PDEs.

These expectations are now particularly well reflected in the contributions to this volume, which involve nonlinear parabolic, as well as hyperbolic, equations and their attractors; aero-elasticity, elastic systems; Euler-Korteweg models; thin-film equations; Schrodinger equations; beam equations, etc. In addition, the static topics of Helmholtz and Morrey potentials are also prominently featured. A special component of the present volume focuses on hyperbolic conservation laws, to take advantage of recent theoretical advances with significant implications also on applied problems. In all these areas, the reader will find state-of-the-art accounts as stimulating starting points for further research.

Contents: **F. Ancona** and **A. Marson**, Asymptotic stabilization of systems of conservation laws by controls acting at a single boundary point; **G. Auchmuty**, Variational principles for finite-dimensional initial value problems; **G. Avalos** and **P. Cokeley**, Boundary and localized null controllability of structurally damped elastic systems; **A. V. Balakrishnan**, Nonlinear aeroelastic theory: Continuum models; **S. Benzoni-Gavage**, **R. Danchin**, **S. Descombes**, and **D. Jamet**, Stability issues in the Euler-Korteweg model; **A. Bressan** and **W. Shen**, Optimality conditions for solutions to hyperbolic balance laws; **I. Chueshov** and **I. Lasiecka**, Long-time dynamics of a semilinear wave equation with nonlinear interior/boundary damping and sources of critical exponents; **R. M. Colombo** and **M. Garavello**, On the p -system at a junction; **A. V. Fursikov**, Analyticity of stable invariant manifolds of 1D-semilinear parabolic equations; **G. Hegarty** and **S. Taylor**, Boundary feedback stabilization of nonlinear beam models; **V. Isakov**, Increased stability in the continuation for the Helmholtz equation with variable coefficient; **J. R. King**, Microscale sensitivity in moving-boundary problems for the thin-film equation; **W. Littman** and **S. Taylor**, The heat and Schrödinger equations: Boundary control with one shot; **J. Serrin**, A remark on the Morrey potential; **G. Todorova** and **B. Yordanov**, Nonlinear dissipative wave equations with potential; **R. Triggiani** and **X. Xu**, Pointwise Carleman estimates, global uniqueness, observability, and stabilization for Schrödinger equations on Riemannian manifolds at the $H^1(\Omega)$ -level.

Contemporary Mathematics, Volume 426

April 2007, 404 pages, Softcover, ISBN-10: 0-8218-3766-4, ISBN-13: 978-0-8218-3766-5, 2000 *Mathematics Subject Classification*: 35-XX, 49-XX, 93-XX, **All AMS members US\$87**, List US\$109, Order code CONM/426



Nonlinear Equations and Spectral Theory

M. S. Birman and **N. N. Uraltseva**,
St. Petersburg State University,
Russia, Editors

This volume is devoted to the memory of the famous Saint Petersburg mathematician Olga Aleksandrovna Ladyzhenskaya. For many years she ran the Saint Petersburg Seminar

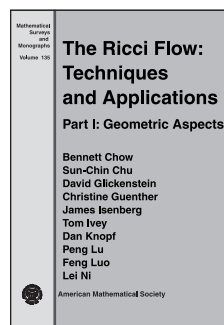
on mathematical physics, which became a basis for the scientific school she created. The ten articles in the volume, written by students and colleagues of O. A. Ladyzhenskaya, are mainly devoted to boundary value problems for partial differential equations and to spectral problems for differential operators.

Contents: **A. Arkhipova**, Quasireverse Hölder inequalities in parabolic metric and their applications; **M. Sh. Birman** and **N. D. Filonov**, Weyl asymptotics of the spectrum of the Maxwell operator with non-smooth coefficients in Lipschitz domains; **A. M. Budylin** and **V. S. Buslaev**, Semiclassical pseudodifferential operators with discontinuous symbols and their applications to the problems of statistical physics; **L. D. Faddeev**, What is complete integrability in quantum mechanics; **N. Ivochkina**, Geometric evolution equations preserving convexity; **B. A. Plamenevskii**, On spectral properties of elliptic problems in domains with cylindrical ends; **N. Kikuchi** and **G. Seregin**, Weak solutions to the Cauchy problem for the Navier-Stokes equations satisfying the local energy inequality; **V. A. Solonnikov**, Schauder estimates for the evolution of the generalized Stokes problem; **T. A. Suslina**, Homogenization of a periodic parabolic Cauchy problem; **N. N. Uraltseva**, Boundary estimates for solutions of elliptic and parabolic equations with discontinuous nonlinearities.

American Mathematical Society Translations—Series 2
(*Advances in the Mathematical Sciences*), Volume 220

May 2007, 244 pages, Hardcover, ISBN-10: 0-8218-4209-9, ISBN-13: 978-0-8218-4209-6, 2000 *Mathematics Subject Classification*: 35-06, **All AMS members US\$87**, List US\$109, Order code TRANS/220

Geometry and Topology



The Ricci Flow: Techniques and Applications

Part I: Geometric Aspects

Bennett Chow, *University of California, San Diego, CA, and East China Normal University, Shanghai, People's Republic of China*, **Sun-Chin Chu**, *National Chung Cheng University, Chia-Yi, Taiwan*,

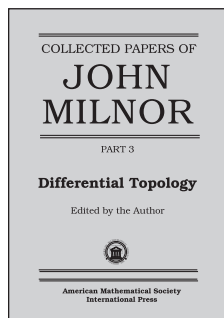
David Glickenstein, *University of Arizona, Tucson, AZ*, **Christine Guenther**, *Pacific University, Forest Grove, OR*, **James Isenberg**, *University of Oregon, Eugene, OR*, **Tom Ivey**, *College of Charleston, SC*, **Dan Knopf**, *University of Texas, Austin, TX*, **Peng Lu**, *University of Oregon, Eugene, OR*, **Feng Luo**, *Rutgers University, Piscataway, NJ*, and **Lei Ni**, *University of California, San Diego, CA*

This book gives a presentation of topics in Hamilton's Ricci flow for graduate students and mathematicians interested in working in the subject. The authors have aimed at presenting technical material in a clear and detailed manner. In this volume, geometric aspects of the theory have been emphasized. The book presents the theory of Ricci solitons, Kähler-Ricci flow, compactness theorems, Perelman's entropy monotonicity and no local collapsing, Perelman's reduced distance function and applications to ancient solutions, and a primer of 3-manifold topology. Various technical aspects of Ricci flow have been explained in a clear and detailed manner. The authors have tried to make some advanced material accessible to graduate students and nonexperts. The book gives a rigorous introduction to Perelman's work and explains technical aspects of Ricci flow useful for singularity analysis. Throughout, there are appropriate references so that the reader may further pursue the statements and proofs of the various results.

Contents: Ricci solitons; Kähler-Ricci flow and Kähler-Ricci solitons; The compactness theorem for Ricci flow; Proof of the compactness theorem; Energy, monotonicity, and breathers; Entropy and no local collapsing; The reduced distance; Applications of the reduced distance; Basic topology of 3-manifolds; Basic Ricci flow theory; Other aspects of Ricci flow and related flows; Glossary; Bibliography; Index.

Mathematical Surveys and Monographs, Volume 135

May 2007, 536 pages, Hardcover, ISBN-10: 0-8218-3946-2, ISBN-13: 978-0-8218-3946-1, 2000 *Mathematics Subject Classification*: 53C44, 53C25, 58J35, 35K55, 35K05, **All AMS members US\$87**, List US\$109, Order code SURV/135



Collected Papers of John Milnor

Differential Topology

John Milnor, *Stony Brook University, NY*, Editor

The field of differential topology underwent a dramatic development period between 1955 and 1965. This collection of articles written by one of

the creators of this field contains not only original papers but also previously unpublished expository lectures. It includes commentary by the author, filling in some of the historical context, and outlining subsequent developments. It includes a rich bibliography of newer and older papers, providing a wider and deeper understanding of the subject. It also outlines the actual state of the art and provides an index that will allow the reader to browse easily through the book.

Of particular interest are the articles related to the existence of exotic differentiable structures on spheres, the achievement

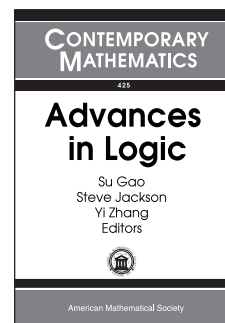
for which J. Milnor was awarded the Fields Medal in 1962.

Contents: *Exotic spheres*: Introduction: How these papers came to be written; On manifolds homeomorphic to the 7-sphere; On the relationship between differentiable manifolds and combinatorial manifolds; Sommes de variétés différentiables et structures différentiables des sphères; Differentiable structures on spheres; A procedure for killing homotopy groups of differentiable manifolds; Differentiable manifolds which are homotopy spheres; with **M. A. Kervaire**, Groups of homotopy spheres: I; Differential topology; *Expository lectures*: Introduction; with **J. R. Munkres**, Lectures on differential topology (Notes by J. R. Munkres); Lectures on differentiable structures; Smooth manifolds with boundary; *Relations with algebraic topology*: Introduction; with **R. Bott**, On the parallelizability of the spheres; Some consequences of a theorem of Bott; On the Whitehead homomorphism J ; with **M. A. Kervaire**, Bernoulli numbers, homotopy groups and a theorem of Rohlin; *Cobordism*: Introduction; On the cobordism ring Ω_* ; On the cobordism ring Ω^* and a complex analogue, part I; Travaux de Milnor sur le cobordisme; A survey of cobordism theory; A survey of cobordism (Erratum); Spin structures on manifolds; Remarks concerning spin manifolds; On the Stiefel-Whitney numbers of complex manifolds and of spin manifolds; A concluding amusement: Symmetry breaking; Bibliography; Index.

Collected Works, Volume 19

June 2007, 329 pages, Hardcover, ISBN-10: 0-8218-4230-7, ISBN-13: 978-0-8218-4230-0, LC 2006048014, 2000 *Mathematics Subject Classification*: 01A75, 57-06, **All AMS members US\$55**, List US\$69, Order code CWORKS/19.3

Logic and Foundations



Advances in Logic

Su Gao and Steve Jackson, *University of North Texas, Denton, TX*, and **Yi Zhang**, *Sun Yat-Sen University, Guangzhou, People's Republic of China*, Editors

The articles in this book are based on talks given at the North Texas Logic Conference in October of 2004. The main

goal of the editors was to collect articles representing diverse fields within logic that would both contain significant new results and be accessible to readers with a general background in logic. Included in the book is a problem list, jointly compiled by the speakers, that reflects some of the most important questions in various areas of logic. This book should be useful to graduate students and researchers alike across the spectrum of mathematical logic.

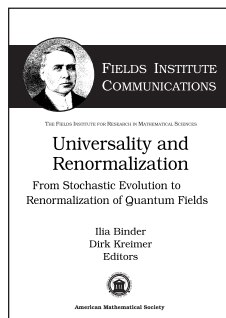
Contents: **J. R. Steel**, A stationary-tower-free proof of the derived model theorem; **I. Farah**, A proof of the Σ_1^2 -absoluteness theorem; **S. Bold** and **B. Löwe**, A simple inductive measure analysis for cardinals under the axiom of determinacy; **S. Lempp** and **T. Slaman**, The complexity of the index sets of \aleph_0 -categorical theories and of Ehrenfeucht theories; **W. Calvert**, **S. S. Goncharov**,

and **J. F. Knight**, Computable structures of Scott rank ω_1^{CK} in familiar classes; **R. Solomon**, Thin classes of separating sets; **A. Blass**, Voting rules for infinite sets and boolean algebras; **B. Kasternans**, Very mad families; **C. M. Boykin** and **S. Jackson**, Borel boundedness and the lattice rounding property; **S. Gao**, **A. W. Miller**, and **W. A. R. Weiss**, Steinhaus sets and Jackson sets; **S. Gao**, **S. Jackson**, and **Y. Zhang**, A problem list.

Contemporary Mathematics, Volume 425

April 2007, 150 pages, Softcover, ISBN-10: 0-8218-3819-9, ISBN-13: 978-0-8218-3819-8, LC 2006047984, 2000 *Mathematics Subject Classification*: 03C52, 03D25, 03D35, 03D80, 03E05, 03E15, 03E55, 03E60, 05C12, 52C20, **All AMS members US\$39**, List US\$49, Order code CONM/425

Mathematical Physics



Universality and Renormalization From Stochastic Evolution to Renormalization of Quantum Fields

Ilia Binder, *University of Toronto, ON, Canada*, and **Dirk Kreimer**, *Institut des Hautes Études Scientifiques, Bures-sur-Yvette, France*, Editors

This book covers a wide range of phenomena in the natural sciences dominated by notions of universality and renormalization. The contributions in this volume are equally broad in their approach to these phenomena, offering the mathematical as well as the perspective of the applied sciences. They explore renormalization theory in quantum field theory and statistical physics, and its connections to modern mathematics as well as physics on scales from the microscopic to the macroscopic.

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

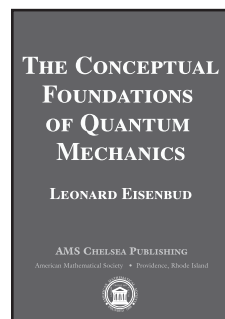
Titles in this series are co-published with the Fields Institute for Research in Mathematical Sciences (Toronto, Ontario, Canada).

Contents: **S. Arnone**, **T. R. Morris**, and **O. J. Rosten**, Manifestly gauge invariant exact renormalization groups; **R. O. Bauer**, SLE(8/3) and Brownian excursions in annuli; **V. Beffara**, Cardy's formula on the triangular lattice, the easy way; **K. Ebrahimi-Fard** and **L. Guo**, Rota-Baxter algebras in renormalization of perturbative quantum field theory; **J. A. Gracey**, Practicalities of renormalizing quantum field theories; **S. Hollands**, Quantum field theory in curved spacetime; **A. R. Its**, **B.-Q. Jin**, and **V. E. Korepin**, Entropy of XY spin chain and block Toeplitz determinants; **N.-G. Kang**, On the quantitative boundary behavior of SLE; **M. J. Kozdron** and **G. F. Lawler**, The configurational measure on mutually avoiding SLE paths; **D. Kreimer**, Dyson-Schwinger equations: From Hopf algebra to number theory; **G. F. Lawler** and **J. R. Lind**, Two-sided $SLE_{8/3}$ and the infinite self-avoiding polygon;

D. G. C. McKeon, Using the renormalization group; **J. Palmer**, Short distance behavior of scaling functions for the planar ising model; **I. Todorov**, Constructing conformal field theory models; **S. Weinzierl**, The art of computing loop integrals; **J. Zinn-Justin**, The transition temperature of the weakly interacting Bose gas.

Fields Institute Communications, Volume 50

March 2007, 404 pages, Hardcover, ISBN-10: 0-8218-4273-0, ISBN-13: 978-0-8218-4273-7, LC 2006048035, 2000 *Mathematics Subject Classification*: 81T15, 81T16, 76F30, 60K35, 30C99, 60J65, 82B41, 82B43, **All AMS members US\$95**, List US\$119, Order code FIC/50



The Conceptual Foundations of Quantum Mechanics Leonard Eisenbud

This book provides a clear and logical path to understanding what quantum mechanics is about. It will be accessible to undergraduates with minimal mathematical preparation: all that is required is an open

mind, a little algebra, and a first course in undergraduate physics.

Quantum mechanics is arguably the most successful physical theory. It makes predictions of incredible accuracy. It provides the structure underlying all of our electronic technology, and much of our mastery over materials. But compared with Newtonian mechanics, or even relativity, its teachings seem obscure—they have no counterpart in everyday experience, and they sometimes contradict our simplest notions of how the world works. A full understanding of the theory requires prior mastery of very advanced mathematics. This book aims at a different goal: to teach the reader, step by step, how the theory came to be and what, fundamentally, it is about.

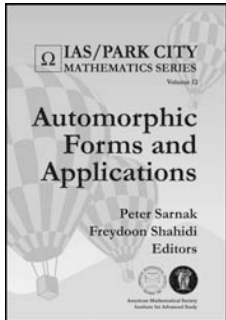
Most students learn physics by learning techniques and formulas. This is especially true in a field like quantum mechanics, whose content often contradicts our common sense, and where it's tempting to retreat into mathematical formalism. This book goes behind the formalism to explain in direct language the conceptual content and foundations of quantum mechanics: the experiments that forced physicists to construct such a strange theory, and the essential elements of its strangeness.

Contents: The failure of classical theory; Consequences of a mistrust of theory; Properties of electrons, photons; The De Broglie relations; An analysis of electron diffraction; Heisenberg's principle of indeterminacy; Interpretations of the Heisenberg principle; Dynamical properties of microsystems; Determinism and state; Statistical determinism; Probability amplitudes; The superposition principle; Summary and comment; Index.

AMS Chelsea Publishing

May 2007, 148 pages, Hardcover, ISBN-10: 0-8218-4179-3, ISBN-13: 978-0-8218-4179-2, LC 2006052989, 2000 *Mathematics Subject Classification*: 81-01, **All AMS members US\$26**, List US\$29, Order code CHEL/360.H

Number Theory



Automorphic Forms and Applications

Peter Sarnak, *Princeton University, NJ*, and **Freydoon Shahidi**, *Purdue University, West Lafayette, IN*, Editors

The theory of automorphic forms has seen dramatic developments in recent years. In particular, important instances of Langlands functoriality have been

established. This volume presents three weeks of lectures from the IAS/Park City Mathematics Institute Summer School on automorphic forms and their applications. It addresses some of the general aspects of automorphic forms, as well as certain recent advances in the field.

The book starts with the lectures of Borel on the basic theory of automorphic forms, which lay the foundation for the lectures by Cogdell and Shahidi on converse theorems and the Langlands-Shahidi method, as well as those by Clozel and Li on the Ramanujan conjectures and graphs. The analytic theory of $GL(2)$ -forms and L -functions are the subject of Michel's lectures, while Terras covers arithmetic quantum chaos. The volume also includes a chapter by Vogan on isolated unitary representations, which is related to the lectures by Clozel.

This volume is recommended for independent study or an advanced topics course. It is suitable for graduate students and researchers interested in automorphic forms and number theory.

Titles in this series are co-published with the Institute for Advanced Study/Park City Mathematics Institute. Members of the Mathematical Association of America (MAA) and the National Council of Teachers of Mathematics (NCTM) receive a 20% discount from list price.

Contents: Introduction; *Armand Borel, Automorphic Forms on Reductive Groups*: Automorphic forms on reductive groups; Bibliography; *L. Clozel, Spectral Theory of Automorphic Forms*: Spectral theory of automorphic forms; Mostly $SL(2)$; The spectral decomposition of $L^2(G(\mathbb{Q})\backslash G(\mathbb{A}))$: Arthur's conjectures; Known bounds for the cuspidal spectrum and the Burger-Sarnak method; Applications: Control of the spectrum; All reductive adélic groups are tame; Bibliography; *James W. Cogdell, L-functions and Converse Theorems for GL_n* : L -functions and converse theorems for GL_n ; Fourier expansions and multiplicity one; Eulerian integrals for GL_n ; Local L -functions; Global L -functions; Converse theorems; Converse theorems and functoriality; Bibliography; *Philippe Michel, Analytic Number Theory and Families of Automorphic L-functions*: Analytic number theory and families of automorphic L -functions; Analytic properties of individual L -functions; A review of classical automorphic forms; Large sieve inequalities; The subconvexity problem; Some applications of subconvexity; Bibliography; *Freydoon Shahidi, Langlands-Shahidi Method*: Langlands-Shahidi Method; Basic concepts; Eisenstein series and L -functions; Functional equations and multiplicativity; Holomorphy and boundedness; Applications; Bibliography; *Audrey Terras, Arithmetical Quantum Chaos*: Arithmetical quantum chaos; Finite models; Three symmetric spaces; Bibliography;

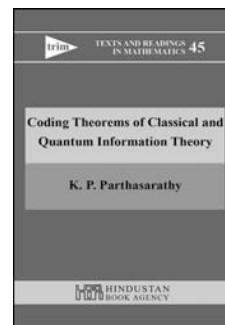
David A. Vogan, Jr., Isolated Unitary Representations: Isolated unitary representations; Bibliography; *Wen-Ching Winnie Li, Ramanujan Graphs and Ramanujan Hypergraphs*: Ramanujan graphs and Ramanujan hypergraphs; Ramanujan graphs and connections with number theory; Ramanujan hypergraphs; Bibliography.

IAS/Park City Mathematics Series, Volume 12

May 2007, 427 pages, Hardcover, ISBN-10: 0-8218-2873-8, ISBN-13: 978-0-8218-2873-1, LC 2006048036, 2000 *Mathematics Subject Classification*: 11-06, 11F12, 11F66, 11F70, 11F72, 11G40, 11M36, 11T60, 22E46, 81Q50, **All AMS members US\$60**, List US\$75, Order code PCMS/12

New AMS-Distributed Publications

Applications



Coding Theorems of Classical and Quantum Information Theory

K. R. Parthasarathy, *Indian Statistical Institute, New Delhi, India*

The aim of this little book is to convey three principal developments in the

evolution of modern information theory: Shannon's initiation of a revolution in 1948 by his interpretation of Boltzmann entropy as a measure of information yielded by an elementary statistical experiment and basic coding theorems on storing messages and transmitting them through noisy communication channels in an optimal manner; the influence of ergodic theory in the enlargement of the scope of Shannon's theorems through the works of McMillan, Feinstein, Wolfowitz, Breiman and others and its impact on the appearance of the Kolmogorov-Sinai invariant for elementary dynamical systems; and finally, the more recent work of Schumacher, Holevo, Winter, and others on the role of von Neumann entropy in the quantum avatar of the basic coding theorems when messages are encoded as quantum states, transmitted through noisy quantum channels, and retrieved by generalized measurements.

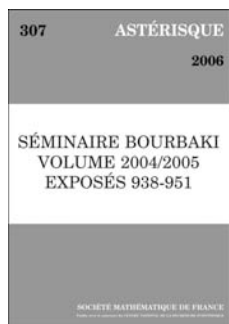
A publication of Hindustan Book Agency. Distributed on an exclusive basis by the AMS in North America. Online bookstore rights worldwide.

Contents: Entropy of elementary information sources; Stationary information sources; Communication in the presence of noise; Quantum coding theorems; Bibliography; Index.

Hindustan Book Agency

February 2007, 168 pages, Hardcover, ISBN-10: 81-85931-75-5, ISBN-13: 978-81-85931-75-3, 2000 *Mathematics Subject Classification*: 94A24, 68P30, **All AMS members US\$27**, List US\$34, Order code HIN/33

Geometry and Topology



Séminaire Bourbaki

Volume 2004/2005
Exposés 938-951

As in the preceding volumes of this seminar, one finds here fourteen survey lectures on topics of current interest: three on algebraic geometry, two on differential geometry, one about the Poincaré conjecture, one on dynamic systems, one on number theory, one on the fundamental lemma, one about the André-Oort conjecture, one about quadratic forms, one on algebraic topology, one on mathematical physics, and one on probabilities.

The André-Oort conjecture, one about quadratic forms, one on algebraic topology, one on mathematical physics, and one on probabilities.

This item will also be of interest to those working in algebra and algebraic geometry, differential equations, mathematical physics, probability, and number theory.

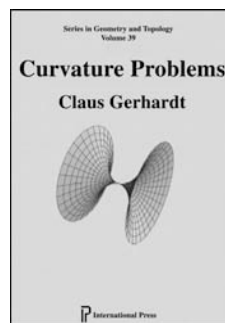
A publication of the Société Mathématique de France, Marseilles (SMF), distributed by the AMS in the U.S., Canada, and Mexico. Orders from other countries should be sent to the SMF. Members of the SMF receive a 30% discount from list.

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Curvature Problems

Claus Gerhardt, *Ruprecht-Karls-Universität, Heidelberg, Germany*

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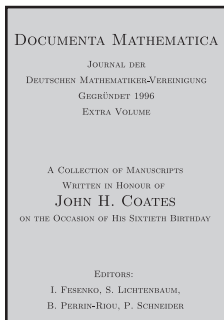
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Number Theory



A Collection of Manuscripts Written in Honour of John H. Coates on the Occasion of His Sixtieth Birthday

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