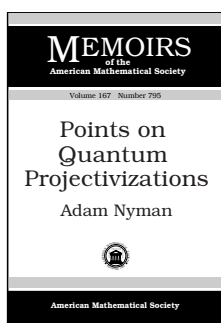


New Publications Offered by the AMS

Algebra and Algebraic Geometry



Points on Quantum Projectivizations

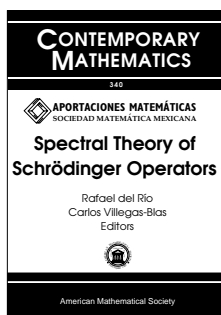
Adam Nyman, *University of Montana, Missoula*

Contents: Introduction; Compatibilities on squares; Construction of the functor Γ_n ; Compatibility with descent; The representation of Γ_n for low n ; The bimodule Segre embedding; The representation of Γ_n for High n ; Bibliography; Index.

Memoirs of the American Mathematical Society, Volume 167, Number 795

March 2004, 142 pages, Softcover, ISBN 0-8218-3495-9, LC 2003061936, 2000 *Mathematics Subject Classification*: 14A22; 18D30, **Individual member \$35**, List \$58, Institutional member \$46, Order code MEMO/167/795N

Analysis



Spectral Theory of Schrödinger Operators

Rafael del Río and Carlos Villegas-Blas, *Universidad Nacional Autónoma de México*, Editors

This volume gathers the articles based on a series of lectures from a workshop held at the Institute of Applied

Mathematics of the National University of Mexico. The aim of the book is to present to a non-specialized audience the basic tools needed to understand and appreciate new trends of research on Schrödinger operator theory.

Topics discussed include various aspects of the spectral theory of differential operators, the theory of self-adjoint operators, finite rank perturbations, spectral properties of

random Schrödinger operators, and scattering theory for Schrödinger operators.

The material is suitable for graduate students and research mathematicians interested in differential operators, in particular, spectral theory of Schrödinger operators.

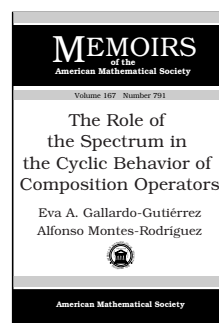
This item will also be of interest to those working in differential equations.

This volume is a joint publication of the American Mathematical Society and the Sociedad Matemática Mexicana. Members of the SMM may order directly from the AMS at the AMS member price.

Contents: A. M. Hinz, Topics from spectral theory of differential operators; J. Brasche, Spectral theory for self-adjoint extensions; I. Veselić, Integrated density of states and Wegner estimates for random Schrödinger operators; P. Kurasov, Singular and supersingular perturbations: Hilbert space methods; F. Bentosela, Scattering and spectral properties of two surface models.

Contemporary Mathematics, Volume 340

February 2004, 249 pages, Softcover, ISBN 0-8218-3297-2, 2000 *Mathematics Subject Classification*: 81Q10, 81-06, 81Q05; 81-02, **All AMS members \$55**, List \$69, Order code CONM/340N



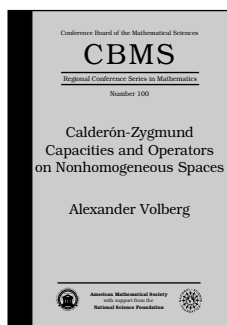
The Role of the Spectrum in the Cyclic Behavior of Composition Operators

Eva A. Gallardo-Gutiérrez, *University of Zaragoza, Spain*, and Alfonso Montes-Rodríguez, *University of Seville, Spain*

Contents: Introduction and preliminaries; Linear fractional maps with an interior fixed point; Non elliptic automorphisms; The parabolic non automorphism; Supercyclic linear fractional composition operators; Endnotes; Bibliography.

Memoirs of the American Mathematical Society, Volume 167, Number 791

March 2004, 81 pages, Softcover, ISBN 0-8218-3432-0, LC 2003061940, 2000 *Mathematics Subject Classification*: 47B38, 47A16; 30D55, 30D05, **Individual member \$31**, List \$51, Institutional member \$41, Order code MEMO/167/791N



Calderón-Zygmund Capacities and Operators on Nonhomogeneous Spaces

Alexander Volberg, *Michigan State University, East Lansing*

Singular integral operators play a central role in modern harmonic

analysis. Simplest examples of singular kernels are given by Calderón-Zygmund kernels. Many important properties of singular integrals have been thoroughly studied for Calderón-Zygmund operators.

In the 1980's and early 1990's, Coifman, Weiss, and Christ noticed that the theory of Calderón-Zygmund operators can be generalized from Euclidean spaces to spaces of homogeneous type. The purpose of this book is to make the reader believe that homogeneity (previously considered as a cornerstone of the theory) is not needed. This claim is illustrated by presenting two harmonic analysis problems famous for their difficulty.

The first problem treats semiadditivity of analytic and Lipschitz harmonic capacities. The volume presents the first self-contained and unified proof of the semiadditivity of these capacities. The book details Tolsa's solution of Painlevé's and Vitushkin's problems and explains why these are problems of the theory of Calderón-Zygmund operators on nonhomogeneous spaces. The exposition is not dimension-specific, which allows the author to treat Lipschitz harmonic capacity and analytic capacity at the same time.

The second problem considered in the volume is a two-weight estimate for the Hilbert transform. This problem recently found important applications in operator theory, where it is intimately related to spectral theory of small perturbations of unitary operators.

The book presents a technique that can be helpful in overcoming rather bad degeneracies (i.e., exponential growth or decay) of underlying measure (volume) on the space where the singular integral operator is considered. These situations occur, for example, in boundary value problems for elliptic PDE's in domains with extremely singular boundaries. Another example involves harmonic analysis on the boundaries of pseudoconvex domains that goes beyond the scope of Carnot-Carathéodory spaces.

The book is suitable for graduate students and research mathematicians interested in harmonic analysis.

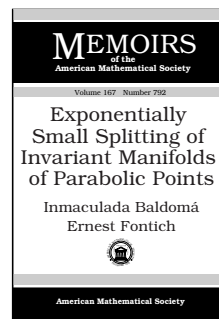
Contents: Introduction; Preliminaries on capacities; Localization of Newton and Riesz potentials; From distribution to measure. Carleson property; Potential neighborhood that has properties (3.13)–(3.14); The tree of the proof; The first reduction to nonhomogeneous Tb theorem; The second reduction; The third reduction; The fourth reduction; The proof of nonhomogeneous Cotlar's lemma. Arbitrary measure; Starting the proof of nonhomogeneous nonaccretive Tb theorem; Next step in theorem 10.6. Good and bad functions; Estimate of the diagonal sum. Remainder in theorem 3.3; Two-weight estimate for the Hilbert transform. Preliminaries; Necessity in the main theorem; Two-weight Hilbert transform. Towards the main theorem; Long range interaction; The rest of the long range interaction; The short range interaction; Difficult terms and

several paraproducts; Two-weight Hilbert transform and maximal operator; Bibliography.

CBMS Regional Conference Series in Mathematics, Number 100

December 2003, 167 pages, Softcover, ISBN 0-8218-3252-2, LC 2003062990, 2000 *Mathematics Subject Classification*: 42B20; 32A55, 31A15, 31C05, **All Individuals \$31**, List \$39, Order code CBMS/100N

Differential Equations



Exponentially Small Splitting of Invariant Manifolds of Parabolic Points

Inmaculada Baldomá and Ernest Fontich, *University of Barcelona, Spain*

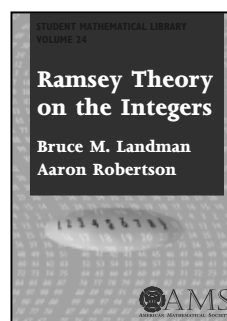
Contents: Notation and main results; Analytic properties of the homoclinic

orbit of the unperturbed system; Parameterization of local invariant manifolds; Flow box coordinates; The extension theorem; Splitting of separatrices; References.

Memoirs of the American Mathematical Society, Volume 167, Number 792

March 2004, 83 pages, Softcover, ISBN 0-8218-3445-2, LC 2003061939, 2000 *Mathematics Subject Classification*: 37J45; 70K44, 34C37, 34E10, 37C29, **Individual member \$32**, List \$54, Institutional member \$43, Order code MEMO/167/792N

Discrete Mathematics and Combinatorics



Ramsey Theory on the Integers

Bruce M. Landman, *State University of West Georgia, Carrollton*, and Aaron Robertson, *Colgate University, Hamilton, NY*

Ramsey theory is the study of the structure of mathematical objects that is preserved under partitions. In its full generality, Ramsey theory is quite powerful, but can quickly become complicated. By limiting the focus of this book to Ramsey theory applied to the set of integers, the authors have produced a gentle, but meaningful, introduction to an important and enticing branch of modern mathematics.

Ramsey Theory on the Integers offers students something quite rare for a book at this level: a glimpse into the world of

mathematical research and the opportunity for them to begin pondering unsolved problems.

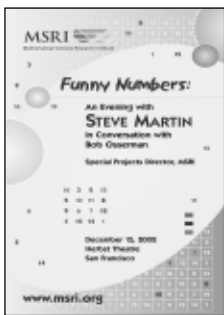
In addition to being the first truly accessible book on Ramsey theory, this innovative book also provides the first cohesive study of Ramsey theory on the integers. It contains perhaps the most substantial account of solved and unsolved problems in this blossoming subarea of Ramsey theory. The result is a breakthrough book that will engage students, teachers, and researchers alike.

Contents: Preliminaries; Van der Waerden's theorem; Supersets of AP ; Subsets of AP ; Other generalizations of $w(k;r)$; Arithmetic progressions (mod m); Other variations on van der Waerden's theorem; Schur's theorem; Rado's theorem; Other topics; Notation; Bibliography; Index.

Student Mathematical Library, Volume 24

January 2004, 317 pages, Softcover, ISBN 0-8218-3199-2, LC 2003062937, 2000 *Mathematics Subject Classification*: 05D10, **All AMS members \$39**, List \$49, Order code STML/24N

General and Interdisciplinary



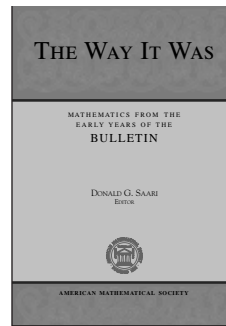
Funny Numbers: An Evening with Steve Martin in Conversation with Bob Osserman

Author and actor Steve Martin chatted with mathematician Robert Osserman of the Mathematical Sciences Research Institute (MSRI) in Berkeley on December 15, 2002 at San Francisco's

Herbst Theatre. They discussed literature and mathematics, why two banjos are like one slide rule, and whether we really know what π is. Steve Martin read and enacted excerpts from his works, reminisced about his work for the Smothers Brothers, and discussed the authors who influenced him. The hilarity of this event as it spins out of control has to be seen (on this videotape) to be believed!

Distributed by the AMS on behalf of the Mathematical Sciences Research Institute (Berkeley, CA).

December 2003, NTSC format on one-half inch VHS videotape, approximately 81 minutes, ISBN 0-9639903-3-0, 2000 *Mathematics Subject Classification*: 52-XX, 60-XX, List \$25, Order code VIDEO/103N



The Way It Was Mathematics from the Early Years of the Bulletin

Donald G. Saari, *University of California, Irvine*, Editor

The formative years of the American Mathematical Society coincided with a time of remarkable development in mathematics. During this period, the

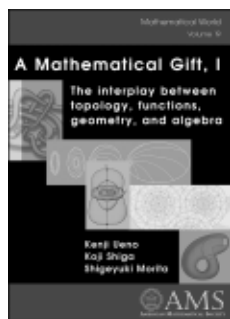
Bulletin of the American Mathematical Society and its predecessor, *The Bulletin of the New York Mathematical Society*, served as a primary vehicle for reporting mathematics to American mathematicians. As a result, some of the most important and fundamental work of early twentieth-century mathematics found its way into the *Bulletin*. Milestone articles include Hilbert's problems presented at the 1900 Paris International Congress of Mathematicians (ICM), Poincaré's 1904 lecture on the future of mathematical physics (with commentary suggesting that he was tantalizingly close to capturing the notion of relativity), and Klein's Erlangen program; all of these articles received added publicity when the first English translation was published in the *Bulletin*.

This book reproduces these and other well-written articles from the early *Bulletin*, offering readers the best way to experience a slice of that time. Other articles in the book include, in particular, a report to American mathematicians about what happened at that important 1900 ICM meeting and three articles from the scientific portion of the 1904 centennial celebration of the Louisiana Purchase: Darboux describing the development of geometry, Pierpont focusing on nineteenth-century mathematics, and Poincaré emphasizing the significance of mathematical physics. Accompanying the transition from the nineteenth to twentieth century was that new important thing called "mathematical rigor". Included is an article by Klein reflecting the beliefs of the time with his promotion of rigor.

These are just some of the many topics characterizing the early days of the developing American mathematical community. The book offers a captivating review of mathematics through the early years of the *Bulletin*.

Contents: D. G. Saari, Introduction; D. G. Saari, Spirit of the time; J. Pierpont, The history of mathematics in the nineteenth century; F. Cajori, Evolution of criteria of convergence; C. A. Scott, The International Congress of Mathematicians in Paris; M. G. Darboux, A survey of the development of geometric methods; D. G. Saari, Fifth degree polynomials; J. Pierpont, Lagrange's place in the theory of substitutions; J. Pierpont, On the Ruffini-Abelian theorem; J. Pierpont, Early history of Galois' theory of equations; D. G. Saari, Henri Poincaré; E. W. Brown, Poincaré's mécanique céleste; H. Poincaré, The relations of analysis and mathematical physics; H. Poincaré, The present and the future of mathematical physics; D. G. Saari, Felix Klein; F. Klein, A comparative review of recent researches in geometry; F. Klein, The arithmetizing of mathematics; F. Klein, Riemann and his significance for the development of modern mathematics; D. G. Saari, David Hilbert; H. Poincaré, Review of Hilbert's "Foundations of geometry"; D. Hilbert, Mathematical problems.

January 2004, 326 pages, Softcover, ISBN 0-8218-2672-7, LC 2003063303, 2000 *Mathematics Subject Classification*: 00B60, **All AMS members \$36**, List \$45, Order code BULHIGN



A Mathematical Gift, I The interplay between topology, functions, geometry, and algebra

Kenji Ueno, *Kyoto University, Japan*, Koji Shiga, *Yokohama, Japan*, and Shigeyuki Morita, *Tokyo Institute of Technology, Japan*

This book will bring the beauty and fun of mathematics to the classroom. It offers serious mathematics in a lively, reader-friendly style. Included are exercises and many figures illustrating the main concepts.

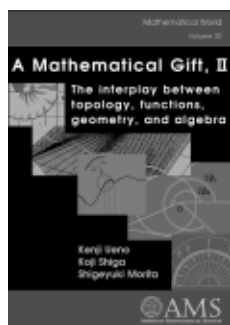
The first chapter presents the geometry and topology of surfaces. Among other topics, the authors discuss the Poincaré-Hopf theorem on critical points of vector fields on surfaces and the Gauss-Bonnet theorem on the relation between curvature and topology (the Euler characteristic). The second chapter addresses various aspects of the concept of dimension, including the Peano curve and the Poincaré approach. Also addressed is the structure of three-dimensional manifolds. In particular, it is proved that the three-dimensional sphere is the union of two doughnuts.

This is the first of three volumes originating from a series of lectures given by the authors at Kyoto University (Japan). It is suitable for classroom use for high school mathematics teachers and undergraduate mathematics courses in the sciences and liberal arts. The second volume is available as Volume 20 in the AMS series, *Mathematical World*. A third volume is forthcoming.

Contents: *Invitation to topology (Viewing figures globally):* Introduction; The Euler characteristic; Vortices created by winds and the Euler characteristic; Curvature of a surface and the Euler characteristic; *The story of dimension:* Introduction; Learning to appreciate dimension; What is dimension?; Three-dimensional figures; Physics and dimension.

Mathematical World, Volume 19

October 2003, 136 pages, Softcover, ISBN 0-8218-3282-4, LC 2003062778, 2000 *Mathematics Subject Classification:* 00-01, **All AMS members \$23**, List \$29, Order code MAWRLD/19N



A Mathematical Gift, II The interplay between topology, functions, geometry, and algebra

Kenji Ueno, *Kyoto University, Japan*, Koji Shiga, *Yokohama, Japan*, and Shigeyuki Morita, *Tokyo Institute of Technology, Japan*

The first chapter of this book talks about the theory of trigonometric and elliptic functions. It includes subjects such

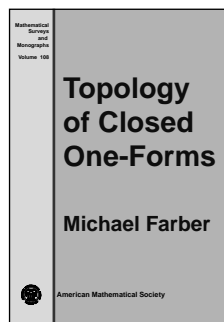
as power series expansions, addition and multiple-angle formulas, and arithmetic-geometric means. The second chapter, discusses various aspects of the Poncelet Closure Theorem. This discussion illustrates to the reader the idea of algebraic geometry as a method of studying geometric properties of figures using algebra as a tool.

This is the second of three volumes originating from a series of lectures given by the authors at Kyoto University (Japan). It is suitable for classroom use for high school mathematics teachers and for undergraduate mathematics courses in the sciences and liberal arts. The first volume is available as Volume 19 in the AMS series, *Mathematical World*. A third volume is forthcoming.

Contents: *The legacy of trigonometric functions:* Introduction; Trigonometric functions and infinite series; Elliptic functions; *Intersection of geometry and algebra:* Introduction; The Poncelet closure theorem; The Poncelet theorem for circles; The Poncelet theorem in the world of complex numbers; Proof of the Poncelet theorem using plane geometry; Conclusion.

Mathematical World, Volume 20

March 2004, approximately 131 pages, Softcover, ISBN 0-8218-3283-2, 2000 *Mathematics Subject Classification:* 00-01, **All AMS members \$23**, List \$29, Order code MAWRLD/20N



Topology of Closed One-Forms

Michael Farber, *Tel Aviv University, Israel, and University of Durham, England*

Viewed *locally*, a closed one-form on a manifold is a smooth function up to an additive constant. The *global* structure of a closed one-form is mainly determined by its de Rham cohomology class. In this book, Michael

Farber studies fascinating geometrical, topological, and dynamical properties of closed one-forms. In particular, he reveals the relations between their global and local features.

In 1981, S. P. Novikov initiated a generalization of Morse theory in which, instead of critical points of smooth functions, one deals with closed one-forms and their zeros. The first two chapters of the book, written in textbook style, give a detailed exposition of Novikov theory, which now plays a fundamental role in geometry and topology.

In the following chapters the author describes the universal chain complex that lives over a localization (in the sense of P. M. Cohn) of the group ring and relates the topology of the underlying manifold with information about zeros of closed one-forms. Using this complex, many different variations and generalizations of the Novikov inequalities are obtained, including Bott-type inequalities for closed one-forms, equivariant inequalities, and inequalities involving von Neumann Betti numbers. Another significant result in the book is a solution of the problem about exactness of the Novikov inequalities for manifolds with the infinite cyclic fundamental group.

One of the chapters deals with the problem raised by E. Calabi about intrinsically harmonic closed one-forms and their Morse numbers. Presented are the solution of this problem and a

detailed study of topological properties of singular foliations of closed one-forms.

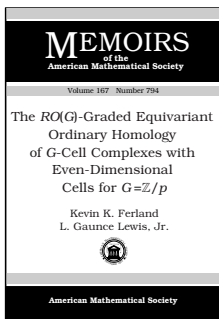
The last chapter suggests a completely new Lusternik-Schnirelman-type theory for dynamical systems. Closed 1-forms appear in dynamics through the concept of a Lyapunov 1-form of a flow. As is shown in the book, homotopy theory may be used to predict the existence of homoclinic orbits and homoclinic cycles in dynamical systems ("focusing effect").

The book is suitable for graduate students and researchers interested in geometry and topology.

Contents: The Novikov numbers; The Novikov inequalities; The universal complex; Construction of the universal complex; Bott-type inequalities; Inequalities with von Neumann Betti numbers; Equivariant theory; Exactness of the Novikov inequalities; Morse theory of harmonic forms; Lusternik-Schnirelman theory, closed 1-forms, and dynamics; Manifolds with corners; Morse-Bott function on manifolds with corners; Morse-Bott inequalities; Relative Morse theory; Bibliography; Index.

Mathematical Surveys and Monographs, Volume 108

March 2004, approximately 256 pages, Hardcover, ISBN 0-8218-3531-9, 2000 *Mathematics Subject Classification*: 58E05, 57R70; 57R30, **All AMS members \$55**, List \$69, Order code SURV/108N



The $RO(G)$ -Graded Equivariant Ordinary Homology of G -Cell Complexes with Even-Dimensional Cells for $G = \mathbb{Z}/p$

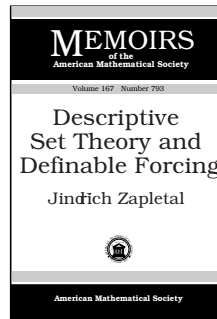
Kevin K. Ferland, *Bloomsburg University, PA*, and L. Gaunce Lewis, Jr., *Syracuse University, NY*

Contents: *Part 1. The Homology of \mathbb{Z}/p -Cell Complexes with Even-Dimensional Cells:* Preliminaries; The main freeness theorem (Theorem 2.6); An outline of the proof of the main freeness result (Theorem 2.6); Proving the single-cell freeness results; Computing $H_*^G(B \cup DV; A)$ in the key dimensions; Dimension-shifting long exact sequences; Complex Grassmannian manifolds; *Part 2. Observations about $RO(G)$ -Graded Equivariant Ordinary Homology:* The computation of H_*^S for arbitrary S ; Examples of H_*^S ; $RO(G)$ -graded box products; A weak Universal Coefficient Theorem; Observations about Mackey functors; Bibliography.

Memoirs of the American Mathematical Society, Volume 167, Number 794

March 2004, 129 pages, Softcover, ISBN 0-8218-3461-4, LC 2003061937, 2000 *Mathematics Subject Classification*: 55M35, 55N91, 55R40, 57S17; 14M15, 55P91, **Individual member \$34**, List \$56, Institutional member \$45, Order code MEMO/167/794N

Logic and Foundations



Descriptive Set Theory and Definable Forcing

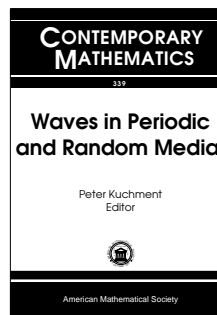
Jindřich Zapletal, *California Institute of Technology, Pasadena*

Contents: Introduction; Definable forcing adding a single real; The countable support iterations; Other forcings; Applications; Examples of cardinal invariants; The syntax of cardinal invariants; Effective descriptive set theory; Large cardinals.

Memoirs of the American Mathematical Society, Volume 167, Number 793

March 2004, 141 pages, Softcover, ISBN 0-8218-3450-9, LC 2003061938, 2000 *Mathematics Subject Classification*: 03E17, 03E15, **Individual member \$35**, List \$58, Institutional member \$46, Order code MEMO/167/793N

Mathematical Physics



Waves in Periodic and Random Media

Peter Kuchment, *Texas A&M University, College Station*, Editor

Science and engineering have been great sources of problems and inspiration for generations of mathematicians. This is probably true now more than ever as numerous challenges in science and technology are met by mathematicians. One of these challenges is understanding propagation of waves of different nature in systems of complex structure.

This book contains the proceedings of the research conference, "Waves in Periodic and Random Media". Papers are devoted to a number of related themes, including spectral theory of periodic differential operators, Anderson localization and spectral theory of random operators, photonic crystals, waveguide theory, mesoscopic systems, and designer random surfaces. Contributions are written by prominent experts and are of interest to researchers and graduate students in mathematical physics.

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

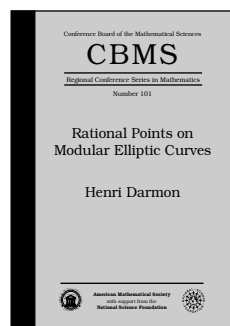
Contents: J. M. Combes, B. Gralak, and A. Tip, Spectral properties of absorptive photonic crystals; J.-M. Combes, P. D. Hislop, and F. Klopp, Regularity properties for the density of states of random Schrödinger operators; P. Exner, Spectral properties of Schrödinger operators with a strongly attractive δ interaction supported by a surface; L. Friedlander,

Absolute continuity of the spectra of periodic waveguides; **F. Germinet** and **A. Klein**, The Anderson metal-insulator transport transition; **S. E. Golowich** and **M. I. Weinstein**, Theory and computation of scattering resonances of photonic microstructures; **Yu. Karpeshina**, Asymptotic formulas for eigenvalues and eigenfunctions of periodic magnetic Schrödinger operators; **P. Kuchment** and **B. Ong**, On guided waves in photonic crystal waveguides; **T. A. Leskova**, **A. A. Maradudin**, **E. R. Méndez**, and **J. Muñoz-Lopez**, The design and photofabrication of random achromatic optical diffusers for uniform illumination; **B. Pavlov** and **K. Robert**, Resonance optical switch: Calculation of resonance eigenvalues; **A. V. Sobolev**, High energy asymptotics of the density of states for certain periodic pseudo-differential operators in dimension one; **T. A. Suslina**, On discrete spectrum in the gaps of a two-dimensional periodic elliptic operator perturbed by a decaying potential; **V. V. Yurinsky**, On the principal eigenvalue of the Schrödinger operator with a scaled random potential.

Contemporary Mathematics, Volume 339

January 2004, 216 pages, Softcover, ISBN 0-8218-3286-7, LC 2003063578, 2000 *Mathematics Subject Classification*: 35Pxx, 35Qxx, 78Axx, 81Qxx, 81Uxx, 81Vxx, 82Dxx, **All AMS members \$47**, List \$59, Order code CONM/339N

Number Theory



Rational Points on Modular Elliptic Curves

Henri Darmon, *McGill University, Montreal, QC, Canada*

The book surveys some recent developments in the arithmetic of modular elliptic curves. It places a special emphasis on the construction of

rational points on elliptic curves, the Birch and Swinnerton-Dyer conjecture, and the crucial role played by modularity in shedding light on these two closely related issues.

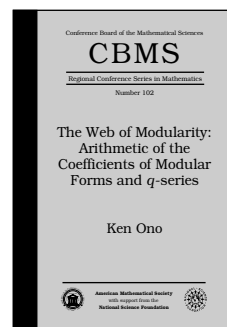
The main theme of the book is the theory of complex multiplication, Heegner points, and some conjectural variants. The first three chapters introduce the background and prerequisites: elliptic curves, modular forms and the Shimura-Taniyama-Weil conjecture, complex multiplication and the Heegner point construction. The next three chapters introduce variants of modular parametrizations in which modular curves are replaced by Shimura curves attached to certain indefinite quaternion algebras. The main new contributions are found in Chapters 7-9, which survey the author's attempts to extend the theory of Heegner points and complex multiplication to situations where the base field is not a CM field. Chapter 10 explains the proof of Kolyvagin's theorem, which relates Heegner points to the arithmetic of elliptic curves and leads to the best evidence so far for the Birch and Swinnerton-Dyer conjecture.

Contents: Elliptic curves; Modular forms; Heegner points on $X_0(N)$; Heegner points on Shimura curves; Rigid analytic

modular forms; Rigid analytic modular parametrizations; Totally real fields; ATR points; Integration on $\mathcal{H}_p \times \mathcal{H}$; Kolyvagin's theorem; Bibliography.

CBMS Regional Conference Series in Mathematics, Number 101

January 2004, 129 pages, Softcover, ISBN 0-8218-2868-1, LC 2003063735; 2000 *Mathematics Subject Classification*: 11G40; 11F67, 11F85, 11G18, 11R37, **All Individuals \$23**, List \$29, Order code CBMS/101N



The Web of Modularity: Arithmetic of the Coefficients of Modular Forms and q -series

Ken Ono, *University of Wisconsin, Madison*

Modular forms appear in many ways in number theory. They play a central role in the theory of quadratic forms, in particular, as generating functions for the number of representations of integers by positive definite quadratic forms. They are also key players in the recent spectacular proof of Fermat's Last Theorem. Modular forms are at the center of an immense amount of current research activity. Also detailed in this volume are other roles that modular forms and q -series play in number theory, such as applications and connections to basic hypergeometric functions, Gaussian hypergeometric functions, super-congruences, Weierstrass points on modular curves, singular moduli, class numbers, L -values, and elliptic curves.

The first three chapters provide some basic facts and results on modular forms, which set the stage for the advanced areas that are treated in the remainder of the book. Ono gives ample motivation on topics where modular forms play a role. Rather than cataloging all of the known results, he highlights those that give their flavor. At the end of most chapters, he gives open problems and questions.

The book is an excellent resource for advanced graduate students and researchers interested in number theory.

Contents: Basic facts; Integer weight modular forms; Half-integral weight modular forms; Product expansions of modular forms on $SL_2(\mathbb{Z})$; Partitions; Weierstrass points on modular curves; Traces of singular moduli and class equations; Class numbers of quadratic fields; Central values of modular L -functions and applications; Basic hypergeometric generating functions for L -values; Gaussian hypergeometric functions; Bibliography; Index.

CBMS Regional Conference Series in Mathematics, Number 102

January 2004, 216 pages, Softcover, ISBN 0-8218-3368-5, 2000 *Mathematics Subject Classification*: 11Fxx, 11Gxx, 11Pxx, 05Axx, **All Individuals \$36**, List \$45, Order code CBMS/102N

More Publications Available from the AMS



Revêtements étales et groupe fondamental (SGA 1)

Séminaire de géométrie algébrique du Bois Marie 1960-61

This volume is a new and updated edition of the book, *Revêtements Étales et Groupe Fondamental*, by Alexander Grothendieck, et al., also

known as SGA 1. It presents foundations of the theory of the fundamental group in algebraic geometry from the Kronecker point of view, allowing one to treat equally the case of an algebraic variety in the usual sense and that of the ring of integers in a number field, for example. This volume is suitable for graduate students and research mathematicians interested in algebraic geometry.

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