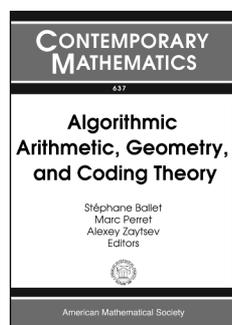


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Algebra and Algebraic Geometry



Algorithmic Arithmetic, Geometry, and Coding Theory

Stéphane Ballet, Aix-Marseille University, France, **Marc Perret**, Université de Toulouse II Le Mirail, France, and **Alexey Zaytsev**, Immanuel Kant Baltic Federal University, Kaliningrad, Russia, Editors

This volume contains the proceedings of the 14th International Conference on Arithmetic, Geometry, Cryptography, and Coding Theory (AGCT), held June 3–7, 2013, at CIRM, Marseille, France.

These international conferences, held every two years, have been a major event in the area of algorithmic and applied arithmetic geometry for more than 20 years.

This volume contains 13 original research articles covering geometric error correcting codes, and algorithmic and explicit arithmetic geometry of curves and higher dimensional varieties. Tools used in these articles include classical algebraic geometry of curves, varieties and Jacobians, Suslin homology, Monsky–Washnitzer cohomology, and L -functions of modular forms.

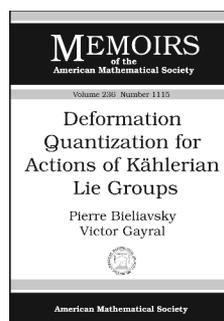
This item will also be of interest to those working in applications.

Contents: *Geometric error correcting codes:* **H. Randriambololona**, On products and powers of linear codes under componentwise multiplication; **M. Datta** and **S. R. Ghorpade**, Higher weights of affine Grassmann codes and their duals; *Algorithmic: Special varieties:* **D. Kohel**, The geometry of efficient arithmetic on elliptic curves; **I. Boyer**, 2-2-2 isogenies between Jacobians of hyperelliptic curves; **B. Smith**, Easy scalar decompositions for efficient scalar multiplication on elliptic curves and genus 2 Jacobians; *Algorithmic: Point counting:* **C. Gonçalves**, A point counting algorithm for cyclic covers of the projective line; **Y.-D. Shieh**, Point counting on non-hyperelliptic genus 3 curves with automorphism group $\mathbb{Z}/2\mathbb{Z}$ using Monsky–Washnitzer cohomology; **M. Q. Kawakita**, Wiman’s and Edge’s sextic attaining Serre’s bound II; *Algorithmic: General:* **J. Guàrdia** and **E. Nart**, Genetics of polynomials over local fields; *Explicit algebraic geometry:* **E. Alekseenko** and **A. Zaytsev**, Explicit

equations of optimal curves of genus 3 over certain finite fields with three parameters; **A. Eid** and **I. Duursma**, Smooth embeddings for the Suzuki and Ree curves; *Arithmetic geometry:* **A. Zykin**, Uniform distribution of zeroes of L -functions of modular forms; **A. Schmidt**, A survey on class field theory for varieties.

Contemporary Mathematics, Volume 637

March 2015, 306 pages, Softcover, ISBN: 978-1-4704-1461-0, LC 2014037646, 2010 *Mathematics Subject Classification*: 11G10, 11G20, 11G25, 11H71, 11Y16, 14G05, 14G15, 14Q05, 14Q15, 94B27, **AMS members US\$84**, List US\$105, Order code CONM/637



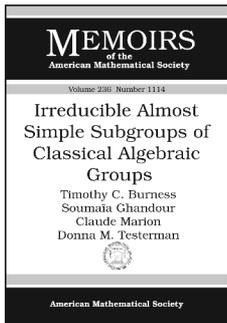
Deformation Quantization for Actions of Kählerian Lie Groups

Pierre Bieliavsky, Université Catholique de Louvain, Louvain la Neuve, Belgium, and **Victor Gayral**, Laboratoire de Mathématiques, Reims, France

Contents: Introduction; Notations and conventions; Oscillatory integrals; Tempered pairs for Kählerian Lie groups; Non-formal star-products; Deformation of Fréchet algebras; Quantization of polarized symplectic symmetric spaces; Quantization of Kählerian Lie groups; Deformation of C^* -algebras; Bibliography.

Memoirs of the American Mathematical Society, Volume 236, Number 1115

June 2015, 154 pages, Softcover, ISBN: 978-1-4704-1491-7, LC 2015007760, 2010 *Mathematics Subject Classification*: 22E30, 46L87, 81R60, 58B34, 81R30, 53C35, 32M15, 53D55, **Individual member US\$51.60**, List US\$86, Institutional member US\$68.80, Order code MEMO/236/1115



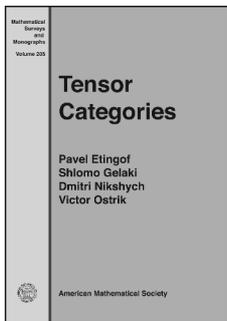
Irreducible Almost Simple Subgroups of Classical Algebraic Groups

Timothy C. Burness, *University of Bristol, United Kingdom*, **Soumaïa Ghandour**, *Lebanese University, Nabatieh, Lebanon*, **Claude Marion**, *University of Fribourg, Switzerland*, and **Donna M. Testerman**, *École Polytechnique Fédérale de Lausanne, Switzerland*

Contents: Introduction; Preliminaries; The case $H^0 = A_m$; The case $H^0 = D_m$, $m \geq 5$; The case $H^0 = E_6$; The case $H^0 = D_4$; Proof of Theorem 5; Notation; Bibliography.

Memoirs of the American Mathematical Society, Volume 236, Number 1114

June 2015, 110 pages, Softcover, ISBN: 978-1-4704-1046-9, LC 2015007756, 2010 *Mathematics Subject Classification*: 20G05; 20E28, 20E32, **Individual member US\$48**, List US\$80, Institutional member US\$64, Order code MEMO/236/1114



Tensor Categories

Pavel Etingof, *Massachusetts Institute of Technology, Cambridge, MA*, **Shlomo Gelaki**, *Technion-Israel Institute of Technology, Haifa, Israel*, **Dmitri Nikshych**, *University of New Hampshire, Durham, NH*, and **Victor Ostrik**, *University of Oregon, Eugene, OR*

Is there a vector space whose dimension is the golden ratio? Of course not—the golden ratio is not an integer! But this can happen for generalizations of vector spaces—objects of a tensor category. The theory of tensor categories is a relatively new field of mathematics that generalizes the theory of group representations. It has deep connections with many other fields, including representation theory, Hopf algebras, operator algebras, low-dimensional topology (in particular, knot theory), homotopy theory, quantum mechanics and field theory, quantum computation, theory of motives, etc. This book gives a systematic introduction to this theory and a review of its applications. While giving a detailed overview of general tensor categories, it focuses especially on the theory of finite tensor categories and fusion categories (in particular, braided and modular ones), and discusses the main results about them with proofs. In particular, it shows how the main properties of finite-dimensional Hopf algebras may be derived from the theory of tensor categories.

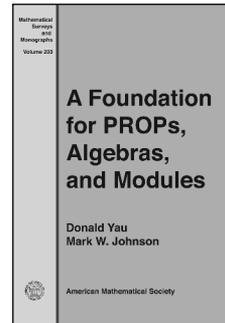
Many important results are presented as a sequence of exercises, which makes the book valuable for students and suitable for graduate courses. Many applications, connections to other areas, additional results, and references are discussed at the end of each chapter.

Contents: Abelian categories; Monoidal categories; \mathbb{Z}_+ -rings; Tensor categories; Representation categories of Hopf algebras; Finite tensor

categories; Module categories; Braided categories; Fusion categories; Bibliography; Index.

Mathematical Surveys and Monographs, Volume 205

July 2015, approximately 350 pages, Hardcover, ISBN: 978-1-4704-2024-6, LC 2015006773, 2010 *Mathematics Subject Classification*: 17B37, 18D10, 19D23, 20G42, **AMS members US\$88**, List US\$110, Order code SURV/205



A Foundation for PROPs, Algebras, and Modules

Donald Yau, *The Ohio State University at Newark, OH*, and **Mark W. Johnson**, *Pennsylvania State University Altoona, PA*

PROPs and their variants are extremely general and powerful machines that encode operations with multiple inputs and multiple outputs. In this respect PROPs can

be viewed as generalizations of operads that would allow only a single output. Variants of PROPs are important in several mathematical fields, including string topology, topological conformal field theory, homotopical algebra, deformation theory, Poisson geometry, and graph cohomology. The purpose of this monograph is to develop, in full technical detail, a unifying object called a generalized PROP. Then with an appropriate choice of pasting scheme, one recovers (colored versions of) dioperads, half-PROPs, (wheeled) operads, (wheeled) properads, and (wheeled) PROPs.

Here the fundamental operation of graph substitution is studied in complete detail for the first time, including all exceptional edges and loops as examples of a new definition of wheeled graphs. A notion of generators and relations is proposed which allows one to build all of the graphs in a given pasting scheme from a small set of basic graphs using graph substitution. This provides information at the level of generalized PROPs, but also at the levels of algebras and of modules over them. Working in the general context of a symmetric monoidal category, the theory applies for both topological spaces and chain complexes in characteristic zero.

This book is useful for all mathematicians and mathematical physicists who want to learn this new powerful technique.

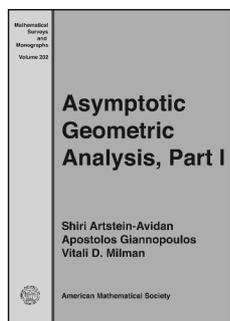
This item will also be of interest to those working in geometry and topology.

Contents: *Wheeled graphs and pasting schemes:* Wheeled graphs; Special sets of graphs; Basic operations on wheeled graphs; Graph groupoids; Graph substitution; Properties of graph substitution; Generators for graphs; Pasting schemes; Well-matched pasting schemes; *Generalized PROPs, algebras, and modules:* Generalized PROPs; Biased characterizations of generalized PROPs; Functors of generalized PROPs; Algebras over generalized PROPs; Alternative descriptions of generalized PROPs; Modules over generalized PROPs; May modules over algebras over operads; Bibliography; Index.

Mathematical Surveys and Monographs, Volume 203

July 2015, 311 pages, Hardcover, ISBN: 978-1-4704-2197-7, LC 2014049153, 2010 *Mathematics Subject Classification*: 18D99; 55U40, 13D10, 81T30, **AMS members US\$88**, List US\$110, Order code SURV/203

Analysis



Asymptotic Geometric Analysis, Part I

Shiri Artstein-Avidan, *Tel Aviv University, Israel*, **Apostolos Giannopoulos**, *University of Athens, Greece*, and **Vitali D. Milman**, *Tel Aviv University, Israel*

The authors present the theory of asymptotic geometric analysis, a field which lies on the border between geometry and functional analysis. In this field, isometric problems that are typical for geometry in low dimensions are substituted by an “isomorphic” point of view, and an asymptotic approach (as dimension tends to infinity) is introduced. Geometry and analysis meet here in a non-trivial way. Basic examples of geometric inequalities in isomorphic form which are encountered in the book are the “isomorphic isoperimetric inequalities” which led to the discovery of the “concentration phenomenon”, one of the most powerful tools of the theory, responsible for many counterintuitive results.

A central theme in this book is the interaction of randomness and pattern. At first glance, life in high dimension seems to mean the existence of multiple “possibilities”, so one may expect an increase in the diversity and complexity as dimension increases. However, the concentration of measure and effects caused by convexity show that this diversity is compensated and order and patterns are created for arbitrary convex bodies in the mixture caused by high dimensionality.

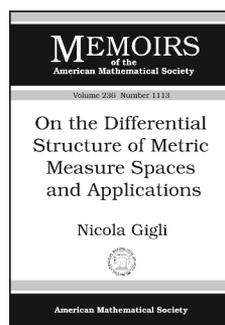
The book is intended for graduate students and researchers who want to learn about this exciting subject. Among the topics covered in the book are convexity, concentration phenomena, covering numbers, Dvoretzky-type theorems, volume distribution in convex bodies, and more.

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

Contents: Convex bodies: Classical geometric inequalities; Classical positions of convex bodies; Isomorphic isoperimetric inequalities and concentration of measure; Metric entropy and covering numbers estimates; Almost Euclidean subspaces of finite dimensional normed spaces; The ℓ -position and the Rademacher projection; Proportional theory; M -position and the reverse Brunn-Minkowski inequality; Gaussian approach; Volume distribution in convex bodies; Elementary convexity; Advanced convexity; Bibliography; Subject index; Author index.

Mathematical Surveys and Monographs, Volume 202

June 2015, 451 pages, Hardcover, ISBN: 978-1-4704-2193-9, LC 2014049152, 2010 *Mathematics Subject Classification*: 52Axx, 46Bxx, 60Dxx, 28Axx, 46B20, 46B09, 52A20, 52A21, 52A23, 68-02, **AMS members US\$88**, List US\$110, Order code SURV/202



On the Differential Structure of Metric Measure Spaces and Applications

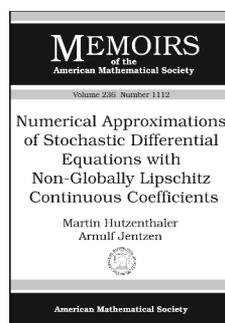
Nicola Gigli, *University of Bordeaux 1, France*

Contents: Introduction; Preliminaries; Differentials and gradients; Laplacian; Comparison estimates; Appendix A. On the

duality between cotangent and tangent spaces; Appendix B. Remarks about the definition of the Sobolev classes; References.

Memoirs of the American Mathematical Society, Volume 236, Number 1113

June 2015, 91 pages, Softcover, ISBN: 978-1-4704-1420-7, LC 2015007762, **Individual member US\$45.60**, List US\$76, Institutional member US\$60.80, Order code MEMO/236/1113



Numerical Approximations of Stochastic Differential Equations with Non-Globally Lipschitz Continuous Coefficients

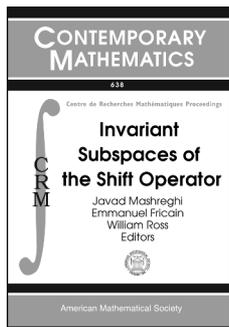
Martin Hutzenthaler, *University of Duisburg-Essen, North Rhine-Westphalia, Germany*, and **Arnulf Jentzen**, *ETH Zurich, Switzerland*

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

Contents: Introduction; Integrability properties of approximation processes for SDEs; Convergence properties of approximation processes for SDEs; Examples of SDEs; Bibliography.

Memoirs of the American Mathematical Society, Volume 236, Number 1112

June 2015, 99 pages, Softcover, ISBN: 978-1-4704-0984-5, LC 2015007761, 2010 *Mathematics Subject Classification*: 60H35; 65C05, 65C30, **Individual member US\$45.60**, List US\$76, Institutional member US\$60.80, Order code MEMO/236/1112



Invariant Subspaces of the Shift Operator

Javad Mashreghi, *Laval University, Quebec, Canada*, **Emmanuel Fricain**, *Université Lille 1, Villeneuve d'Ascq, France*, and **William Ross**, *University of Richmond, VA*, Editors

This volume contains the proceedings of the CRM Workshop on Invariant Subspaces

of the Shift Operator, held August 26–30, 2013, at the Centre de Recherches Mathématiques, Université de Montréal, Montréal, Quebec, Canada.

The main theme of this volume is the invariant subspaces of the shift operator (or its adjoint) on certain function spaces, in particular, the Hardy space, Dirichlet space, and de Branges–Rovnyak spaces.

These spaces, and the action of the shift operator on them, have turned out to be a precious tool in various questions in analysis such as function theory (Bieberbach conjecture, rigid functions, Schwarz–Pick inequalities), operator theory (invariant subspace problem, composition operator), and systems and control theory.

Of particular interest is the Dirichlet space, which is one of the classical Hilbert spaces of holomorphic functions on the unit disk. From many points of view, the Dirichlet space is an interesting and challenging example of a function space. Though much is known about it, several important open problems remain, most notably the characterization of its zero sets and of its shift-invariant subspaces.

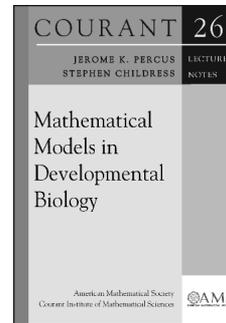
This book is co-published with the Centre de Recherches Mathématiques.

Contents: **H. Queffélec**, Approximation numbers of composition operators on a Hilbert space of Dirichlet series; **D. Timotin**, A short introduction to de Branges–Rovnyak spaces; **C. Chu**, Asymptotic Bohr radius for the polynomials in one complex variable; **A. Bourhim** and **J. Mashreghi**, A survey on preservers of spectra and local spectra; **C. C. Cowen** and **R. G. Wahl**, Commutants of finite Blaschke product multiplication operators; **P. M. Gauthier**, Complex approximation and extension-interpolation on arbitrary sets in one dimension; **E. Fricain**, **J. Mashreghi**, and **D. Seco**, Cyclicity in non-extreme de Branges–Rovnyak spaces; **E. Fricain** and **J. Mashreghi**, Integral representations of the derivatives in $\mathcal{H}(b)$ spaces; **A. Boivin** and **C. Zhu**, Interpolation and moment in weighted Hardy spaces; **S. R. Garcia** and **W. T. Ross**, Model spaces: A survey; **D. Timotin**, Note on a Julia operator related to model spaces; **C. Bénéteau** and **D. Khavinson**, Selected problems in classical function theory; **K. Bickel**, **E. T. Sawyer**, and **B. D. Wick**, The linear bound for Haar multiplier paraproductions; **R. G. Douglas** and **A. Xu**, Transitivity and bundle shifts; **V. V. Andreev** and **J. A. Cima**, Weak H^1 , the real and complex case.

Contemporary Mathematics, Volume 638

April 2015, 317 pages, Softcover, ISBN: 978-1-4704-1045-2, LC 2014038149, 2010 *Mathematics Subject Classification*: 47-XX, 30-XX, 31-XX, 32-XX, **AMS members US\$84**, List US\$105, Order code CONM/638

Applications



Mathematical Models in Developmental Biology

Jerome K. Percus and **Stephen Childress**, *New York University, Courant Institute of Mathematical Sciences, NY*

The path from relatively unstructured egg to full organism is one of the most fascinating trajectories in the biological sciences. Its complexity calls for a very high

level of organization, with an array of subprocesses in constant communication with each other. These notes introduce an interleaved set of mathematical models representative of research in the last few decades, as well as the techniques that have been developed for their solution. Such models offer an effective way of incorporating reliable data in a concise form, provide an approach complementary to the techniques of molecular biology, and help to inform and direct future research.

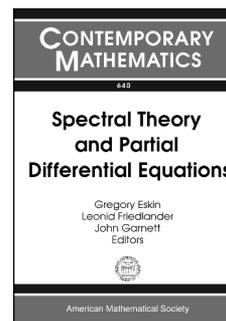
Titles in this series are co-published with the Courant Institute of Mathematical Sciences at New York University.

Contents: Introduction; Catastrophe theory; Pattern formation; Differential adhesion and morphogenesis; The origins of movement; Chemotaxis; Cell proliferation; Somite formation in vertebrates; Compartments; Segmentation of insect embryos; Supplementary notes; Bibliography; Index.

Courant Lecture Notes, Volume 26

July 2015, 249 pages, Softcover, ISBN: 978-1-4704-1080-3, LC 2015004198, 2010 *Mathematics Subject Classification*: 92C10, 92C15, 92C17, 92C45, **AMS members US\$35.20**, List US\$44, Order code CLN/26

Differential Equations



Spectral Theory and Partial Differential Equations

Gregory Eskin, *University of California, Los Angeles, CA*, **Leonid Friedlander**, *University of Arizona, Tucson, AZ*, and **John Garnett**, *University of California, Los Angeles, CA*, Editors

This volume contains the proceedings of the Conference on Spectral Theory and Partial Differential Equations, held from June 17–21, 2013, at the University of California, Los Angeles, California, in honor of James Ralston's 70th Birthday.

Papers in this volume cover important topics in spectral theory and partial differential equations such as inverse problems, both

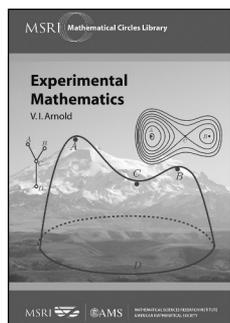
analytical and algebraic; minimal partitions and Pleijel's Theorem; spectral theory for a model in Quantum Field Theory; and beams on Zoll manifolds.

Contents: **M. I. Belishev**, Algebras in reconstruction of manifolds; **J.-C. Guillot**, Spectral theory of a mathematical model in quantum field theory for any spin; **B. Helffer** and **T. Hoffmann-Ostenhof**, A review on large k minimal spectral k -partitions and Pleijel's theorem; **V. Isakov**, Increasing stability for near field from the scattering amplitude; **H. Isozaki**, **Y. Kurylev**, and **M. Lassas**, Inverse scattering on multi-dimensional asymptotically hyperbolic orbifolds; **H. Liu** and **M. Pryporov**, Error estimates of the Bloch band-based Gaussian beam superposition for the Schrödinger equation; **D. Robert** and **L. Thomann**, On random weighted Sobolev inequalities on \mathbb{R}^4 and applications; **O. Y. Imanuvilov** and **M. Yamamoto**, Calderón problem for Maxwell's equations in the waveguide; **S. Zelditch**, Gaussian beams on Zoll manifolds and maximally degenerate Laplacians.

Contemporary Mathematics, Volume 640

June 2015, 197 pages, Softcover, ISBN: 978-1-4704-0989-0, LC 2014040087, 2010 *Mathematics Subject Classification*: 35-06, **AMS members US\$84**, List US\$105, Order code CONM/640

Discrete Mathematics and Combinatorics



Experimental Mathematics

V. I. Arnold

Translated by Dmitry Fuchs and Mark Saul.

One of the traditional ways mathematical ideas and even new areas of mathematics are created is from experiments. One of the best-known examples is that of the Fermat hypothesis, which was conjectured

by Fermat in his attempts to find integer solutions for the famous Fermat equation. This hypothesis led to the creation of a whole field of knowledge, but it was proved only after several hundred years.

This book, based on the author's lectures, presents several new directions of mathematical research. All of these directions are based on numerical experiments conducted by the author, which led to new hypotheses that currently remain open, i.e., are neither proved nor disproved. The hypotheses range from geometry and topology (statistics of plane curves and smooth functions) to combinatorics (combinatorial complexity and random permutations) to algebra and number theory (continuous fractions and Galois groups). For each subject, the author describes the problem and presents numerical results that led him to a particular conjecture. In the majority of cases there is an indication of how the readers can approach the formulated conjectures (at least by conducting more numerical experiments).

Written in Arnold's unique style, the book is intended for a wide range of mathematicians, from high school students interested in exploring unusual areas of mathematics on their own, to college and graduate students, to researchers interested in gaining a new, somewhat nontraditional perspective on doing mathematics.

In the interest of fostering a greater awareness and appreciation of mathematics and its connections to other disciplines and everyday

life, MSRI and the AMS are publishing books in the Mathematical Circles Library series as a service to young people, their parents and teachers, and the mathematics profession.

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

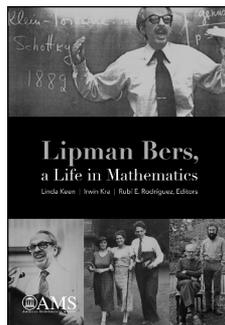
Titles in this series are co-published with the Mathematical Sciences Research Institute (MSRI).

Contents: Introduction; The statistics of topology and algebra; Combinatorial complexity and randomness; Random permutations of Young diagrams of their cycles; The geometry of Frobenius numbers for additive semigroups; Bibliography.

MSRI Mathematical Circles Library, Volume 16

August 2015, approximately 165 pages, Softcover, ISBN: 978-0-8218-9416-3, LC 2015009318, 2010 *Mathematics Subject Classification*: 00A05; 34C07, 68Q17, 20B30, 11P99, **Individual member US\$21.75**, **All Individuals US\$21.75**, List US\$29, Institutional member US\$23.20, Order code MCL/16

General Interest



Lipman Bers, a Life in Mathematics

Linda Keen, *Lehman College, CUNY, New York, NY*, **Irwin Kra**, *Stony Brook University, NY*, and **Rubí E. Rodríguez**, *Pontificia Universidad Católica de Chile, Santiago, Chile*, Editors

The book is part biography and part collection of mathematical essays

that gives the reader a perspective on the evolution of an interesting mathematical life. It is all about Lipman Bers, a giant in the mathematical world who lived in turbulent and exciting times. It captures the essence of his mathematics, a development and transition from applied mathematics to complex analysis—quasiconformal mappings and moduli of Riemann surfaces—and the essence of his personality, a progression from a young revolutionary refugee to an elder statesman in the world of mathematics and a fighter for global human rights and the end of political torture.

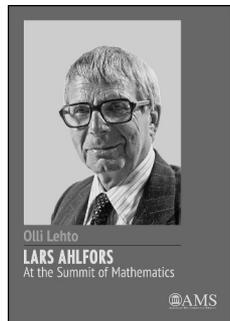
The book contains autobiographical material and short reprints of his work. The main content is in the exposition of his research contributions, sometimes with novel points of view, by students, grand-students, and colleagues. The research described was fundamental to the growth of a central part of 20th century mathematics that, now in the 21st century, is in a healthy state with much current interest and activity. The addition of personal recollections, professional tributes, and photographs yields a picture of a man, his personal and professional family, and his time.

Contents: **L. Bers**, **R. Shapiro**, and **V. Bers**, Pages from a memoir; **L. Nirenberg**, Lipman Bers and partial differential equations; **W. Abikoff** and **R. J. Sibner**, Bers—From graduate student to quasiconformal mapper; **S. A. Wolpert**, Measurable Riemann mappings; **A. Marden**, The Ahlfors-Bers creation of the modern theory of Kleinian groups—A small acorn grows to a mighty oak; **I. Kra** and **B. Maskit**, The Bers embedding and (some of) its ramifications;

Geometry and Topology

F. P. Gardiner and L. Keen, Lipman Bers, a retrospective; G. Riera and R. E. Rodríguez, The Weil-Petersson geometry of a family of Riemann surfaces; H. Masur, Legacy of work of Bers on the mapping class group; A. Basmajian and P. Susskind, Bers' pants decomposition theorem; I. Kra, Dennis Sullivan and Jeremy Kahn reminiscences; Y. Minsky, Bers embeddings, skinning maps and hyperbolic geometry; N. A'Campo, L. Ji, and A. Papadopoulos, On the early history of moduli and Teichmüller spaces; L. Bers, Correction to "Spaces of Riemann surfaces as bounded domains"; L. Bers, The migration of European mathematicians to America; I. Kra and H. Bass, Lipman Bers May 22, 1914–October 29, 1993; C. S. Morawetz, C. Corillon, I. Kra, T. Weinstein, and J. Gilman, Remembering Lipman Bers; L. Keen, T. K. Milnor, L. Sibner, I. Kra, J. Gilman, and J. Dodziuk, Lipman Bers, a mathematical mentor; L. Keen, I. Kra, and R. E. Rodríguez, Doctoral students of Lipman Bers; L. Keen, I. Kra, and R. E. Rodríguez, Publications of Lipman Bers.

September 2015, approximately 323 pages, Softcover, ISBN: 978-1-4704-2056-7, LC 2015007926, 2010 *Mathematics Subject Classification*: 01-02, 01A55, 01A60, 30-02, 30-03, 30F10, 30F40, 30F60, **AMS members US\$35.20**, List US\$44, Order code MBK/93



Lars Ahlfors—At the Summit of Mathematics

Olli Lehto, *University of Helsinki, Finland*

Translated by William Hellberg

This book tells the story of the Finnish-American mathematician Lars Ahlfors (1907–1996). He was educated at the University of Helsinki as a student of Ernst Lindelöf and Rolf Nevanlinna and

later became a professor there. He left Finland permanently in 1944 and was professor and emeritus at Harvard University for more than fifty years.

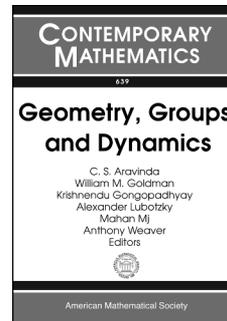
Already at the age of twenty-one Ahlfors became a well-known mathematician having solved Denjoy's conjecture, and in 1936 he established his world renown when he was awarded the Fields Medal, the "Nobel Prize in mathematics". In this book the description of his mathematics avoids technical details and concentrates on his contributions to the general development of complex analysis.

Besides mathematics there is also a lot to tell about Ahlfors. World War II marked his life, and he was a colorful personality, with many interesting stories about him.

Olli Lehto, the author of the book, first met Lars Ahlfors and his family as a young doctor at Harvard in 1950. Numerous meetings after that in various parts of the world led to a close friendship between them.

Contents: Family background; Exceptional talent emerges; Mathematical renown secured; To America and back again; War years in Finland; In Sweden and Switzerland; Professorship at Harvard University; The legacy of Riemann and Teichmüller; New research and return to the old; Distinctions; Additions to the portrait; Epilogue in Finland; Sources; Index.

July 2015, 125 pages, Softcover, ISBN: 978-1-4704-1846-5, LC 2015006617, 2010 *Mathematics Subject Classification*: 01-XX, **AMS members US\$31.20**, List US\$39, Order code MBK/92



Geometry, Groups and Dynamics

C. S. Aravinda, *TIFR, Bangalore, India*, William M. Goldman, *University of Maryland, College Park, MD*, Krishnendu Gongopadhyay, *Indian Institute of Science Education and Research Mohali, Punjab, India*, Alexander Lubotzky, *Hebrew University of Jerusalem, Israel*, Mahan Mj, *RKM Vivekananda University, Howrah, India*, and Anthony Weaver, *Bronx Community College, CUNY, New York, NY*, Editors

This volume contains the proceedings of the ICTS Program: Groups, Geometry and Dynamics, held December 3–16, 2012, at CEMS, Almora, India. The activity was an academic tribute to Ravi S. Kulkarni on his turning seventy.

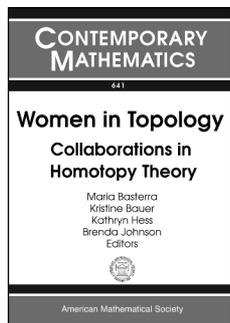
Articles included in this volume, both introductory and advanced surveys, represent the broad area of geometry that encompasses a large portion of group theory (finite or otherwise) and dynamics in its proximity. These areas have been influenced by Kulkarni's ideas and are closely related to his work and contribution.

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

Contents: W. Barrera, A. Cano, J. P. Navarrete, and J. Seade, Complex Kleinian groups; V. Charette and T. A. Drumm, Complete Lorentzian 3-manifolds; M. Chas, The Goldman bracket and the intersection of curves on surfaces; S. G. Dani, An introduction to flows on homogeneous spaces; P. B. Shalen, Quantitative geometry of hyperbolic manifolds; A. Weaver, Discrete groups and Riemann surfaces; V. T. Aithal, A note on Chern's theorem on invariant measures; J. S. Athreya, Random affine lattices; V. G. Bardakov and M. V. Neshchadim, Upper central series for the group of unimodular automorphisms of a free associative algebra; I. Biswas, Hermitian structure and bundles on G/Γ ; K. Biswas and R. Perez-Marco, Log-Riemann surfaces, Caratheodory convergence and Euler's formula; K. Biswas and R. Perez-Marco, Uniformization of simply connected finite type log-Riemann surfaces; A. L. Edmonds, The Euler characteristic of a Haken 4-manifold; V. Erlandsson and S. Zakeri, A discreteness criterion for groups containing parabolic isometries; R. Gouraige, On the z -classes in a centrally finite division ring; F. Guéritaud, On Lorentz spacetimes of constant curvature; S. Gupta, On the asymptotic behavior of complex earthquakes and Teichmüller disks; G. A. Jones, Characteristically simple Beauville groups, I: Cartesian powers of alternating groups; A. Pal and A. K. Singh, Relatively hyperbolic spaces; J. R. Parker and P. Will, Complex hyperbolic free groups with many parabolic elements; T. Nayak, On Fatou components and omitted values; S. Yuan, Some dynamical properties of certain meromorphic functions.

Contemporary Mathematics, Volume 639

April 2015, 369 pages, Softcover, ISBN: 978-0-8218-9882-6, LC 2014040086, 2010 *Mathematics Subject Classification*: 51Mxx, 32-XX, 20-XX, **AMS members US\$84**, List US\$105, Order code CONM/639



Women in Topology

Collaborations in Homotopy Theory

Maria Basterra, *University of New Hampshire, Durham, NH*, **Kristine Bauer**, *University of Calgary, Alberta, Canada*, **Kathryn Hess**, *Ecole Polytechnique Fédérale de Lausanne, Switzerland*, and **Brenda Johnson**, *Union College, Schenectady, NY*, Editors

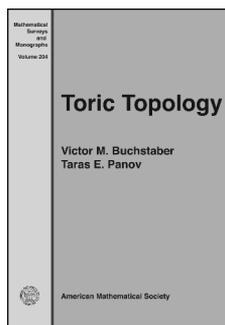
This volume contains the proceedings of the WIT: Women in Topology workshop, held from August 18–23, 2013, at the Banff International Research Station, Banff, Alberta, Canada. The Women in Topology workshop was devoted primarily to active collaboration by teams of five to seven participants, each including senior and junior researchers, as well as graduate students.

This volume contains papers based on the results obtained by team projects in homotopy theory, including A -infinity structures, equivariant homotopy theory, functor calculus, model categories, orbispaces, and topological Hochschild homology.

Contents: C. I. Aponte Román, M. Livernet, M. Robertson, S. Whitehouse, and S. Ziegenhagen, Representations of derived A -infinity algebras; M. Basterra, K. Bauer, A. Beaudry, R. Eldred, B. Johnson, M. Merling, and S. Yeakel, Unbased calculus for functors to chain complexes; M. Bayeh, K. Hess, V. Karpova, M. Kędziorek, E. Riehl, and B. Shipley, Left-induced model structures and diagram categories; J. E. Bergner, R. Joachimi, K. Lesh, V. Stojanoska, and K. Wickelgren, Fixed points of p -toral groups acting on partition complexes; I. Bobkova, A. Lindenstrauss, K. Poirier, B. Richter, and I. Zakharevich, On the higher topological Hochschild homology of \mathbb{F}_p and commutative \mathbb{F}_p -group algebras; A. M. Bohmann, K. Mazur, A. M. Osorno, V. Ozornova, K. Ponto, and C. Yarnall, A model structure on $GCat$; V. Coufal, D. Pronk, C. Rovi, L. Scull, and C. Thatcher, Orbispaces and their mapping spaces via groupoids: A categorical approach.

Contemporary Mathematics, Volume 641

June 2015, 166 pages, Softcover, ISBN: 978-1-4704-1013-1, LC 2014046384, 2010 *Mathematics Subject Classification*: 18D50, 18G55, 18G60, 22A22, 55N91, 55P91, 55U15, 55U35, 57R18, **AMS members US\$84**, List US\$105, Order code CONM/641



Toric Topology

Victor M. Buchstaber, *Steklov Mathematical Institute, Moscow, Russia*, and **Taras E. Panov**, *Moscow State University, Russia*

This book is about toric topology, a new area of mathematics that emerged at the end of the 1990s on the border of equivariant topology, algebraic and symplectic geometry, combinatorics, and commutative algebra. It has quickly grown into a very active area with many links to other areas of mathematics, and continues to attract experts from different fields.

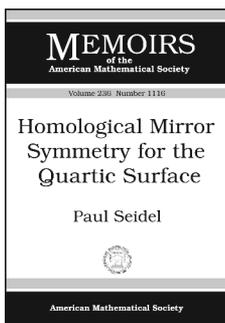
The key players in toric topology are moment-angle manifolds, a class of manifolds with torus actions defined in combinatorial terms. Construction of moment-angle manifolds relates to combinatorial geometry and algebraic geometry of toric varieties via the notion of a quasitoric manifold. Discovery of remarkable geometric structures on moment-angle manifolds led to important connections with classical and modern areas of symplectic, Lagrangian, and non-Kähler complex geometry. A related categorical construction of moment-angle complexes and polyhedral products provides for a universal framework for many fundamental constructions of homotopical topology. The study of polyhedral products is now evolving into a separate subject of homotopy theory. A new perspective on torus actions has also contributed to the development of classical areas of algebraic topology, such as complex cobordism.

This book includes many open problems and is addressed to experts interested in new ideas linking all the subjects involved, as well as to graduate students and young researchers ready to enter this beautiful new area.

Contents: Geometry and combinatorics of polytopes; Combinatorial structures; Combinatorial algebra of face rings; Moment-angle complexes; Toric varieties and manifolds; Geometric structures on moment-angle manifolds; Half-dimensional torus actions; Homotopy theory of polyhedral products; Torus actions and complex cobordism; Commutative and homological algebra; Algebraic topology; Categorical constructions; Bordism and cobordism; Formal group laws and Hirzebruch genera; Bibliography; Index.

Mathematical Surveys and Monographs, Volume 204

July 2015, approximately 523 pages, Hardcover, ISBN: 978-1-4704-2214-1, LC 2015006771, 2010 *Mathematics Subject Classification*: 13F55, 14M25, 32Q55, 52B05, 53D12, 55N22, 55N91, 55Q15, 57R85, 57R91, **AMS members US\$88**, List US\$110, Order code SURV/204



Homological Mirror Symmetry for the Quartic Surface

Paul Seidel, *Massachusetts Institute of Technology, Cambridge, MA*

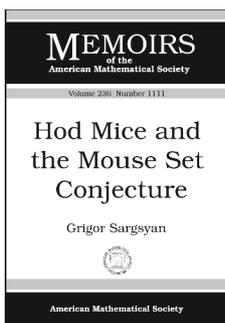
Contents: Introduction; A_∞ -categories; Deformation theory; Group actions; Coherent sheaves; Symplectic terminology; Monodromy and negativity; Fukaya

categories; Computations in Fukaya categories; The algebras Q_4 and Q_{64} ; Counting polygons; References.

Memoirs of the American Mathematical Society, Volume 236, Number 1116

June 2015, 129 pages, Softcover, ISBN: 978-1-4704-1097-1, LC 2015007757, 2010 *Mathematics Subject Classification*: 53D37; 14D05, 18E30, **Individual member US\$48.60**, List US\$81, Institutional member US\$64.80, Order code MEMO/236/1116

Logic and Foundations



Hod Mice and the Mouse Set Conjecture

Grigor Sargsyan, *Rutgers University, Piscataway, NJ*

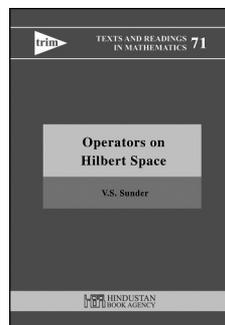
Contents: Introduction; Hod mice; Comparison theory of Hod mice; Hod mice revisited; Analysis of HOD; Hod pair constructions; A proof of the mouse set conjecture; Appendix A. Descriptive set theory primer; Index; Bibliography.

Memoirs of the American Mathematical Society, Volume 236, Number 1111

June 2015, 171 pages, Softcover, ISBN: 978-1-4704-1692-8, LC 2015007758, 2010 *Mathematics Subject Classification*: 03E15, 03E45, 03E60, **Individual member US\$53.40**, List US\$89, Institutional member US\$71.20, Order code MEMO/236/1111

New AMS-Distributed Publications

Analysis



Operators on Hilbert Space

V. S. Sunder, *Institute of Mathematical Sciences, Chennai, India*

This book's principal goals are: (i) to present the spectral theorem as a statement on the existence of a unique continuous and measurable functional calculus, (ii) to present a proof without digressing into a

course on the Gelfand theory of commutative Banach algebras, (iii) to introduce the reader to the basic facts concerning the various von Neumann-Schatten ideals, the compact operators, the trace-class operators and all bounded operators, and finally, (iv) to serve as a primer on the theory of bounded linear operators on separable Hilbert space.

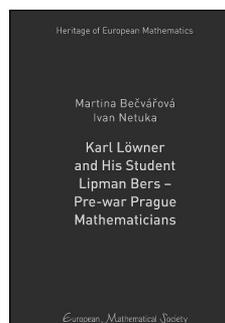
A publication of Hindustan Book Agency; distributed within the Americas by the American Mathematical Society. Maximum discount of 20% for all commercial channels.

Contents: Hilbert space; The spectral theorem; Beyond normal operators; Appendix; Bibliography; Index.

Hindustan Book Agency

May 2015, 110 pages, Softcover, ISBN: 978-93-80250-74-8, 2010 *Mathematics Subject Classification*: 47-01, **AMS members US\$32**, List US\$40, Order code HIN/69

General Interest



Karl Löwner and His Student Lipman Bers—Pre-war Prague Mathematicians

Martina Bečvářová and Ivan Netuka, *Charles University, Prague, Czech Republic*

This monograph is devoted to two distinguished mathematicians, Karl Löwner (1893–1968) and Lipman Bers (1914–1993), whose lives are dramatically interlinked with key historical events of the 20th century. Karl Löwner, Professor of Mathematics at the German University in

Prague (Czechoslovakia), was dismissed from his position because he was a Jew, and emigrated to the USA in 1939 (where he changed his name to Charles Loewner). Earlier, he had published several outstanding papers in complex analysis and a masterpiece on matrix functions. In particular, his groundbreaking parametric method in geometric function theory from 1923, which led to Löwner's celebrated differential equation, brought him worldwide fame and turned out to be a cornerstone in de Branges' proof of the Bieberbach conjecture.

Unexpectedly, Löwner's differential equation has gained recent prominence with the introduction of a conformally invariant stochastic process called stochastic Loewner evolution (SLE) by O. Schramm in 2000. SLE features in two Fields Medal citations from 2006 and 2010. Lipman Bers was the final Prague Ph.D. student of Löwner. His dissertation on potential theory (1938), completed shortly before his emigration and long thought to be irretrievably lost, was found in 2006. It is made accessible here for the first time, with an extensive commentary, to the mathematical community.

This monograph presents an in-depth account of the lives of both mathematicians, with special emphasis on the pre-war period. Löwner's teaching activities and professional achievements are presented in the context of the prevailing complex political situation and against the background of the wider development of mathematics in Europe. Each of his publications is accompanied by an extensive commentary, tracing the origin and motivation of the problem studied, and describing the state-of-art at the time of the corresponding mathematical field. Special attention is paid to the impact of the results obtained and to the later development of the underlying ideas, thus connecting Löwner's achievements to current research activity. The text is based on an extensive archival search, and most of the archival findings appear here for the first time.

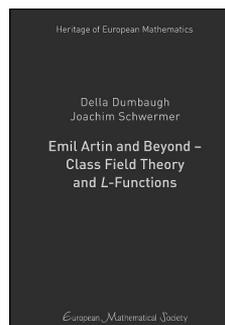
This item will also be of interest to those working in number theory.

A publication of the European Mathematical Society (EMS). Distributed within the Americas by the American Mathematical Society.

Contents: Brief overview of Karl Löwner's life; Karl Löwner: Distinguished teacher and scholar; Publications of Karl Löwner before 1939; Bibliography of Karl Löwner; List of reviews by Karl Löwner; Lecture courses and seminars attended by Karl Löwner; Lecture courses and seminars delivered by Karl Löwner; Karl Löwner and dissertations at the German University in Prague; Karl Löwner lectures to the mathematical community; Brief overview of Lipman Bers' life; Lipman Bers: The final doctoral student of Löwner in Prague; L. Bers' dissertation on potential theory; Harmonisches Maß im Raume; Karl Löwner and Lipman Bers according to Marian Tracy's memory; Karl Löwner and Lipman Bers: Ruth Bers Shapiro recalls their friendship; Name index; Subject index.

Heritage of European Mathematics, Volume 10

April 2015, 310 pages, Hardcover, ISBN: 978-3-03719-144-6, 2010 *Mathematics Subject Classification:* 01A60, 01A70, 11R37, 11R39, 11S37, 11Fxx, 11Mxx, **AMS members US\$65.60**, List US\$82, Order code EMSHEM/10



**Emil Artin and Beyond—
Class Field Theory and
L-Functions**

Della Dumbaugh, and Joachim Schwermer, University of Vienna, Austria

This book explores the development of number theory, and class field theory in particular, as it passed through the hands of Emil Artin, Claude Chevalley, and Robert Langlands in the middle of the twentieth century.

The volume consists of individual essays by the authors and two contributors, James Cogdell and Robert Langlands, and contains relevant archival material. Among these, the letter from Claude Chevalley to Helmut Hasse in 1935 is included, in which he introduces the notion of ideles and explores their significance, along with the previously unpublished thesis by Margaret Matchett and the seminal letter of Robert Langlands to André Weil of 1967 in which he lays out his ideas regarding a non-abelian class field theory. Taken together, these chapters offer a view of both the life of Artin in the 1930s and 1940s and the development of class field theory at that time. They also provide insight into the transmission of mathematical ideas, the careful steps required to preserve a life in mathematics at a difficult moment in history, and the interplay between mathematics and politics (in more ways than one).

Some of the technical points in this volume require a sophisticated understanding of algebra and number theory. The broader topics, however, will appeal to a wider audience that extends beyond mathematicians and historians of mathematics to include historically minded individuals, particularly those with an interest in the time period.

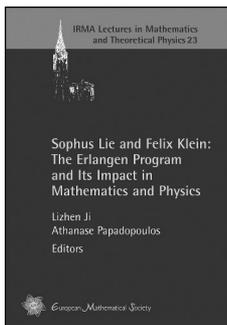
This item will also be of interest to those working in number theory.

A publication of the European Mathematical Society (EMS). Distributed within the Americas by the American Mathematical Society.

Contents: *I. Class field theory: From Artin's course in Hamburg to Chevalley's "Éléments idéaux:* Claude Chevalley's thesis on class field theory and his notion of "Éléments idéaux; Introduction; Letter from Claude Chevalley to Helmut Hasse, June 20, 1935; Letter from Helmut Hasse to Claude Chevalley, June 28, 1935; *II. Creating a life: Emil Artin in America:* Emigration, immigration and pre-remigration; Introduction; Letter from Solomon Lefschetz to Father John O'Hara, January 12, 1937; *III. The collaboration of Emil Artin and George Whaples:* The work of Artin and Whaples—A conceptual breakthrough in algebraic number theory; Introduction; George Whaples' application to the Institute for Advanced Study, School of Mathematics, Princeton, NJ, February 10, 1941; *IV. Margaret Matchett: Artin's student at Indiana and her thesis:* Margaret Matchett and her thesis "On the zeta function for ideles"; Introduction; Margaret Matchett's doctoral dissertation "On the zeta function for ideles"; *V. L-functions by James W. Cogdell:* L-functions and non-abelian class field theory, from Artin to Langlands; *VI. Automorphic L-functions by Robert P. Langlands:* Letter from Robert Langlands to André Weil, January 1967; Funktorialität in der Theorie der automorphen Formen: Ihre Entdeckung und ihre Ziele; Einführung; Bibliography; Index.

Heritage of European Mathematics, Volume 9

March 2015, 245 pages, Hardcover, ISBN: 978-3-03719-146-0, 2010 *Mathematics Subject Classification:* 01A60, 01A70, 11R37, 11R39, 11S37, 11Fxx, 11Mxx, **AMS members US\$60.80**, List US\$76, Order code EMSHEM/9



Sophus Lie and Felix Klein: The Erlangen Program and Its Impact in Mathematics and Physics

Lizhen Ji, *University of Michigan, Ann Arbor*, and Athanase Papadopoulos, *Université de Strasbourg, France*, Editors

The Erlangen program expresses a fundamental point of view on the use of groups and transformation groups in mathematics and physics. This volume is the first modern comprehensive book on that program and its impact in contemporary mathematics and physics. Klein spelled out the program, and Lie, who contributed to its formulation, is the first mathematician who made it effective in his work. The theories that these two authors developed are also linked to their personal history and to their relations with each other and with other mathematicians, including Hermann Weyl, Élie Cartan, Henri Poincaré, and many others. All these facets of the Erlangen program appear in this volume. The book is written by well-known experts in geometry, physics and the history of mathematics and physics.

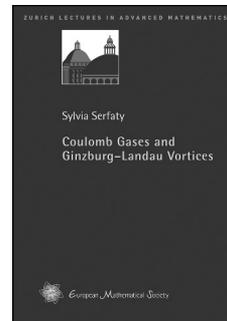
A publication of the European Mathematical Society. Distributed within the Americas by the American Mathematical Society.

Contents: L. Ji, Sophus Lie, A giant in mathematics; L. Ji, Felix Klein: His life and mathematics; J. J. Gray, Klein and the Erlangen Programme; H. Goenner, Klein's "Erlanger Programme": Do traces of it exist in physical theories?; N. A'Campo and A. Papadopoulos, On Klein's so-called non-Euclidean geometry; A. Vinogradov, What are symmetries of PDEs and what are PDEs themselves?; C. Frances, Transformation groups in non-Riemannian geometry; N. A'Campo and A. Papadopoulos, Transitional geometry; A. Papadopoulos and S. Yamada, On the projective geometry of constant curvature spaces; Y. B. Suris, The Erlangen program and discrete differential geometry; C. Meusburger, Three-dimensional gravity—An application of Felix Klein's ideas in physics; J.-B. Zuber, Invariances in physics and group theory; List of contributors; Index.

IRMA Lectures in Mathematics and Theoretical Physics, Volume 23

April 2015, 348 pages, Hardcover, ISBN: 978-3-03719-148-4, 2010 *Mathematics Subject Classification*: 01-00, 01-02, 01A05, 01A55, 01A70, 22-00, 22-02, 22-03, 51N15, 51P05, 53A20, 53A35, 53B50, 54H15, 58E40, **AMS members US\$40.80**, List US\$51, Order code EMSILMTP/23

Mathematical Physics



Coulomb Gases and Ginzburg-Landau Vortices

Sylvia Serfaty, *Courant Institute of Mathematical Sciences, New York, NY*

The topic of this book is systems of points in Coulomb interaction, in particular, the classical Coulomb gas, and vortices in the

Ginzburg-Landau model of superconductivity. The classical Coulomb and Log gases are classical statistical mechanics models, which have seen important developments in the mathematical literature due to their connection with random matrices and approximation theory. At low temperature these systems are expected to "crystallize" to so-called Fekete sets, which exhibit microscopically a lattice structure. The Ginzburg-Landau model, on the other hand, describes superconductors. In superconducting materials subjected to an external magnetic field, densely packed point vortices emerge, forming perfect triangular lattice patterns, so-called Abrikosov lattices.

This book describes these two systems and explores the similarity between them. It presents the mathematical tools developed to analyze the interaction between the Coulomb particles or the vortices, at the microscopic scale, and describes a "renormalized energy" governing the point patterns. This is believed to measure the disorder of a point configuration and to be minimized by the Abrikosov lattice in dimension 2.

This book gives a self-contained presentation of results on the mean field limit of the Coulomb gas system, with or without temperature, and of the derivation of the renormalized energy. It also provides a streamlined presentation of the similar analysis that can be performed for the Ginzburg-Landau model, including a review of the vortex-specific tools and the derivation of the critical fields, the mean-field limit, and the renormalized energy.

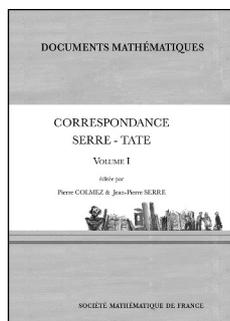
A publication of the European Mathematical Society (EMS). Distributed within the Americas by the American Mathematical Society.

Contents: Introduction; The leading order behavior of the Coulomb gas; Splitting the Hamiltonian; Definition(s) and properties of renormalized energy; Deriving \mathcal{W} as the large n limit: lower bound via a general abstract method; Deriving \mathcal{W} as the large n limit: screening, upper bound, and consequences; The Ginzburg-Landau functional: Presentation and heuristics; Main mathematical tools for Ginzburg-Landau; The leading order behavior for Ginzburg-Landau; The splitting and next order behavior for Ginzburg-Landau; Bibliography; Index.

Zurich Lectures in Advanced Mathematics, Volume 21

March 2015, 165 pages, Softcover, ISBN: 978-3-03719-152-1, 2010 *Mathematics Subject Classification*: 82B05, 82B21, 82B26, 15B52, 82D55, 35A15, 35J20, 35J60, **AMS members US\$30.40**, List US\$38, Order code EMSZLEC/21

Number Theory



Correspondance Serre-Tate: Volume I (1956-1973)

Pierre Colmez, *Institut de Mathématique de Jussieu, Paris V, France*, and **Jean-Pierre Serre**, *Collège de France, Paris, France*, Editors

This volume and its companion volume (see SMFDM/14) reproduce, with notes and comments, the correspondence between Jean-Pierre Serre and John Tate from 1956 to 2000. They also contain a selection of their email correspondence after 2000.

The texts are reproduced in their original language: in English or in French. Most of them are from 1956-1976. They treat questions such as the write-up of Bourbaki's Elements, Galois cohomology, rigid geometry, Tate's conjectures on algebraic cycles, formal and p -divisible groups, complex multiplication, and modular forms: congruence properties, weight 1 forms, and Galois representations.

These volumes should be useful to people interested in number theory or the history of mathematics.

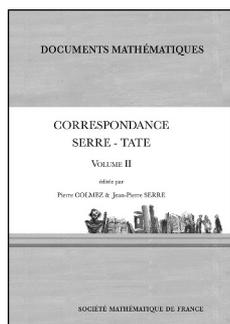
This item will also be of interest to those working in algebra and algebraic geometry.

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: Correspondence Between Jean-Pierre Serre and John Tate, 1956-1973.

Documents Mathématiques, Number 13

May 2015, 448 pages, Softcover, ISBN: 978-2-85629-802-2, 2010 *Mathematics Subject Classification:* 11, 14, **AMS members US\$96**, List US\$120, Order code SMFDM/13



Correspondance Serre-Tate: Volume II (1973-2000)

Pierre Colmez, *Institut de Mathématique de Jussieu, Paris V, France*, and **Jean-Pierre Serre**, *Collège de France, Paris, France*, Editors

This volume and its companion volume (see SMFDM/13) reproduce, with notes and comments, the correspondence between Jean-Pierre Serre and John Tate from 1956 to 2000. They also contain a selection of their email correspondence after 2000.

The texts are reproduced in their original language: in English or in French. Most of them are from 1956-1976. They treat questions

such as the write-up of Bourbaki's Elements, Galois cohomology, rigid geometry, Tate's conjectures on algebraic cycles, formal and p -divisible groups, complex multiplication, and modular forms: congruence properties, weight 1 forms, and Galois representations.

These volumes should be useful to people interested in number theory or the history of mathematics.

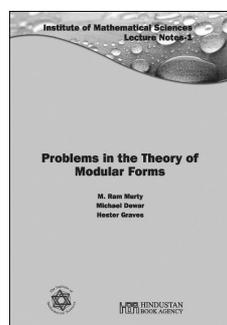
This item will also be of interest to those working in algebra and algebraic geometry.

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: Correspondence Between Jean-Pierre Serre and John Tate, 1973-2000.

Documents Mathématiques, Number 14

May 2015, 521 pages, Softcover, ISBN: 978-2-85629-803-9, 2010 *Mathematics Subject Classification:* 11, 14, **AMS members US\$96**, List US\$120, Order code SMFDM/14



Problems in the Theory of Modular Forms

M. Ram Murty, *Michael Dewar*, and **Hester Graves**, *Queen's University, Kingston, Ontario, Canada*

This book introduces the reader to the fascinating world of modular forms through a problem-solving approach. As such, it can be used by undergraduate and graduate students for self-instruction. The topics covered include q -series, the modular group, the upper half-plane, modular forms of level one and higher level, the Ramanujan τ -function, the Petersson inner product, Hecke operators, Dirichlet series attached to modular forms, and further special topics. It can be viewed as a gentle introduction for a deeper study of the subject. Thus, it is ideal for non-experts seeking an entry into the field.

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

A publication of Hindustan Book Agency; distributed within the Americas by the American Mathematical Society. Maximum discount of 20% for all commercial channels.

Contents: *Part I. Problems:* Jacobi's q -series; The modular group; The upper half-plane; Modular forms of level one; The Ramanujan π -function; Modular forms of higher level; The Petersson inner product; Hecke operators of higher level; Dirichlet series and modular forms; The Petersson inner product; Hecke operators of higher level; Dirichlet series and modular forms; Special topics; *Part II:* Solutions to problems in Part I; Special topics; A short guide for further reading; References; Index.

Hindustan Book Agency

March 2015, 310 pages, Softcover, ISBN: 978-93-80250-72-4, 2010 *Mathematics Subject Classification:* 11F11, 11F03, 11F06; 11F12, 11F20, 11F25, 11F30, 11F33, 11F66, 11F67, **AMS members US\$46.40**, List US\$58, Order code HIN/68