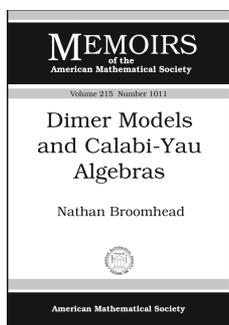


New Publications Offered by the AMS

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Algebra and Algebraic Geometry



Dimer Models and Calabi-Yau Algebras

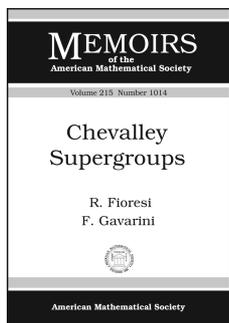
Nathan Broomhead, *Leibniz
University Hannover, Germany*

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

Contents: Introduction; Introduction to the dimer model; Consistency; Zig-zag flows and perfect matchings; Toric algebras and algebraic consistency; Geometric consistency implies algebraic consistency; Calabi-Yau algebras from algebraically consistent dimers; Non-commutative crepant resolutions; Bibliography.

Memoirs of the American Mathematical Society, Volume 215, Number 1011

February 2012, 86 pages, Softcover, ISBN: 978-0-8218-5308-5, 2010 *Mathematics Subject Classification*: 14M25, 14A22; 82B20, **Individual member US\$42**, List US\$70, Institutional member US\$56, Order code MEMO/215/1011



Chevalley Supergroups

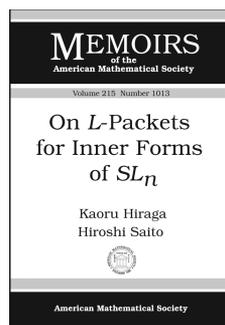
R. Fiorese, *Università di Bologna, Italy*, and F. Gavarini, *Università di Roma "Tor Vergata", Rome, Italy*

Contents: Introduction; Preliminaries; Chevalley bases and Chevalley algebras; Kostant superalgebras; Chevalley

supergroups; The cases $A(1, 1)$, $P(3)$ and $Q(n)$; Appendix A. Sheafification; Bibliography.

Memoirs of the American Mathematical Society, Volume 215, Number 1014

February 2012, 64 pages, Softcover, ISBN: 978-0-8218-5300-9, 2010 *Mathematics Subject Classification*: 14M30, 14A22; 58A50, 17B50, **Individual member US\$36**, List US\$60, Institutional member US\$48, Order code MEMO/215/1014



On L -Packets for Inner Forms of SL_n

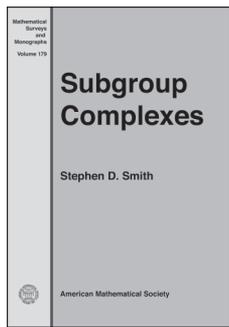
Kaoru Hiraga, *Kyoto University, Japan*, and Hiroshi Saito

Contents: Introduction; Restriction of representations; Whittaker normalization over local fields; Restriction of cusp forms; Whittaker normalization over global fields; Endoscopy and its automorphisms; A conjectural formula for endoscopic

transfer; Descent to Levi subgroups; Relevance conditions for Langlands parameters; Endoscopy for inner forms of GL_n ; Local Langlands correspondence for inner forms of GL_n ; L -packets for inner forms of SL_n ; L -packets for inner forms of SL_n over Archimedean fields; Multiplicity formula for SL_n ; Multiplicity formula for inner forms of SL_n ; Lemmas for trace formula; Trace formula; Transfer factors; Bibliography.

Memoirs of the American Mathematical Society, Volume 215, Number 1013

February 2012, 97 pages, Softcover, ISBN: 978-0-8218-5364-1, 2010 *Mathematics Subject Classification*: 22E50; 11F70, 22E55, **Individual member US\$42**, List US\$70, Institutional member US\$56, Order code MEMO/215/1013



Subgroup Complexes

Stephen D. Smith, *University of Illinois at Chicago, IL*

This book is intended as an overview of a research area that combines geometries for groups (such as Tits buildings and generalizations), topological aspects of simplicial complexes from p -subgroups of a group (in the spirit of Brown, Quillen, and Webb), and combinatorics of partially ordered sets. The material is intended to

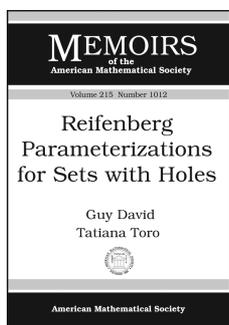
serve as an advanced graduate-level text and partly as a general reference on the research area. The treatment offers optional tracks for the reader interested in buildings, geometries for sporadic simple groups, and G -equivariant equivalences and homology for subgroup complexes.

Contents: Introduction; *Background material and examples:* Background: Posets, simplicial complexes, and topology; Examples: Subgroup complexes as geometries for simple groups; *Fundamental techniques:* Contractibility; Homotopy equivalence; *Basic applications:* The reduced Euler characteristic $\tilde{\chi}$ and variations on vanishing; The reduced Lefschetz module \tilde{L} and projectivity; Group cohomology and decompositions; *Some more advanced topics:* Spheres in homology and Quillen's Conjecture; Connectivity, simple connectivity, and sphericity; Local-coefficient homology and representation theory; Orbit complexes and Alperin's Conjecture; Bibliography; Index.

Mathematical Surveys and Monographs, Volume 179

December 2011, 364 pages, Hardcover, ISBN: 978-0-8218-0501-5, LC 2011036625, 2010 *Mathematics Subject Classification:* 20D05, 20D06, 20D08, 20D30, 20J05, 20C33, 20C34, 05E18, 55Pxx, 55Uxx, **AMS members US\$75.20**, List US\$94, Order code SURV/179

Analysis



Reifenberg Parameterizations for Sets with Holes

Guy David, *Université de Paris Sud, Orsay, France*, and **Tatiana Toro**, *University of Washington, Seattle, WA*

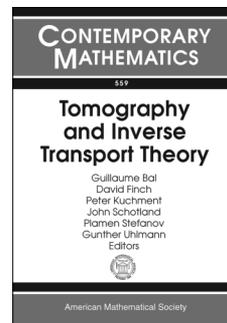
Contents: Introduction; Coherent families of balls and planes; A partition of unity;

Definition of a mapping f on Σ_0 ; Local Lipschitz graph descriptions of the Σ_k ; Reifenberg-flatness of the image; Distortion estimates for $D\sigma_k$; Hölder and Lipschitz properties of f on Σ_0 ; C^2 -regularity of the Σ_k and fields of linear isometries defined on Σ_0 ; The definition of g on the whole \mathbb{R}^n ; Hölder and Lipschitz properties of g on \mathbb{R}^n ; Variants of the Reifenberg theorem; Local lower-Ahlfors regularity and a better sufficient bi-Lipschitz condition; Big pieces of bi-Lipschitz images and approximation by bi-Lipschitz domains; Uniform rectifiability and Ahlfors-regular Reifenberg-flat sets; Bibliography.

Memoirs of the American Mathematical Society, Volume 215, Number 1012

February 2012, 102 pages, Softcover, ISBN: 978-0-8218-5310-8, 2010 *Mathematics Subject Classification:* 28A75, 49Q05; 49Q20, 49K99, **individual member US\$42.60**, List US\$71, Institutional member US\$56.80, Order code MEMO/215/1012

Applications



Tomography and Inverse Transport Theory

Guillaume Bal, *Columbia University, New York, NY*, **David Finch**, *Oregon State University, Corvallis, OR*, **Peter Kuchment**, *Texas A&M University, College Station, TX*, **John Schotland**, *University of Michigan, Ann Arbor, MI*, **Plamen Stefanov**, *Purdue University, West Lafayette, IN*, and **Gunther Uhlmann**, *University of Washington, Seattle, WA*, and *University of California, Irvine, CA*, Editors

This volume contains research and review articles written by participants of two related international workshops "Mathematical Methods in Emerging Modalities of Medical Imaging" (October 2009) and "Inverse Transport Theory and Tomography" (May 2010), which were held at the Banff International Research Station in Banff, Canada. These workshops brought together mathematicians, physicists, engineers, and medical researchers working at the cutting edge of medical imaging research and addressed the demanding mathematical problems arising in this area.

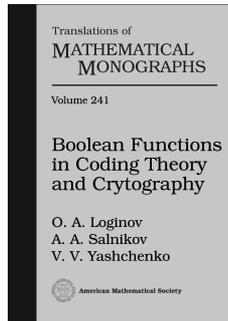
The articles, written by leading experts, address important analytic, numerical, and physical issues of the newly developing imaging modalities (e.g., photoacoustics, current impedance imaging, hybrid imaging techniques, elasticity imaging), as well as the recent progress in resolving outstanding problems of more traditional modalities, such as SPECT, ultrasound imaging, and inverse transport theory. Related topics of invisibility cloaking are also addressed.

Contents: **B. Cox**, **T. Tarvainen**, and **S. Arridge**, Multiple illumination quantitative photoacoustic tomography using transport and diffusion models; **G. Bal** and **A. Jollivet**, Combined source and attenuation reconstructions in SPECT; **G. Bal** and **K. Ren**, Non-uniqueness result for a hybrid inverse problem; **J. Boman**, Local non-injectivity for weighted radom transforms; **A. L. Bukhgeim**, Inverse gravimetry approach to attenuated tomography; **N. Hoell**, Complexification in reconstructive integral geometry; **H. Liu** and **T. Zhou**, Transformation optics and approximate cloaking; **S. McDowell**, **P. Stefanov**, and **A. Tamasan**, Stability of the Gauge equivalent classes in inverse stationary transport in refractive media; **J. McLaughlin**, **A. Thomas**, and **J.-R. Yoon**, Basic theory for generalized linear solid viscoelastic models; **A. Nachman**,

A. Tamasan, and A. Timonov, Current density impedance imaging; F. Natterer, Possibilities and limitations of time domain wave equation imaging; L. V. Nguyen, On singularities and instability of reconstruction in thermoacoustic tomography; D. R. Eaker, S. M. Jorgensen, C. Cui, and E. L. Ritman, Micro-tomography of coherent x-ray scatter using an x-ray collimator and spectral imaging array.

Contemporary Mathematics, Volume 559

January 2012, approximately 195 pages, Softcover, ISBN: 978-0-8218-5301-6, LC 2011033070, 2010 *Mathematics Subject Classification*: 35-XX, 35R30, 45Q05, 65M32, 65N21, 65R32, 74J25, 78A40, 78A45, 78A46, 78A70, 78A99, 92C10, 92C55, **AMS members US\$55.20**, List US\$69, Order code CONM/559



Boolean Functions in Coding Theory and Cryptography

O. A. Loginov, A. A. Salmikov, and V. V. Yashchenko, *Moscow State University, Russia*

This book offers a systematic presentation of cryptographic and code-theoretic aspects of the theory of Boolean functions.

Both classical and recent results are thoroughly presented. Prerequisites for the book include basic knowledge of linear algebra, group theory, theory of finite fields, combinatorics, and probability. The book can be used by research mathematicians and graduate students interested in discrete mathematics, coding theory, and cryptography.

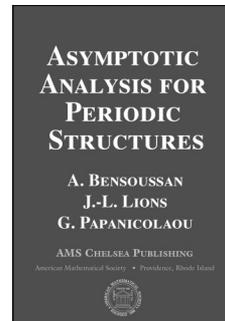
This item will also be of interest to those working in logic and foundations.

Contents: Arithmetics of finite fields and polynomials; Boolean functions; Classifications of Boolean functions; Linear codes over the field \mathbb{F} ; Reed-Muller codes; Nonlinearity; Correlation immunity and resiliency; Codes, Boolean mappings and their cryptographic properties; Basics of cryptanalysis; Bibliography; Index.

Translations of Mathematical Monographs, Volume 241

February 2012, approximately 335 pages, Hardcover, ISBN: 978-0-8218-4680-3, LC 2011035308, 2010 *Mathematics Subject Classification*: 94-02; 94A60, 94C10, **AMS members US\$103.20**, List US\$129, Order code MMONO/241

Differential Equations



Asymptotic Analysis for Periodic Structures

A. Bensoussan, *University of Texas at Dallas, Richardson, TX*, and Hong Kong Polytechnic University, Kowloon, Hong Kong, J.-L. Lions, and G. Papanicolaou, *Stanford University, CA*

This is a reprinting of a book originally published in 1978. At that time it was the first book on the subject of homogenization, which is the asymptotic analysis of partial differential equations with rapidly oscillating coefficients, and as such it sets the stage for what problems to consider and what methods to use, including probabilistic methods. At the time the book was written the use of asymptotic expansions with multiple scales was new, especially their use as a theoretical tool, combined with energy methods and the construction of test functions for analysis with weak convergence methods. Before this book, multiple scale methods were primarily used for non-linear oscillation problems in the applied mathematics community, not for analyzing spatial oscillations as in homogenization.

In the current printing a number of minor corrections have been made, and the bibliography was significantly expanded to include some of the most important recent references. This book gives systematic introduction of multiple scale methods for partial differential equations, including their original use for rigorous mathematical analysis in elliptic, parabolic, and hyperbolic problems, and with the use of probabilistic methods when appropriate. The book continues to be interesting and useful to readers of different backgrounds, both from pure and applied mathematics, because of its informal style of introducing the multiple scale methodology and the detailed proofs.

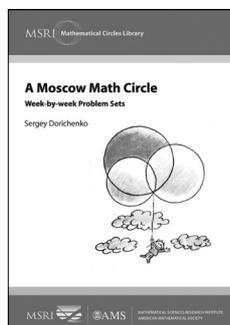
This item will also be of interest to those working in applications.

Contents: Introduction; Elliptic operators; Evolution operators; Probabilistic problems and methods; High frequency wave propagation in periodic structures; Bibliography.

AMS Chelsea Publishing, Volume 374

December 2011, 392 pages, Hardcover, ISBN: 978-0-8218-5324-5, LC 2011029403, 2010 *Mathematics Subject Classification*: 80M40, 35B27, 74Q05, 74Q10, 60H10, 60F05, **AMS members US\$54.90**, List US\$61, Order code CHEL/374.H

General Interest



A Moscow Math Circle Week-by-week Problem Sets

Sergey Dorichenko, *Moscow Schools 57 and 179, Russia, and Kvant Magazine, Moscow, Russia*

Moscow has a rich tradition of successful math circles, to the extent that many other circles are modeled on them. This book presents materials used during the course

of one year in a math circle organized by mathematics faculty at Moscow State University, and also used at the mathematics magnet school known as Moscow School Number 57.

Each problem set has a similar structure: it combines review material with a new topic, offering problems in a range of difficulty levels. This time-tested pattern has proved its effectiveness in engaging all students and helping them master new material while building on earlier knowledge.

The introduction describes in detail how the math circles at Moscow State University are run. Dorichenko describes how the early sessions differ from later sessions, how to choose problems, and what sorts of difficulties may arise when running a circle. The book also includes a selection of problems used in the competition known as the Mathematical Maze, a mathematical story based on actual lessons with students, and an addendum on the San Jose Mathematical Circle, which is run in the Russian style.

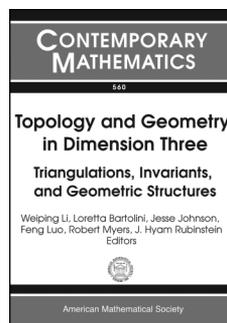
Titles in this series are co-published with the Mathematical Sciences Research Institute (MSRI).

Contents: Problem sets 0–13; Winter competition; Problem sets 14–28; Solutions to problem sets 0–13; Solutions to the winter competition; Solutions to problem sets 14–28; Mathematical maze; Two and two is more than four; A story; Addendum: The San Jose experience; Problem set SJ1; Solutions to problem set SJ1; Problem set SJ2; Solutions to problem set SJ2; Problem set SJ3; Solutions to problem set SJ3.

MSRI Mathematical Circles Library, Volume 8

January 2012, approximately 334 pages, Softcover, ISBN: 978-0-8218-6874-4, LC 2011036422, 2010 *Mathematics Subject Classification*: 00A08; 00A07, **AMS members US\$39.20**, List US\$49, Order code MCL/8

Geometry and Topology



Topology and Geometry in Dimension Three

Triangulations, Invariants,
and Geometric Structures

Weiping Li, *Loretta Bartolini*,
and **Jesse Johnson**, *Oklahoma
State University, Stillwater, OK*,
Feng Luo, *Rutgers University,
New Brunswick, NJ*, **Robert
Myers**, *Oklahoma State
University, Stillwater, OK*, and
J. Hyam Rubinstein, *University
of Melbourne, Parkville, Victoria,
Australia*, Editors

This volume contains the proceedings of a conference held from June 4–6, 2010, at Oklahoma State University, in honor of William (Bus) Jaco's 70th birthday. His contributions to research in low dimensional geometry and topology and to the American mathematical community, especially through his work for the American Mathematical Society, were recognized during the conference.

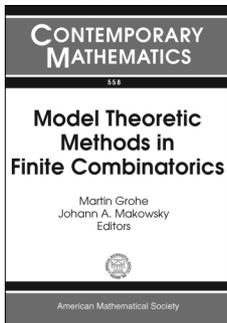
The focus of the conference was on triangulations and geometric structures for three-dimensional manifolds. The papers in this volume present significant new results on these topics, as well as in geometric group theory.

Contents: **I. Agol**, Ideal triangulations of pseudo-Anosov mapping tori; **F. Luo**, A note on complete hyperbolic structures on ideal triangulated 3-manifolds; **T. Kobayashi** and **Y. Rieck**, A linear bound on the tetrahedral number of manifolds of bounded volume (after Jørgensen and Thurston); **J. Johnson**, Layered models for closed 3-manifolds; **Z. Liu**, Triangulations and nonorientable incompressible surfaces; **B. Fozzwell** and **H. Rubinstein**, Introduction to the theory of Haken n -manifolds; **H. Segerman** and **S. Tillmann**, Pseudo-developing maps for ideal triangulations I: Essential edges and generalised hyperbolic gluing equations; **P. B. Shalen**, A generic Margulis number for hyperbolic 3-manifolds; **J. E. Grigsby** and **S. M. Wehrli**, On gradings in Khovanov homology and sutured Floer homology; **R. Myers**, Hyperbolic knots in irreducible Heegaard surfaces; **D. Calegari** and **D. Zhuang**, Stable W -length; **N. Brady**, **M. Clay**, and **M. Forester**, Turn graphs and extremal surfaces in free groups; **F. Bonahon** and **H. Wong**, Kauffman brackets, character varieties and triangulations of surfaces; **J. H. Rubinstein**, Problems at the Jacofest.

Contemporary Mathematics, Volume 560

January 2012, approximately 198 pages, Softcover, ISBN: 978-0-8218-5295-8, 2010 *Mathematics Subject Classification*: 57Mxx, 57N10, 46E25, 20C20, 20F65, 20J99, 14E20, **AMS members US\$55.20**, List US\$69, Order code CONM/560

Logic and Foundations



Model Theoretic Methods in Finite Combinatorics

Martin Grohe, *Humboldt-Universität zu Berlin, Germany*, and **Johann A. Makowsky**, *Technion-Israel Institute of Technology, Haifa, Israel*, Editors

This volume contains the proceedings of the AMS-ASL Special Session on Model Theoretic Methods in Finite Combinatorics, held January 5–8, 2009, in Washington, DC.

Over the last 20 years, various new connections between model theory and finite combinatorics emerged. The best known of these are in the area of 0-1 laws, but in recent years other very promising interactions between model theory and combinatorics have been developed in areas such as extremal combinatorics and graph limits, graph polynomials, homomorphism functions and related counting functions, and discrete algorithms, touching the boundaries of computer science and statistical physics.

This volume highlights some of the main results, techniques, and research directions of the area. Topics covered in this volume include recent developments on 0-1 laws and their variations, counting functions defined by homomorphisms and graph polynomials and their relation to logic, recurrences and spectra, the logical complexity of graphs, algorithmic meta theorems based on logic, universal and homogeneous structures, and logical aspects of Ramsey theory.

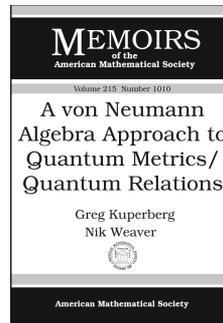
This item will also be of interest to those working in discrete mathematics and combinatorics.

Contents: E. Fischer, T. Kotek, and J. A. Makowsky, Application of logic to combinatorial sequences and their recurrence relations; J. P. Bell, S. N. Burris, and K. Yeats, Spectra and systems of equations; J. P. Bell and S. N. Burris, Compton's method for proving logical limit laws; O. Pikhurko and O. Verbitsky, Logical complexity of graphs: A survey; M. Grohe and S. Kreutzer, Methods for algorithmic meta theorems; T. Kotek, J. A. Makowsky, and B. Zilber, On counting generalized colorings; M. Grohe and M. Thurley, Counting homomorphisms and partition functions; J. Hubička and J. Nešetřil, Some examples of universal and generic partial orders; G. Cherlin, Two problems on homogeneous structures, revisited; A. Hasson, M. Kojman, and A. Onshuus, On symmetric indivisibility of countable structures; A. Blass, Partitions and permutation groups; D. Kuske, (Un)countable and (non)effective versions of Ramsey's theorem; M. Bodirsky and M. Pinsker, Reducts of Ramsey structures.

Contemporary Mathematics, Volume 558

December 2011, 519 pages, Softcover, ISBN: 978-0-8218-4943-9, LC 2011031229, 2010 *Mathematics Subject Classification*: 03-02, 03-06, 05-02, 05-06, 68-02, 68-06, **AMS members US\$116**, List US\$145, Order code CONM/558

Mathematical Physics



A von Neumann Algebra Approach to Quantum Metrics/Quantum Relations

Greg Kuperberg, *University of California, Davis, CA*, and **Nik Weaver**, *Washington University, St. Louis, MO*

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

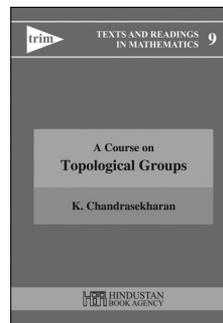
Contents: *A von Neumann Algebra Approach to Quantum Metrics* by Greg Kuperberg and Nik Weaver: Introduction; Measurable and quantum relations; Quantum metrics; Examples; Lipschitz operators; Quantum uniformities; Bibliography; *Quantum Relations* by Nik Weaver: Introduction; Measurable relations; Quantum relations; Bibliography; Notation index; Subject index.

Memoirs of the American Mathematical Society, Volume 215, Number 1010

February 2012, 140 pages, Softcover, ISBN: 978-0-8218-5341-2, 2010 *Mathematics Subject Classification*: 46L89, 28A99; 81P70, 46L10, 54E35, **Individual member US\$46.80**, List US\$78, Institutional member US\$62.40, Order code MEMO/215/1010

New AMS-Distributed Publications

Algebra and Algebraic Geometry



A Course on Topological Groups

K. Chandrasekharan, *Eidgen Technische Hochschule, Zürich, Switzerland*

The presentation in this text is clear and to the point. The methods used are good classical ones. This is a good text for a student who knows little about locally compact groups and wants to get an

introduction to some of the fundamental ideas needed to begin the study of them.

– Mathematical Reviews

This book contains the author's notes for a course that he taught at ETH, Zürich. The aim is to lead the reader to a proof of the Peter-Weyl theorem, the basic theorem in the representation theory of compact topological groups. The topological, analytical, and algebraic groundwork needed for the proof is provided as part of the course.

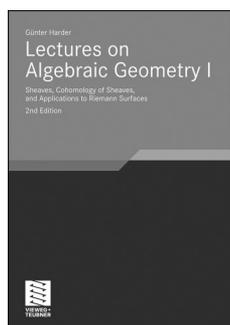
This item will also be of interest to those working in geometry and topology.

A publication of Hindustan Book Agency; distributed within the Americas by the American Mathematical Society.

Contents: Topological preliminaries; The Haar measure on a locally compact group; Hilbert spaces and the spectral theorem; Compact groups and their representations.

Hindustan Book Agency

September 2011, 126 pages, Softcover, ISBN: 978-93-80250-20-5, 2010 *Mathematics Subject Classification:* 22Dxx, 43A05, 43A65, **AMS members US\$25.60**, List US\$32, Order code HIN/53



Lectures on Algebraic Geometry I
Second Edition

Günter Harder, Max Planck Institute for Mathematics, Bonn, Germany

This book and the second volume provide an introduction to modern algebraic geometry. In this volume, the methods of

homological algebra, theory of sheaves, and sheaf cohomology are developed. These methods are indispensable for modern algebraic geometry, but they are also fundamental for other branches of mathematics and of great interest in their own right.

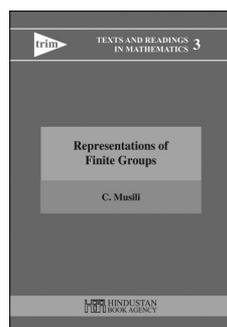
In the last chapter, these concepts are applied to the theory of compact Riemann surfaces. In this chapter the author emphasizes how influential the ideas of Abel, Riemann, and Jacobi were and discusses their impact on many modern methods.

A publication of Vieweg+Teubner. The AMS is exclusive distributor in North America. Vieweg+Teubner Publications are available worldwide from the AMS outside of Germany, Switzerland, Austria, and Japan.

Contents: Categories, products, projective and inductive limits; Basic concepts of homological algebra; Sheaves; Cohomology of sheaves; Compact Riemann surfaces and Abelian varieties.

Vieweg Aspects of Mathematics, Volume 35

September 2011, 299 pages, Hardcover, ISBN: 978-3-8348-1844-7, **AMS members US\$72**, List US\$80, Order code VWAM/35.R



Representations of Finite Groups

C. Musili, University of Hyderabad, India

The book under review presents an interesting approach to certain aspects of the representation theory of finite groups over the complex field.

– Mathematical Reviews

This book serves several purposes. The first and foremost is to give an elementary introduction to the basic concepts of the theory of ordinary representations to finite groups with a minimum of prerequisites.

The second purpose, which is also the main theme of this exposition, is to be able to do the theory rather explicitly for the important special case of the symmetric groups S_n of permutations on n letters.

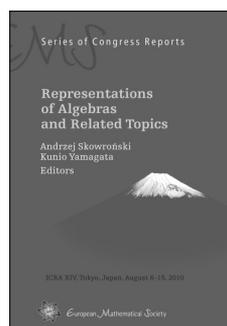
The third purpose is to use the preparatory material of the first two parts, coupled with the S_n theory, to do the same for some other important special groups, namely, the alternating group A_n and the hyperoctahedral groups B_n and D_n .

A publication of Hindustan Book Agency; distributed within the Americas by the American Mathematical Society.

Contents: *Part I. The Structure of Semi-simple Rings:* Preliminaries; Semi-simple rings and Brauer group; *Part II. Representations of Finite Groups:* Representations of finite groups; Induced representations; *Part III. Representations of symmetric and alternating groups:* Representations of the symmetric group S_n ; Representations of the alternating group A_n ; *Part IV. Representations of the Hyperoctahedral Groups B_n and D_n :* Representations of the hyperoctahedral group B_n ; Representations of the hyperoctahedral group D_n .

Hindustan Book Agency

September 2011, 250 pages, Softcover, ISBN: 978-93-80250-18-2, 2010 *Mathematics Subject Classification:* 20C15, 20-01, 20C30, **AMS members US\$32**, List US\$40, Order code HIN/51



Representations of Algebras and Related Topics

Andrzej Skowroński, Nicolaus Copernicus University, Torun, Poland, and Kunio Yamagata, Tokyo University of Agriculture and Technology, Fuchu, Japan, Editors

This book, which explores recent trends in the representation theory of algebras and its exciting interaction with geometry, topology, commutative algebra, Lie algebras, combinatorics, quantum algebras, and theoretical field, is conceived as a handbook

to provide easy access to the present state of knowledge and stimulate further development.

The many topics discussed include quivers, quivers with potential, bound quiver algebras, Jacobian algebras, cluster algebras and categories, Calabi-Yau algebras and categories, triangulated and derived categories, and quantum loop algebras.

This book consists of thirteen self-contained expository survey and research articles and is addressed to researchers and graduate students in algebra as well as a broader mathematical community. The articles contain a large number of examples and open problems and give new perspectives for research in the field.

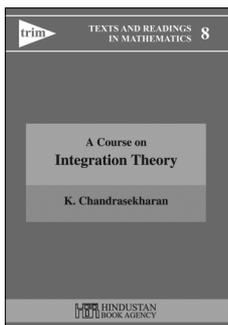
A publication of the European Mathematical Society (EMS). Distributed within the Americas by the American Mathematical Society.

Contents: C. Amiot, On generalized cluster categories; D. J. Benson, S. B. Iyengar, and H. Krause, Module categories for finite group algebras; B. Keller, On cluster theory and quantum dilogarithm identities; B. Leclerc, Quantum loop algebras, quiver varieties, and cluster algebras; H. Lenzing, Weighted projective lines and applications; M. Linckelmann, Cohomology of block algebras of finite groups; P. Malicki and A. Skowroński, Algebras with separating Auslander-Reiten components; I. Mori, Classification problems in noncommutative algebraic geometry and representation theory; T. Nakanishi, Periodicities in cluster algebras and dilogarithm identities; J. A. de la Peña and A. Skowroński, The Tits forms of tame algebras and their roots; C. M. Ringel, The minimal representation-infinite algebras which are special biserial; D. Simson, Coalgebras of tame comodule type, comodule categories, and a tame-wild dichotomy problem; G. Zwara, Singularities of orbit closures in module varieties.

EMS Series of Congress Reports, Volume 5

September 2011, 740 pages, Hardcover, ISBN: 978-3-03719-101-9, 2010 *Mathematics Subject Classification*: 13Dxx, 13Fxx, 14Bxx, 14Hxx, 14Lxx, 14Mxx, 14Nxx, 15Axx, 16Dxx, 16Exx, 16Gxx, 16Sxx, 16Wxx, 17Bxx, 18Exx, 19Kxx, 20Cxx, 20Jxx, **AMS members US\$110.40**, List US\$138, Order code EMSSCR/5

Analysis



A Course on Integration Theory

K. Chandrasekharan, *Eidgen Technische Hochschule, Zürich, Switzerland*

As the author asserts, the material presented in this slim volume is classical; his goal has been "concision, clarity, and accuracy". The author is extraordinarily careful in detail, for example in showing that the integrals of simple functions and integrable functions are well-defined.

– Mathematical Reviews

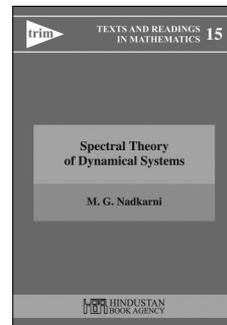
This book on integration theory is based on the lecture notes for courses that the author gave at the Tata Institute of Fundamental Research, Mumbai, and at ETH, Zürich. The subject matter is classical. The goal of the notes is to provide a concise, clear, and accurate treatment of the basic ideas of the subject.

A publication of Hindustan Book Agency; distributed within the Americas by the American Mathematical Society.

Contents: Integration on a measure space; The Lebesgue spaces; The outer measure and its applications: The Lebesgue measure; Product measures and multiple integrals; Set functions and their derivatives.

Hindustan Book Agency

September 2011, 126 pages, Softcover, ISBN: 978-93-80250-19-9, 2010 *Mathematics Subject Classification*: 28-01, **AMS members US\$25.60**, List US\$32, Order code HIN/52



Spectral Theory of Dynamical Systems

M. G. Nadkarni, *University of Mumbai, India*

... compile and communicate in a unique way a lot of mathematics that is of current interest but is not otherwise so readily at hand.

– Ergodic Theory and Dynamical Systems

This book treats some basic topics in the spectral theory of dynamical systems. The treatment is at a general level, but two more advanced theorems, one by H. Helson and W. Parry and the other by B. Host, are presented. Moreover, Ornstein's family of mixing rank one automorphisms is described with construction and proof. Systems of imprimitivity and their relevance to ergodic theory are discussed, and Baire category theorems of ergodic theory, scattered in the literature, are derived in a unified way. Riesz products are considered and they are used to describe the spectral types and eigenvalues of rank one automorphisms.

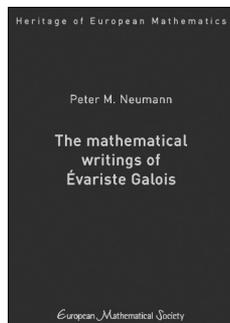
A publication of Hindustan Book Agency; distributed within the Americas by the American Mathematical Society.

Contents: The Hahn-Hellinger theorem; The spectral theorem for unitary operators; Symmetry and denseness of the spectrum; Multiplicity and rank; The Skew product; A theorem of Helson and Parry; Probability measures on the circle group; Baire category theorems of ergodic theory; Translations of measures on the circle; B. Host's theorem; L-eigenvalues of non-singular automorphisms; Generalities on systems of imprimitivity; Dual systems of imprimitivity; Saturated subgroups of the circle group; Riesz products as spectral measures; Additional topics.

Hindustan Book Agency

September 2011, 226 pages, Softcover, ISBN: 978-93-80250-21-2, 2010 *Mathematics Subject Classification*: 28Dxx, 60Bxx, **AMS members US\$32**, List US\$40, Order code HIN/54

General Interest



The Mathematical Writings of Évariste Galois

Peter M. Neumann, *Queen's College, Oxford, England*

Before he died at the age of twenty, shot in a mysterious early-morning duel at the end of May 1832, Évariste Galois created mathematics that changed the direction of algebra.

This book contains English translations of almost all the Galois material. The translations are presented alongside a new transcription of the original French and are enhanced by three levels of commentary. An introduction explains the context of Galois' work, the various publications in which it appears, and the vagaries of his manuscripts. Then there is a chapter in which the five mathematical articles published in his lifetime are reprinted. After that come the testamentary letter and the first memoir (in which Galois expounded on the ideas that led to Galois Theory), which are the most famous of the manuscripts. These are followed by the second memoir and other lesser known manuscripts.

This book makes available to a wide mathematical and historical readership some of the most exciting mathematics of the first half of the nineteenth century, presented in its original form. The primary aim is to establish a text of what Galois wrote. The details of what he did, the proper evidence of his genius, deserve to be well understood and appreciated by mathematicians as well as historians of mathematics.

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

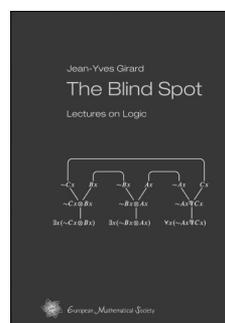
A publication of the European Mathematical Society (EMS). Distributed within the Americas by the American Mathematical Society.

Contents: Introduction; The published articles; The testamentary letter of 29 May 1832; The first memoir; The second memoir; The minor mathematical manuscripts; Epilogue: Myths and mysteries; Bibliography; Index.

Heritage of European Mathematics, Volume 6

October 2011, 421 pages, Hardcover, ISBN: 978-3-03719-104-0, 2010 *Mathematics Subject Classification:* 01-02, 11A55, 01A75, 00B55, 11-03, 12-03, 12E12, 12E20, 12F10, 20-02, 20-03, 20B05, 20B15, 20D05, 33-03, 33E05, **AMS members US\$78.40**, List US\$98, Order code EMSHEM/6

Logic and Foundations



The Blind Spot Lectures on Logic

Jean-Yves Girard, *Institut de Mathématiques de Luminy, Marseille, France*

These lectures on logic, more specifically proof theory, are basically intended for postgraduate students and researchers in logic.

The question at stake is the nature of mathematical knowledge and the difference between a question and an answer, i.e., the implicit and the explicit.

The problem is delicate mathematically and philosophically as well: the relation between a question and its answer is a sort of equality where one side is "more equal than the other": one thus discovers essentialist blind spots.

Starting with Gödel's paradox (1931)—so to speak, the incompleteness of answers with respect to questions—the book proceeds with paradigms inherited from Gentzen's cut-elimination (1935). Various settings are studied: sequent calculus, natural deduction, lambda calculi, category-theoretic composition, up to geometry of interaction (GoI), all devoted to explicitation, which eventually amounts to inverting an operator in a von Neumann algebra.

Mathematical language is usually described as referring to a preexisting reality. Logical operations can be given an alternative procedural meaning: typically, the operators involved in GoI are invertible, not because they are constructed according to the book, but because logical rules are those ensuring invertibility. Similarly, the durability of truth should not be taken for granted: one should distinguish between imperfect (perennial) and perfect modes. The procedural explanation of the infinite thus identifies it with the unfinished, i.e., the perennial. But is perennality perennial? This questioning yields a possible logical explanation for algorithmic complexity.

This highly original course on logic by one of the world's leading proof theorists challenges mathematicians, computer scientists, physicists, and philosophers to rethink their views and concepts on the nature of mathematical knowledge in an exceptionally profound way.

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

Contents: *Part I. The basics:* Existence vs. essence; Incompleteness; Classical sequents: LK; Intuitionistic logic: LJ, NJ; *Part II Around Curry-Howard:* Functional interpretations; System F; The category-theoretic interpretation; *Part III. Linear logic:* Coherent spaces; Linear logic; Perfection vs. imperfection; Proof-nets; *Part IV. Polarised interpretations:* A hypothesis: polarisation; Designs and behaviours; Ludics: The reconstruction; Orthodox exponentials; *Part V. Iconoclasm:* Heterodox exponentials; Quantum coherent spaces; Nets and duality; *Part VI. Geometry of interaction:* The feedback equation; Babel Tower vs. Great Wall; Finite GoI; Envoi. The phantom of transparency; Bibliography; Index.

September 2011, 550 pages, Hardcover, ISBN: 978-3-03719-088-3, 2010 *Mathematics Subject Classification:* 03-01, 03A05, 03B40, 03Fxx, 18A15, 68Qxx, **AMS members US\$78.40**, List US\$98, Order code EMSTBS