

Pioneers Of Representation Theory Frobenius Burnside Schur And Brauer History Of Mathematics

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Representations of the Infinite Symmetric Group

- Alexei Borodin 2017

An introduction to the

modern representation theory of big groups, exploring its connections to

probability and algebraic combinatorics.

Ausdehnungslehre -

Hermann Günther

Grassmann

The Ausdehnungslehre of 1862 is Grassmann's most mature presentation of his "extension theory".

The work was unique in capturing the full sweep of his mathematical achievements. Compared with Grassmann's first book, Lineale

Ausdehnungslehre, this book contains an enormous amount of new material, including a detailed development of the inner product and its relation to the concept of angle, the "theory of functions" from the point of view of extension theory, and Grassmann's contribution to the Pfaff problem. In many ways, this book is the version of Grassmann's system most accessible to contemporary readers.

This translation is

based on the material in Grassmann's "Gesammelte Werke", published by B. G. Teubner (Stuttgart and Leipzig, Germany).

It includes nearly all the Editorial Notes from that edition, but the "improved" proofs are relocated, and Grassmann's original proofs are restored to their proper places. The original Editorial Notes are augmented by Supplementary Notes, elucidating Grassmann's achievement in modern terms. This is the third in an informal sequence of works to be included within the History of Mathematics series, co-published by the AMS and the London Mathematical Society. Volumes in this subset are classical mathematical works that served as cornerstones for modern mathematical thought.

Introduction to Representation Theory -

Pavel I. Etingof 2011

Very roughly speaking, representation theory studies symmetry in linear spaces. It is a beautiful mathematical subject which has many applications, ranging from number theory and combinatorics to geometry, probability theory, quantum mechanics, and quantum field theory. The goal of this book is to give a ``holistic'' introduction to representation theory, presenting it as a unified subject which studies representations of associative algebras and treating the representation theories of groups, Lie algebras, and quivers as special cases. Using this approach, the book covers a number of standard topics in the representation theories of these structures. Theoretical material in the book is supplemented by many problems and

exercises which touch upon a lot of additional topics; the more difficult exercises are provided with hints. The book is designed as a textbook for advanced undergraduate and beginning graduate students. It should be accessible to students with a strong background in linear algebra and a basic knowledge of abstract algebra.

The Princeton Companion to Mathematics - Timothy Gowers 2010-07-18

This is a one-of-a-kind reference for anyone with a serious interest in mathematics. Edited by Timothy Gowers, a recipient of the Fields Medal, it presents nearly two hundred entries, written especially for this book by some of the world's leading mathematicians, that introduce basic mathematical tools and vocabulary; trace the development of modern

mathematics; explain essential terms and concepts; examine core ideas in major areas of mathematics; describe the achievements of scores of famous mathematicians; explore the impact of mathematics on other disciplines such as biology, finance, and music--and much, much more. Unparalleled in its depth of coverage, The Princeton Companion to Mathematics surveys the most active and exciting branches of pure mathematics. Accessible in style, this is an indispensable resource for undergraduate and graduate students in mathematics as well as for researchers and scholars seeking to understand areas outside their specialties. Features nearly 200 entries, organized thematically and written by an international team

of distinguished contributors Presents major ideas and branches of pure mathematics in a clear, accessible style Defines and explains important mathematical concepts, methods, theorems, and open problems Introduces the language of mathematics and the goals of mathematical research Covers number theory, algebra, analysis, geometry, logic, probability, and more Traces the history and development of modern mathematics Profiles more than ninety-five mathematicians who influenced those working today Explores the influence of mathematics on other disciplines Includes bibliographies, cross-references, and a comprehensive index Contributors include: Graham Allan, Noga Alon, George Andrews, Tom Archibald, Sir Michael Atiyah, David Aubin,

Joan Bagaria, Keith
Ball, June Barrow-Green,
Alan Beardon, David D.
Ben-Zvi, Vitaly
Bergelson, Nicholas
Bingham, Béla Bollobás,
Henk Bos, Bodil Branner,
Martin R. Bridson, John
P. Burgess, Kevin
Buzzard, Peter J.
Cameron, Jean-Luc
Chabert, Eugenia Cheng,
Clifford C. Cocks, Alain
Connes, Leo Corry,
Wolfgang Coy, Tony
Crilly, Serafina Cuomo,
Mihalis Dafermos, Partha
Dasgupta, Ingrid
Daubechies, Joseph W.
Dauben, John W. Dawson
Jr., Francois de Gandt,
Persi Diaconis, Jordan
S. Ellenberg, Lawrence
C. Evans, Florence
Fasanelli, Anita Burdman
Feferman, Solomon
Feferman, Charles
Fefferman, Della
Fenster, José Ferreirós,
David Fisher, Terry
Gannon, A. Gardiner,
Charles C. Gillispie,
Oded Goldreich,
Catherine Goldstein,

Fernando Q. Gouvêa,
Timothy Gowers, Andrew
Granville, Ivor Grattan-
Guinness, Jeremy Gray,
Ben Green, Ian
Grojnowski, Niccolò
Guicciardini, Michael
Harris, Ulf Hashagen,
Nigel Higson, Andrew
Hodges, F. E. A.
Johnson, Mark Joshi,
Kiran S. Kedlaya, Frank
Kelly, Sergiu
Klainerman, Jon
Kleinberg, Israel
Kleiner, Jacek
Klinowski, Eberhard
Knobloch, János Kollár,
T. W. Körner, Michael
Krivelevich, Peter D.
Lax, Imre Leader, Jean-
François Le Gall, W. B.
R. Lickorish, Martin W.
Liebeck, Jesper Lützen,
Des MacHale, Alan L.
Mackay, Shahn Majid,
Lech Maligranda, David
Marker, Jean Mawhin,
Barry Mazur, Dusa
McDuff, Colin McLarty,
Bojan Mohar, Peter M.
Neumann, Catherine
Nolan, James Norris,
Brian Osserman, Richard

S. Palais, Marco Panza,
Karen Hunger Parshall,
Gabriel P. Paternain,
Jeanne Peiffer, Carl
Pomerance, Helmut Pulte,
Bruce Reed, Michael C.
Reed, Adrian Rice,
Eleanor Robson, Igor
Rodnianski, John Roe,
Mark Ronan, Edward
Sandifer, Tilman Sauer,
Norbert Schappacher,
Andrzej Schinzel, Erhard
Scholz, Reinhard
Siegmond-Schultze,
Gordon Slade, David J.
Spiegelhalter,
Jacqueline Stedall,
Arild Stubhaug, Madhu
Sudan, Terence Tao,
Jamie Tappenden, C. H.
Taubes, Rüdiger Thiele,
Burt Totaro, Lloyd N.
Trefethen, Dirk van
Dalen, Richard Weber,
Dominic Welsh, Avi
Wigderson, Herbert Wilf,
David Wilkins, B.
Yandell, Eric Zaslow,
Doron Zeilberger
Groups and Symmetries -
Yvette Kosmann-
Schwarzbach 2022-07-16
- Combines material from

many areas of
mathematics, including
algebra, geometry, and
analysis, so students
see connections between
these areas - Applies
material to physics so
students appreciate the
applications of abstract
mathematics - Assumes
only linear algebra and
calculus, making an
advanced subject
accessible to
undergraduates -
Includes 142 exercises,
many with hints or
complete solutions, so
text may be used in the
classroom or for self
study

**Certain Number-Theoretic
Episodes In Algebra,
Second Edition** - R

Sivaramakrishnan
2019-03-19

The book attempts to
point out the
interconnections between
number theory and
algebra with a view to
making a student
understand certain basic
concepts in the two

areas forming the subject-matter of the book.

Non-Euclidean Geometry in the Theory of Automorphic Functions - Jacques Hadamard 1999-01-01

This is the English translation of a volume originally published only in Russian and now out of print. The book was written by Jacques Hadamard on the work of Poincare. Poincare's creation of a theory of automorphic functions in the early 1880s was one of the most significant mathematical achievements of the nineteenth century. It directly inspired the uniformization theorem, led to a class of functions adequate to solve all linear ordinary differential equations, and focused attention on a large new class of discrete groups. It was the first significant application

of non-Euclidean geometry. This unique exposition by Hadamard offers a fascinating and intuitive introduction to the subject of automorphic functions and illuminates its connection to differential equations, a connection not often found in other texts.

Mathematics and Social Utopias in France - Simon Altmann 2006-10-17
Social reformer, banker, and mathematician, Olinde Rodrigues is a fascinating figure of nineteenth-century Paris. Information about him is obscure--scattered in publications on history, mathematics, and the social sciences--and often inaccurate. Rodrigues left no papers or archives. Here, for the first time, is an authoritative account of his family history, education, and important mathematical works.

Written by a team of prominent mathematicians and historians, the book comprises the interests and associations that make Rodrigues such a remarkable character in the history of mathematics. This is a superb panorama of nineteenth-century France, portrayed through the life and work of Olinde Rodrigues. The beginning chapters attempt to recreate the scientific and social background of nineteenth-century Paris and Rodrigues's place in it. The following chapters discuss his contributions to a variety of mathematical fields (e.g., orthogonal polynomials, combinatorics, and rotations). The final chapters discuss contemporary reactions to his mathematical work. Sufficient background is given to

readers familiar with basic college mathematics. The book is suitable for specialists in the history of mathematics and/or science, graduate students, and mathematicians. Co-published with the London Mathematical Society beginning with Volume 4.

Lie Groups - Daniel Bump
2013-10-01

This book is intended for a one-year graduate course on Lie groups and Lie algebras. The book goes beyond the representation theory of compact Lie groups, which is the basis of many texts, and provides a carefully chosen range of material to give the student the bigger picture. The book is organized to allow different paths through the material depending on one's interests. This second edition has substantial new

material, including improved discussions of underlying principles, streamlining of some proofs, and many results and topics that were not in the first edition. For compact Lie groups, the book covers the Peter–Weyl theorem, Lie algebra, conjugacy of maximal tori, the Weyl group, roots and weights, Weyl character formula, the fundamental group and more. The book continues with the study of complex analytic groups and general noncompact Lie groups, covering the Bruhat decomposition, Coxeter groups, flag varieties, symmetric spaces, Satake diagrams, embeddings of Lie groups and spin. Other topics that are treated are symmetric function theory, the representation theory of the symmetric group, Frobenius–Schur duality and $GL(n) \times GL(m)$ duality with many

applications including some in random matrix theory, branching rules, Toeplitz determinants, combinatorics of tableaux, Gelfand pairs, Hecke algebras, the "philosophy of cusp forms" and the cohomology of Grassmannians. An appendix introduces the reader to the use of Sage mathematical software for Lie group computations.

A Tour of Representation Theory - Martin Lorenz 2018

Representation theory investigates the different ways in which a given algebraic object--such as a group or a Lie algebra--can act on a vector space. Besides being a subject of great intrinsic beauty, the theory enjoys the additional benefit of having applications in myriad contexts outside pure mathematics, including

quantum field theory and the study of molecules in chemistry. Adopting a panoramic viewpoint, this book offers an introduction to four different flavors of representation theory: representations of algebras, groups, Lie algebras, and Hopf algebras. A separate part of the book is devoted to each of these areas and they are all treated in sufficient depth to enable and hopefully entice the reader to pursue research in representation theory. The book is intended as a textbook for a course on representation theory, which could immediately follow the standard graduate abstract algebra course, and for subsequent more advanced reading courses. Therefore, more than 350 exercises at various levels of difficulty are included.

The broad range of topics covered will also make the text a valuable reference for researchers in algebra and related areas and a source for graduate and postgraduate students wishing to learn more about representation theory by self-study.

**Emmy Noether –
Mathematician**

Extraordinaire - David
E. Rowe 2021-01-09

Although she was famous as the "mother of modern algebra," Emmy Noether's life and work have never been the subject of an authoritative scientific biography. Emmy Noether – Mathematician Extraordinaire represents the most comprehensive study of this singularly important mathematician to date. Focusing on key turning points, it aims to provide an overall interpretation of Noether's intellectual development while

offering a new assessment of her role in transforming the mathematics of the twentieth century. Hermann Weyl, her colleague before both fled to the United States in 1933, fully recognized that Noether's dynamic school was the very heart and soul of the famous Göttingen community. Beyond her immediate circle of students, Emmy Noether's lectures and seminars drew talented mathematicians from all over the world. Four of the most important were B.L. van der Waerden, Pavel Alexandrov, Helmut Hasse, and Olga Taussky. Noether's classic papers on ideal theory inspired van der Waerden to recast his research in algebraic geometry. Her lectures on group theory motivated Alexandrov to develop links between point set topology and combinatorial methods.

Noether's vision for a new approach to algebraic number theory gave Hasse the impetus to pursue a line of research that led to the Brauer–Hasse–Noether Theorem, whereas her abstract style clashed with Taussky's approach to classical class field theory during a difficult time when both were trying to find their footing in a foreign country. Although similar to *Proving It Her Way: Emmy Noether, a Life in Mathematics*, this lengthier study addresses mathematically minded readers. Thus, it presents a detailed analysis of Emmy Noether's work with Hilbert and Klein on mathematical problems connected with Einstein's theory of relativity. These efforts culminated with her famous paper "Invariant Variational

Problems," published one year before she joined the Göttingen faculty in 1919.

The Scientific Legacy of Poincare - Éric

Charpentier 2010

Henri Poincare

(1854-1912) was one of the greatest scientists of his time, perhaps the last one to have mastered and expanded almost all areas in mathematics and theoretical physics. In this book, twenty world experts present one part of Poincare's extraordinary work. Each chapter treats one theme, presenting Poincare's approach, and achievements.

Pearls from a Lost City

- Roman Duda 2014-08-07

The fame of the Polish school at Lvov rests with the diverse and fundamental contributions of Polish mathematicians working there during the interwar years. In

particular, despite material hardship and without a notable mathematical tradition, the school made major contributions to what is now called functional analysis. The results and names of Banach, Kac, Kuratowski, Mazur, Nikodym, Orlicz, Schauder, Sierpiński, Steinhaus, and Ulam, among others, now appear in all the standard textbooks. The vibrant joie de vivre and singular ambience of Lvov's once scintillating social scene are evocatively recaptured in personal recollections. The heyday of the famous Scottish Café-- unquestionably the most mathematically productive cafeteria of all time--and its precious Scottish Book of highly influential problems are described in detail, revealing the special synergy of

scholarship and camaraderie that permanently elevated Polish mathematics from utter obscurity to global prominence. This chronicle of the Lvov school--its legacy and the tumultuous historical events which defined its lifespan--will appeal equally to mathematicians, historians, or general readers seeking a cultural and institutional overview of key aspects of twentieth-century Polish mathematics not described anywhere else in the extant English-language literature.

A Theory of Scattering for Quasifree Particles

- Raymond F Streater

2014-07-31

In this book, the author presents the theory of quasifree quantum fields and argues that they could provide non-zero scattering for some particles. The free-

field representation of the quantised transverse electromagnetic field is not closed in the weak*-topology. Its closure contains soliton-anti-soliton pairs as limits of two-photon states as time goes to infinity, and the overlap probability can be computed using Uhlmann's prescription. There are no free parameters: the probability is determined with no requirement to specify any coupling constant. All cases of the Shale transforms of the free field ϕ of the form $\phi \rightarrow \phi + \phi$, where ϕ is not in the one-particle space, are treated in the book. There remain the cases of the Shale transforms of the form $\phi \rightarrow T\phi$, where T is a symplectic map on the one-particle space, not near the identity. Contents: Introduction Haag-Kastler Fields Representations of the Poincaré Group The

Maxwell Field Some
Theory of
RepresentationsEuclidean
ElectrodynamicsModelsCon
clusion Readership:
Graduate students and
professional in particle
and mathematical
physics. Key
Features:There are no
competing titles for
this
bookKeywords:Relativisti
c Quasifree
Representation of
Transverse
Electromagnetic
Field;Quasi-Free
Scattering;Quantum
Scattering;Relativistic
Quantum Field
Theory;Quasi-Free
Quantum Field Theory;C*-
Algebra;Euclidean
Electrodynamics;Haag-
Ruelle Theory;Haag-
Kastler Axioms;Segal-
Bargmann Transform;Shale
Transformation
The St. Petersburg
School of Number Theory
- Boris Nikolaevich
Delone
"With a Foreword written

for the English edition,
this volume will appeal
to a broad mathematical
audience, including
mathematical historians
and mathematicians
working in number
theory."--BOOK JACKET.
*The Mathematics of
Frobenius in Context* -
Thomas Hawkins
2013-07-23
Frobenius made many
important contributions
to mathematics in the
latter part of the 19th
century. Hawkins here
focuses on his work in
linear algebra and its
relationship with the
work of Burnside,
Cartan, and Molien, and
its extension by Schur
and Brauer. He also
discusses the Berlin
school of mathematics
and the guiding force of
Weierstrass in that
school, as well as the
fundamental work of
d'Alembert, Lagrange,
and Laplace, and of
Gauss, Eisenstein and
Cayley that laid the

groundwork for Frobenius's work in linear algebra. The book concludes with a discussion of Frobenius's contribution to the theory of stochastic matrices.

An Invitation to Representation Theory -

R. Michael Howe
2022-05-28

An Invitation to Representation Theory offers an introduction to groups and their representations, suitable for undergraduates. In this book, the ubiquitous symmetric group and its natural action on polynomials are used as a gateway to representation theory. The subject of representation theory is one of the most connected in mathematics, with applications to group theory, geometry, number theory and combinatorics, as well

as physics and chemistry. It can however be daunting for beginners and inaccessible to undergraduates. The symmetric group and its natural action on polynomial spaces provide a rich yet accessible model to study, serving as a prototype for other groups and their representations. This book uses this key example to motivate the subject, developing the notions of groups and group representations concurrently. With prerequisites limited to a solid grounding in linear algebra, this book can serve as a first introduction to representation theory at the undergraduate level, for instance in a topics class or a reading course. A substantial amount of content is presented in over 250 exercises with complete

solutions, making it well-suited for guided study.

Actions of Groups - John McCleary 2022-12-31

An undergraduate text with an active learning approach introducing representation theory and Galois theory topics using group actions.

The Case of Academician Nikolai Nikolaevich

Luzin - Sergei S. Demidov 2016-05-25

The Soviet school, one of the glories of twentieth-century mathematics, faced a serious crisis in the summer of 1936. It was suffering from internal strains due to generational conflicts between the young talents and the old establishment. At the same time, Soviet leaders (including Stalin himself) were bent on "Sovietizing" all of science in the USSR by requiring scholars to publish

their works in Russian in the Soviet Union, ending the nearly universal practice of publishing in the West. A campaign to "Sovietize" mathematics in the USSR was launched with an attack on Nikolai Nikolaevich Luzin, the leader of the Soviet school of mathematics, in Pravda. Luzin was fortunate in that only a few of the most ardent ideologues wanted to destroy him utterly. As a result, Luzin, though humiliated and frightened, was allowed to make a statement of public repentance and then let off with a relatively mild reprimand. A major factor in his narrow escape was the very abstractness of his research area (descriptive set theory), which was difficult to incorporate into a propaganda campaign aimed at the

broader public. The present book contains the transcripts of five meetings of the Academy of Sciences commission charged with investigating the accusations against Luzin, meetings held in July of 1936. Ancillary material from the Soviet press of the time is included to place these meetings in context.

The Life and Times of the Central Limit

Theorem - William J. Adams 2009-11-25

About the First Edition: The study of any topic becomes more meaningful if one also studies the historical development that resulted in the final theorem. ... This is an excellent book on mathematics in the making. --Philip Peak, The Mathematics Teacher, May, 1975 I find the book very interesting. It contains valuable information and useful references. It can be

recommended not only to historians of science and mathematics but also to students of probability and statistics. --Wei-Ching Chang, *Historica Mathematica*, August, 1976 In the months since I wrote ... I have read it from cover to cover at least once and perused it here and there a number of times. I still find it a very interesting and worthwhile contribution to the history of probability and statistics. --Churchill Eisenhart, past president of the American Statistical Association, in a letter to the author, February 3, 1975 The name Central Limit Theorem covers a wide variety of results involving the determination of necessary and sufficient conditions under which sums of independent random variables,

suitably standardized, have cumulative distribution functions close to the Gaussian distribution. As the name Central Limit Theorem suggests, it is a centerpiece of probability theory which also carries over to statistics. Part One of The Life and Times of the Central Limit Theorem, Second Edition traces its fascinating history from seeds sown by Jacob Bernoulli to use of integrals of $\exp(x^2)$ as an approximation tool, the development of the theory of errors of observation, problems in mathematical astronomy, the emergence of the hypothesis of elementary errors, the fundamental work of Laplace, and the emergence of an abstract Central Limit Theorem through the work of Chebyshev, Markov and Lyapunov. This closes the classical period of

the life of the Central Limit Theorem, 1713-1901. The second part of the book includes papers by Feller and Le Cam, as well as comments by Doob, Trotter, and Pollard, describing the modern history of the Central Limit Theorem (1920-1937), in particular through contributions of Lindeberg, Cramer, Levy, and Feller. The Appendix to the book contains four fundamental papers by Lyapunov on the Central Limit Theorem, made available in English for the first time.

Pioneers of Representation Theory: Frobenius, Burnside, Schur, and Brauer - Charles W. Curtis 1999
The AMS History of Mathematics series is one of the most popular items for bookstore sales. These books feature colorful,

attractive covers that are perfect for face out displays. The topics will appeal to a broad audience in the mathematical and scientific communities.

Pioneering Women in American Mathematics -

Judy Green 2009-01

More than 14 percent of the PhD's awarded in the United States during the first four decades of the twentieth century went to women, a proportion not achieved again until the 1980s. This book is the result of a study in which the authors identified all of the American women who earned PhD's in mathematics before 1940, and collected extensive biographical and bibliographical information about each of them. By reconstructing as complete a picture as possible of this group of women, Green and LaDuke reveal insights

into the larger scientific and cultural communities in which they lived and worked.

The book contains an extended introductory essay, as well as biographical entries for each of the 228 women in the study. The authors examine family backgrounds, education, careers, and other professional activities. They show that there were many more women earning PhD's in mathematics before 1940 than is commonly thought. Extended biographies and bibliographical information are available from the companion website for the book:

www.ams.org/bookpages/hmath-34. The material will be of interest to researchers, teachers, and students in mathematics, history of science, women's

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www.ams.org/bookpages/hmath-34. The material will be of interest to researchers, teachers, and students in mathematics, history of science, women's

studies, and sociology. The data presented about each of the 228 individual members of the group will support additional study and analysis by scholars in a large number of disciplines.

Representation Theory - Amritanshu Prasad 2015-02-05

This book examines the fundamental results of modern combinatorial representation theory. The exercises are interspersed with text to reinforce readers' understanding of the subject. In addition, each exercise is assigned a difficulty level to test readers' learning. Solutions and hints to most of the exercises are provided at the end.

Tensor-Valued Random Fields for Continuum Physics - Anatoliy Malyarenko 2018-12-06
Presents a complete description of

homogenous and isotropic tensor-valued random fields, including the problems of continuum physics, mathematical tools and applications.

A Course in Analytic Number Theory - Marius Overholt 2014-12-30

This book is an introduction to analytic number theory suitable for beginning graduate students. It covers everything one expects in a first course in this field, such as growth of arithmetic functions, existence of primes in arithmetic progressions, and the Prime Number Theorem. But it also covers more challenging topics that might be used in a second course, such as the Siegel-Walfisz theorem, functional equations of L-functions, and the explicit formula of von Mangoldt. For students with an interest in Diophantine analysis,

there is a chapter on the Circle Method and Waring's Problem. Those with an interest in algebraic number theory may find the chapter on the analytic theory of number fields of interest, with proofs of the Dirichlet unit theorem, the analytic class number formula, the functional equation of the Dedekind zeta function, and the Prime Ideal Theorem. The exposition is both clear and precise, reflecting careful attention to the needs of the reader. The text includes extensive historical notes, which occur at the ends of the chapters. The exercises range from introductory problems and standard problems in analytic number theory to interesting original problems that will challenge the reader. The author has made an effort to provide clear explanations for the

techniques of analysis used. No background in analysis beyond rigorous calculus and a first course in complex function theory is assumed.

The Collected Papers of William Burnside: Commentary on Burnside's life and work ; Papers 1883-1899 - William Burnside 2004

William Burnside was one of the three most important algebraists who were involved in the transformation of group theory from its nineteenth-century origins to a deep twentieth-century subject. Building on work of earlier mathematicians, they were able to develop sophisticated tools for solving difficult problems. All of Burnside's papers are reproduced here, organized chronologically and with a detailed bibliography.

Walter Feit has contributed a foreword, and a collection of introductory essays are included to provide a commentary on Burnside's work and set it in perspective along with a modern biography that draws on archive material.

Research in History and Philosophy of Mathematics - Maria Zack
2016-12-15

This volume contains seventeen papers that were presented at the 2015 Annual Meeting of the Canadian Society for History and Philosophy of Mathematics/La Société Canadienne d'Histoire et de Philosophie des Mathématiques, held in Washington, D.C. In addition to showcasing rigorously reviewed modern scholarship on an interesting variety of general topics in the history and philosophy of mathematics, this

meeting also honored the memories of Jacqueline (Jackie) Stedall and Ivor Grattan-Guinness; celebrated the Centennial of the Mathematical Association of America; and considered the importance of mathematical communities in a special session. These themes and many others are explored in these collected papers, which cover subjects such as New evidence that the Latin translation of Euclid's Elements was based on the Arabic version attributed to al-Ḥajjāj Work done on the arc rampant in the seventeenth century The history of numerical methods for finding roots of nonlinear equations An original play featuring a dialogue between George Boole and Augustus De Morgan that explores the relationship between

them Key issues in the digital preservation of mathematical material for future generations A look at the first twenty-five years of The American Mathematical Monthly in the context of the evolving American mathematical community The growth of Math Circles and the unique ways they are being implemented in the United States Written by leading scholars in the field, these papers will be accessible to not only mathematicians and students of the history and philosophy of mathematics, but also anyone with a general interest in mathematics.

Mathematics across the Iron Curtain -
Christopher Hollings
2014-07-16

The theory of semigroups is a relatively young branch of mathematics, with most of the major results having appeared after the Second World

War. This book describes the evolution of (algebraic) semigroup theory from its earliest origins to the establishment of a full-fledged theory. Semigroup theory might be termed 'Cold War mathematics' because of the time during which it developed. There were thriving schools on both sides of the Iron Curtain, although the two sides were not always able to communicate with each other, or even gain access to the other's publications. A major theme of this book is the comparison of the approaches to the subject of mathematicians in East and West, and the study of the extent to which contact between the two sides was possible.

Doing Mathematics -
Martin H Krieger
2015-01-15
Doing Mathematics

discusses some ways mathematicians and mathematical physicists do their work and the subject matters they uncover and fashion. The conventions they adopt, the subject areas they delimit, what they can prove and calculate about the physical world, and the analogies they discover and employ, all depend on the mathematics – what will work out and what won't. The cases studied include the central limit theorem of statistics, the sound of the shape of a drum, the connections between algebra and topology, and the series of rigorous proofs of the stability of matter. The many and varied solutions to the two-dimensional Ising model of ferromagnetism make sense as a whole when they are seen in an analogy developed by Richard Dedekind in the

1880s to algebraicize Riemann's function theory; by Robert Langlands' program in number theory and representation theory; and, by the analogy between one-dimensional quantum mechanics and two-dimensional classical statistical mechanics. In effect, we begin to see "an identity in a manifold presentation of profiles," as the phenomenologists would say. This second edition deepens the particular examples; it describe the practical role of mathematical rigor; it suggests what might be a mathematician's philosophy of mathematics; and, it shows how an "ugly" first proof or derivation embodies essential features, only to be appreciated after many subsequent proofs. Natural scientists and mathematicians trade

physical models and abstract objects, remaking them to suit their needs, discovering new roles for them as in the recent case of the Painlevé transcendents, the Tracy-Widom distribution, and Toeplitz determinants. And mathematics has provided the models and analogies, the ordinary language, for describing the everyday world, the structure of cities, or God's infinitude.

Contents: Introduction
Convention: How Means and Variances are Entrenched as Statistics
Subject: The Fields of Topology
Appendix: The Two-Dimensional Ising Model of a Ferromagnet
Calculation: Strategy, Structure, and Tactics in Applying Classical Analysis
Analogy: A Syzygy Between a Research Program in Mathematics and a Research Program in

Physics
In Concreto: The City of Mathematics
Appendices: The Spontaneous Magnetization of a Two-Dimensional Ising Model (C N Yang)
On the Dirac and Schwinger Corrections to the Ground-State Energy of an Atom (C Fefferman and L A Seco)
Sur la Forme des Espaces Topologiques et sur les Points Fixes des Représentations (J Leray)
Une Lettre à Simone Weil (A Weil)

Readership: Mathematicians, physicists, philosophers and historians of science. Keywords: Means and Variances; Topology; Syzygy
Reviews: Reviews of the First Edition: "The book Doing Mathematics, by Martin Krieger is truly a masterpiece. He has not only explained ways of doing mathematical work to aspiring mathematicians and the intelligent laymen, but

has also shown how various pieces of research work are related to each other. Even experts may not have realized such inter-relations. The cases studied include, especially, the stability of matter and the Ising model, two topics of great depth. Such clear explanations cannot be found anywhere else. Furthermore, his style of writing makes the book exceptionally enjoyable to read." T T Wu Gordon McKay Professor of Applied Physics Professor of Physics, Harvard University, USA "This is the first time I have seen a mathematician deal substantively with the issue of mathematics as culturally based, and he does it superbly and mathematically ... Although this book is no easy read, it is well worth the effort, and I am sure it will

stimulate and inform, perhaps even surprise, the most sophisticated of mathematical readers. It is refreshing to find such a book being published." Mathematical Reviews "Both challenging and provocative reading, Doing Mathematics sheds bright light on some of the main characteristics of the mathematical quest." Library of Science "Krieger has made some effort to accommodate different levels of readers; for example, structuring his text so that lay readers are alerted to sections that can be safely skipped and paragraphs that provide nontechnical summaries." Mathematical Association of America
Contributions to Probability and Statistics: Applications and Challenges -
Enumerative

Combinatorics: Volume 2

- Richard P. Stanley
1997

An introduction, suitable for beginning graduate students, showing connections to other areas of mathematics.

Logic's Lost Genius -
Eckart Menzler-Trott
2016-05-05

Gerhard Gentzen (1909–1945) is the founder of modern structural proof theory. His lasting methods, rules, and structures resulted not only in the technical mathematical discipline called “proof theory” but also in verification programs that are essential in computer science. The appearance, clarity, and elegance of Gentzen's work on natural deduction, the sequent calculus, and ordinal proof theory continue to be impressive even today. The present book gives the first

comprehensive, detailed, accurate scientific biography expounding the life and work of Gerhard Gentzen, one of our greatest logicians, until his arrest and death in Prague in 1945. Particular emphasis in the book is put on the conditions of scientific research, in this case mathematical logic, in National Socialist Germany, the ideological fight for “German logic”, and their mutual protagonists. Numerous hitherto unpublished sources, family documents, archival material, interviews, and letters, as well as Gentzen's lectures for the mathematical public, make this book an indispensable source of information on this important mathematician, his work, and his time. The volume is completed by two deep substantial essays by Jan von Plato and Craig Smoryński on

Gentzen's proof theory; its relation to the ideas of Hilbert, Brouwer, Weyl, and Gödel; and its development up to the present day. Smoryński explains the Hilbert program in more than the usual slogan form and shows why consistency is important. Von Plato shows in detail the benefits of Gentzen's program. This important book is a self-contained starting point for any work on Gentzen and his logic. The book is accessible to a wide audience with different backgrounds and is suitable for general readers, researchers, students, and teachers.

Yakov G. Berkovich; Lev S. Kazarin; Emmanuel M. Zhmud': Characters of Finite Groups. Volume 2

- Yakov G. Berkovich
2018-12-17

This updated edition of this classic book is devoted to ordinary

representation theory and is addressed to finite group theorists intending to study and apply character theory. It contains many exercises and examples, and the list of problems contains a number of open questions.

Number Theory - W.A. Coppel 2009-08-12

Number Theory is more than a comprehensive treatment of the subject. It is an introduction to topics in higher level mathematics, and unique in its scope; topics from analysis, modern algebra, and discrete mathematics are all included. The book is divided into two parts. Part A covers key concepts of number theory and could serve as a first course on the subject. Part B delves into more advanced topics and an exploration of related mathematics. The

prerequisites for this self-contained text are elements from linear algebra. Valuable references for the reader are collected at the end of each chapter. It is suitable as an introduction to higher level mathematics for undergraduates, or for self-study.

Group Matrices, Group Determinants and Representation Theory -

Kenneth W. Johnson
2019-11-08

This book sets out an account of the tools which Frobenius used to discover representation theory for nonabelian groups and describes its modern applications. It provides a new viewpoint from which one can examine various aspects of representation theory and areas of application, such as probability theory and harmonic analysis. For example, the focal objects of this book,

group matrices, can be thought of as a generalization of the circulant matrices which are behind many important algorithms in information science. The book is designed to appeal to several audiences, primarily mathematicians working either in group representation theory or in areas of mathematics where representation theory is involved. Parts of it may be used to introduce undergraduates to representation theory by studying the appealing pattern structure of group matrices. It is also intended to attract readers who are curious about ideas close to the heart of group representation theory, which do not usually appear in modern accounts, but which offer new perspectives.

Guide to Information Sources in Mathematics

and Statistics - Martha A. Tucker 2004
Publisher description:
This book is a reference for librarians, mathematicians, and statisticians involved in college and research level mathematics and statistics in the 21st century. Part I is a historical survey of the past 15 years tracking this huge transition in scholarly communications in mathematics. Part II of the book is the bibliography of resources recommended to support the disciplines of mathematics and statistics. These resources are grouped by material type. Publication dates range from the 1800's onwards. Hundreds of electronic resources-some online, both dynamic and static, some in fixed media, are listed among the paper resources. A majority of listed electronic resources are free.

The War of Guns and Mathematics - David Aubin 2014-10-07
For a long time, World War I has been shortchanged by the historiography of science. Until recently, World War II was usually considered as the defining event for the formation of the modern relationship between science and society. In this context, the effects of the First World War, by contrast, were often limited to the massive deaths of promising young scientists. By focusing on a few key places (Paris, Cambridge, Rome, Chicago, and others), the present book gathers studies representing a broad spectrum of positions adopted by mathematicians about the conflict, from militant pacifism to military, scientific, or ideological mobilization. The use of

mathematics for war is thoroughly examined. This book suggests a new vision of the long-term influence of World War I on mathematics and mathematicians. Continuities and discontinuities in the structure and organization of the mathematical sciences are discussed, as well as their images in various milieux. Topics of research and the values with which they were defended are scrutinized. This book, in particular, proposes a more in-depth evaluation of the issue of modernity and modernization in mathematics. The issue of scientific international relations after the war is revisited by a close look at the situation in a few Allied countries (France, Britain, Italy, and the USA). The historiography has

emphasized the place of Germany as the leading mathematical country before WWI and the absurdity of its postwar ostracism by the Allies. The studies presented here help explain how dramatically different prewar situations, prolonged interaction during the war, and new international postwar organizations led to attempts at redrafting models for mathematical developments.

Lectures on Number

Theory - Peter Gustav Lejeune Dirichlet

This volume is a translation of Dirichlet's *Vorlesungen über Zahlentheorie* which includes nine supplements by Dedekind and an introduction by John Stillwell, who translated the volume. *Lectures on Number Theory* is the first of its kind on the subject matter. It covers most of the topics that are

standard in a modern first course on number theory, but also includes Dirichlet's famous results on class numbers and primes in arithmetic progressions. The book is suitable as a textbook, yet it also offers a fascinating historical perspective that links Gauss with modern number theory.

Volume 1 - Yakov G.

Berkovich 2017-12-18

This updated edition of this classic book is devoted to ordinary representation theory and is addressed to finite group theorists intending to study and apply character theory. It contains many exercises and examples, and the list of problems contains a number of open questions.

Representing Finite Groups - Ambar N.

Sengupta 2011-12-08

This graduate textbook presents the basics of representation theory

for finite groups from the point of view of semisimple algebras and modules over them. The presentation interweaves insights from specific examples with development of general and powerful tools based on the notion of semisimplicity. The elegant ideas of commutant duality are introduced, along with an introduction to representations of unitary groups. The text progresses systematically and the presentation is friendly and inviting. Central concepts are revisited and explored from multiple viewpoints. Exercises at the end of the chapter help reinforce the material. Representing Finite Groups: A Semisimple Introduction would serve as a textbook for graduate and some advanced undergraduate courses in mathematics.

Prerequisites include acquaintance with elementary group theory and some familiarity with rings and modules. A final chapter presents a self-contained account of notions and results in algebra that are

used. Researchers in mathematics and mathematical physics will also find this book useful. A separate solutions manual is available for instructors.