Atlas Of Finite Groups Maximal Subgroups And Ordin

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Contributions to Automorphic Forms, Geometry, and Number Theory Haruzo Hida 2004-03-11 In Contributions to Automorphic Forms, Geometry, and Number Theory, Haruzo Hida, Dinakar Ramakrishnan, and Freydoon Shahidi bring together a distinguished group of experts to explore automorphic forms, principally via the associated L-functions, representation theory, and geometry. Because these themes are at the cutting edge of a central area of modern mathematics, and are related to the philosophical base of Wiles' proof of Fermat's last theorem, this book will be of interest to working mathematicians and students alike. Never previously published, the contributions to this volume expose the reader to a host of difficult and thought-provoking problems. Each of the extraordinary and noteworthy mathematicians in this volume makes a unique contribution to a field that is currently seeing explosive growth. New and powerful results are being proved, radically and continually changing the field's make up. Contributions to Automorphic Forms, Geometry, and Number Theory will likely lead to vital interaction among researchers and also help prepare students and other young mathematicians to enter this exciting area of pure mathematics. Contributors: Jeffrey Adams, Jeffrey D. Adler, James Arthur, Don Blasius, Siegfried Boecherer, Daniel Bump, William Casselmann, Laurent Clozel, James Cogdell, Laurence Corwin, Solomon Friedberg, Masaaki Furusawa, Benedict Gross, Thomas Hales, Joseph Harris, Michael Harris, Jeffrey Hoffstein, Hervⓟ Jacquet, Dihua Jiang, Nicholas Katz, Henry Kim, Victor Kreiman, Stephen Kudla, Philip Kutzko, V. Lakshmibai, Robert Langlands, Erez Lapid, Ilya Piatetski-Shapiro, Dipendra Prasad, Stephen Rallis, Dinakar Ramakrishnan, Paul Sally, Freydoon Shahidi, Peter Sarnak, Rainer Schulze-Pillot, Joseph Shalika, David Soudry, Ramin Takloo-Bigash, Yuri Tschinkel, Emmanuel Ullmo, Marie-France Vignⓟ ras, Jean-Loup Waldspurger.

Expansion in Finite Simple Groups of Lie Type Terence Tao 2015-04-16 Expander graphs are an important tool in theoretical computer science, geometric group theory, probability, and number theory. Furthermore, the techniques used to rigorously establish the expansion property of a graph draw from such diverse areas of mathematics as representation theory, algebraic geometry, and arithmetic combinatorics. This text focuses on the latter topic in the important case of Cayley graphs on finite groups of Lie type, developing tools such as Kazhdan's property (T), quasirandomness, product estimates, escape from subvarieties, and the Balog-Szemerⓟ di-Gowers lemma. Applications to the affine sieve of Bourgain, Gamburd, and Sarnak are also given. The material is largely self-contained, with additional sections on the general theory of expanders, spectral theory, Lie theory, and the Lang-Weil bound, as well as numerous exercises and other optional material.

Buildings and the Geometry of Diagrams Luigi A. Rosati 2006-11-14

Proceedings of Groups - St. Andrews 1985 E. F. Robertson 1986 A current picture of progress and research in group theory is provided by five leading group theorists Bachmuth, Baumslag, Neumann, Roseblade and Tits.

Arithmetical Similarities Norbert Klingen 1998 Focusing on fruitful exchanges between group theory and number theory, this book examines recent work in the characterization of extensions of number fields in terms of the decomposition of prime ideals. A key problem in this area is establishing the equality of Dedekind zeta functions of different number fields. This problem was solved for abelian extensions by class field theory, but was little studied in its general form until 1970. Recent progress has been based on important results in group theory, particularly

the complete classification of all finite simple groups. This book provides an overview of this progress in algebraic number theory; it contains previously unpublished work as well as numerous results appearing in monograph form the first time.

Cherlin's Conjecture for Finite Primitive Binary Permutation Groups Nick Gill 2022-07-18 This book gives a proof of Cherlin's conjecture for finite binary primitive permutation groups. Motivated by the part of model theory concerned with Lachlan's theory of finite homogeneous relational structures, this conjecture proposes a classification of those finite primitive permutation groups that have relational complexity equal to 2. The first part gives a full introduction to Cherlin's conjecture, including all the key ideas that have been used in the literature to prove some of its special cases. The second part completes the proof by dealing with primitive permutation groups that are almost simple with socle a group of Lie type. A great deal of material concerning properties of primitive permutation groups and almost simple groups is included, and new ideas are introduced. Addressing a hot topic which cuts across the disciplines of group theory, model theory and logic, this book will be of interest to a wide range of readers. It will be particularly useful for graduate students and researchers who need to work with simple groups of Lie type.

On Non-Generic Finite Subgroups of Exceptional Algebraic Groups Alastair J. Litterick 2018-05-29

Blocks of Finite Groups and Their Invariants Benjamin Sambale 2014-11-19 Providing a nearly complete selection of up-to-date methods and results on block invariants with respect to their defect groups, this book covers the classical theory pioneered by Brauer, the modern theory of fusion systems introduced by Puig, the geometry of numbers developed by Minkowski, the classification of finite simple groups, and various computer assisted methods. In a powerful combination, these tools are applied to solve many special cases of famous open conjectures in the representation theory of finite groups. Most of the material is drawn from peer-reviewed journal articles, but there are also new previously unpublished results. In order to make the text self-contained, detailed proofs are given whenever possible. Several tables add to the text's usefulness as a reference. The book is aimed at experts in group theory or representation theory who may wish to make use of the presented ideas in their research.

Computational Algebra and Number Theory Wieb Bosma 2013-03-09 Computers have stretched the limits of what is possible in mathematics. More: they have given rise to new fields of mathematical study; the analysis of new and traditional algorithms, the creation of new paradigms for implementing computational methods, the viewing of old techniques from a concrete algorithmic vantage point, to name but a few. Computational Algebra and Number Theory lies at the lively intersection of computer science and mathematics. It highlights the surprising width and depth of the field through examples drawn from current activity, ranging from category theory, graph theory and combinatorics, to more classical computational areas, such as group theory and number theory. Many of the papers in the book provide a survey of their topic, as well as a description of present research. Throughout the variety of mathematical and computational fields represented, the emphasis is placed on the common principles and the methods employed. Audience: Students, experts, and those performing current research in any of the topics mentioned above.

The Subgroup Structure of the Finite Classical Groups Peter B. Kleidman 1990-04-26 With the classification of the finite simple groups complete, much work has gone into the study of maximal subgroups of almost simple groups. In this volume the authors investigate the maximal subgroups of the finite classical groups and present research into these groups as well as proving many new results. In particular, the authors develop a unified treatment of the theory of the 'geometric subgroups' of the classical groups, introduced by Aschbacher, and they answer the questions of maximality and conjugacy and obtain the precise shapes of these groups. Both authors are experts in the field and the book will be of considerable value not only to group theorists, but also to combinatorialists and geometers interested in these techniques and results. Graduate students will find it a very readable introduction to the topic and it will bring them to the very forefront of research in group theory.

Classical Groups and Related Topics Luogeng Hua 1989

Encyclopaedia of Mathematics Michiel Hazewinkel 2012-12-06 This ENCYCLOPAEDIA OF MATHEMATICS aims to be a reference work for all parts of mathematics. It is a translation with updates and editorial comments of the Soviet Mathematical Encyclopaedia published by 'Soviet Encyclopaedia Publishing House' in five volumes in

1977-1985. The annotated translation consists of ten volumes including a special index volume. There are three kinds of articles in this ENCYCLOPAEDIA. First of all there are survey-type articles dealing with the various main directions in mathematics (where a rather fine subdivi sion has been used). The main requirement for these articles has been that they should give a reasonably complete up-to-date account of the current state of affairs in these areas and that they should be maximally accessible. On the whole, these articles should be understandable to mathematics students in their first specialization years, to graduates from other mathematical areas and, depending on the specific subject, to specialists in other domains of science, en gineers and teachers of mathematics. These articles treat their material at a fairly general level and aim to give an idea of the kind of problems, techniques and concepts involved in the area in question. They also contain background and motivation rather than precise statements of precise theorems with detailed definitions and technical details on how to carry out proofs and constructions. The second kind of article, of medium length, contains more detailed concrete problems, results and techniques.

Groups St Andrews 2009 in Bath: Volume 2 C. M. Campbell 2011-06-16 Groups St Andrews 2009 was held in the University of Bath in August 2009 and this second volume of a two-volume book contains selected papers from the international conference. Five main lecture courses were given at the conference, and articles based on their lectures form a substantial part of the proceedings. This volume contains the contributions by Eammon O'Brien (Auckland), Mark Sapir (Vanderbilt) and Dan Segal (Oxford). Apart from the main speakers, refereed survey and research articles were contributed by other conference participants. Arranged in alphabetical order, these articles cover a wide spectrum of modern group theory. The regular proceedings of Groups St Andrews conferences have provided snapshots of the state of research in group theory throughout the past 30 years. Earlier volumes have had a major impact on the development of group theory and it is anticipated that this volume will be equally important.

Regular Algebra and Finite Machines John Horton Conway 2012-01-01 A world-famous mathematician explores Moore's theory of experiments, Kleene's theory of regular events and expressions, Kleene algebras, the differential calculus of events, factors and the factor matrix, and the theory of operators. Additional subjects include context-free languages, communicative regular algebra, axiomatic questions, and logical problems. Solutions to problems. 1971 edition.

Atlas of Finite Groups John Horton Conway 1985 This atlas covers groups from the families of the classification of finite simple groups. Recently updated incorporating corrections

Subgroup Complexes Stephen D. Smith 2011-11-10 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.

CRC Concise Encyclopedia of Mathematics Eric W. Weisstein 2002-12-12 Upon publication, the first edition of the CRC Concise Encyclopedia of Mathematics received overwhelming accolades for its unparalleled scope, readability, and utility. It soon took its place among the top selling books in the history of Chapman & Hall/CRC, and its popularity continues unabated. Yet also unabated has been the d

Recent Developments in the Inverse Galois Problem Michael D. Fried 1995 This book contains the refereed proceedings of the AMS-IMS-SIAM Joint Summer Research Conference on Recent Developments in the Inverse Galois Problem, held in July 1993 at the University of Washington, Seattle. A new review of Serre's Topics in Galois Theory serves as a starting point. The book describes the latest research on explicit presentation of the absolute Galois group of the rationals. Containing the first appearance of generalizations of modular curves, the book presents applications that demonstrate the full scope of the Inverse Galois Problem. In particular, the papers collected here show the ubiquity of the applications of the Inverse Galois Problem and its compelling significance. The book will serve as a guide to progress on the Inverse Galois Problem and as an aid in using this work in other areas of mathematics. This includes coding theory and other finite field applications. Group theory and a first course in algebraic curves are sufficient for understanding many papers in the volume. Graduate students will find this an

EXCELLENT REFERENCE TO CURRENT RESEARCH, AS IT CONTAINS A LIST OF PROBLEMS APPROPRIATE FOR THESIS MATERIAL IN ARITHMETIC GEOMETRY, ALGEBRAIC NUMBER THEORY, AND GROUP THEORY.

Finite and Locally Finite Groups B. Hartley 2012-12-06 This volume contains the proceedings of the NATO Advanced Study Institute on Finite and Locally Finite Groups held in Istanbul, Turkey, 14-27 August 1994, at which there were about 90 participants from some 16 different countries. The ASI received generous financial support from the Scientific Affairs Division of NATO. INTRODUCTION A locally finite group is a group in which every finite set of elements is contained in a finite subgroup. The study of locally finite groups began with Schur's result that a periodic linear group is, in fact, locally finite. The simple locally finite groups are of particular interest. In view of the classification of the finite simple groups and advances in representation theory, it is natural to pursue classification theorems for simple locally finite groups. This was one of the central themes of the Istanbul conference and significant progress is reported herein. The theory of simple locally finite groups intersects many areas of group theory and representation theory, so this served as a focus for several articles in the volume. Every simple locally finite group has what is known as a Kegel cover. This is a collection of pairs {(G , Ni) liE I}, where I is an index set, each group Gi is finite, i Ni

The Maximal Subgroups of the Low-Dimensional Finite Classical Groups John N. Bray 2013-07-25 Classifies the maximal subgroups of the finite groups of Lie type up to dimension 12, using theoretical and computational methods.

Groups and Symmetries John P. Harnad

Information Security, Coding Theory and Related Combinatorics Dean Crnković 2011 "Published in cooperation with NATO Emerging Security Challenges Division"--T.p.

Applications of Group Theory to Combinatorics Jack Koolen 2008-07-02 Applications of Group Theory to Combinatorics contains 11 survey papers from international experts in combinatorics, group theory and combinatorial topology. The contributions cover topics from quite a diverse spectrum, such as design theory, Belyi functions, group theory, transitive graphs, regular maps, and Hurwitz problems, and present the state

Groups St Andrews 2013 C. M. Campbell 2015-10-22 Leading researchers survey the latest developments in group theory and many related areas.

The Maximal Factorizations of the Finite Simple Groups and Their Automorphism Groups Martin W. Liebeck 1990 Factorizations of finite groups as a product of two proper subgroups arise naturally in several areas of group theory, geometry, and applications. In this book, the authors determine all factorizations of the finite simple groups and their automorphism groups as a product of two maximal subgroups. The proof involved detailed study of the geometry of simple groups, and there is a substantial introductory section presenting this material.

The Finite Simple Groups Robert Wilson 2009-12-14 Thisbookisintendedasanintroductiontoallthe?nitesimplegroups.During themonumentalstruggletoclassifythe?nitesimplegroups(andindeedsince), a huge amount of information about these groups has been accumulated. Conveyingthisinformationtothenextgenerationofstudentsandresearchers, not to mention those who might wish to apply this knowledge, has become a major challenge. With the publication of the two volumes by Aschbacher and Smith [12, 13] in 2004 we can reasonably regard the proof of the Classi?cation Theorem for Finite Simple Groups (usually abbreviated CFSG) as complete. Thus it is timely to attempt an overview of all the (non-abelian) ?nite simple groups in one volume. For expository purposes it is convenient to divide them into four basic types, namely the alternating, classical, exceptional and sporadic groups. The study of alternating groups soon develops into the theory of per- tation groups, which is well served by the classic text of Wielandt [170]and more modern treatments such as the comprehensive introduction by Dixon and Mortimer [53] and more specialised texts such as that of Cameron [19].

The Atlas of Finite Groups - Ten Years On Robert Curtis 1998-06-11 Proceedings containing twenty articles by leading experts in group theory and its applications.

The Maximal Subgroups of the Low-Dimensional Finite Classical Groups John N. Bray 2013-07-25 This book classifies the maximal subgroups of the almost simple finite classical groups in dimension up to 12; it also describes the maximal subgroups of the almost simple finite exceptional groups with socle one of Sz(q), G2(q), 2G2(q) or 3D4(q). Theoretical and computational tools are used throughout, with downloadable Magma code provided. The exposition contains a wealth of information on the structure and action of the geometric subgroups of classical groups, but the reader will also encounter methods for analysing the structure and maximality of almost simple subgroups of almost simple groups. Additionally, this book contains detailed information on using Magma to calculate with representations over number fields and finite fields. Featured within are previously unseen results and over 80 tables describing the maximal subgroups, making this volume an essential reference for researchers. It also functions as a graduate-level textbook on finite simple groups, computational group theory and representation theory.

Finite Simple Groups: Thirty Years of the Atlas and Beyond Manjul Bhargava 2017-07-24 Classification of Finite Simple Groups, one of the most monumental accomplishments of modern mathematics, was announced in 1983 with the proof completed in 2004. Since then, it has opened up a new and powerful strategy to approach and resolve many previously inaccessible problems in group theory, number theory, combinatorics, coding theory, algebraic geometry, and other areas of mathematics. This strategy crucially utilizes various information about finite simple groups, part of which is catalogued in the Atlas of Finite Groups (John H. Conway et al.), and in An Atlas of Brauer Characters (Christoph Jansen et al.). It is impossible to overestimate the roles of the Atlases and the related computer algebra systems in the everyday life of researchers in many areas of contemporary mathematics. The main objective of the conference was to discuss numerous applications of the Atlases and to explore recent developments and future directions of research, with focus on the interaction between computation and theory and applications to number theory and algebraic geometry. The papers in this volume are based on talks given at the conference. They present a comprehensive survey on current research in all of these fields.

Maximal $\textrm{PSL}_2$ Subgroups of Exceptional Groups of Lie Type David A. Craven 2022-04-08 View the abstract.

Imprimitive Irreducible Modules for Finite Quasisimple Groups Gerhard Hiss 2015-02-06 Motivated by the maximal subgroup problem of the finite classical groups the authors begin the classification of imprimitive irreducible modules of finite quasisimple groups over algebraically closed fields K. A module of a group G over K is imprimitive, if it is induced from a module of a proper subgroup of G. The authors obtain their strongest results when char(K)=0, although much of their analysis carries over into positive characteristic. If G is a finite quasisimple group of Lie type, they prove that an imprimitive irreducible KG-module is Harish-Chandra induced. This being true for \rm char(K) different from the defining characteristic of G, the authors specialize to the case char(K)=0 and apply Harish-Chandra philosophy to classify irreducible Harish-Chandra induced modules in terms of Harish-Chandra series, as well as in terms of Lusztig series. The authors determine the asymptotic proportion of the irreducible imprimitive KG-modules, when G runs through a series groups of fixed (twisted) Lie type. One of the surprising outcomes of their investigations is the fact that these proportions tend to 1, if the Lie rank of the groups tends to infinity. For exceptional groups G of Lie type of small rank, and for sporadic groups G, the authors determine all irreducible imprimitive KG-modules for arbitrary characteristic of K.

Groups St Andrews 2001 in Oxford: Volume 1 C. M. Campbell 2003-11-06 This first volume of the two-volume book contains selected papers from the international conference 'Groups St Andrews 2001 in Oxford' which was held at the University of Oxford in August 2001. Five main lecture courses were given at the conference, and articles based on their lectures form a substantial part of the Proceedings. This volume contains the contributions from Marston Conder (Auckland), Persi Diaconis (Stanford) and Marcus Du Sautoy (Cambridge). The series of Proceedings of Groups St Andrews conferences have provided snapshots of the state of research in group theory throughout the past twenty years. As with earlier volumes, these refereed volumes also contain accessible surveys of contemporary research fronts, as well as a diverse collection of short research articles. They form a valuable reference for researchers, especially graduate students, working in group theory.

Automorphisms of Fusion Systems of Finite Simple Groups of Lie Type Carles Broto 2020-02-13 For a finite group G of Lie type and a prime p, the authors compare the automorphism groups of the fusion and linking systems of G at p with the automorphism group of G itself. When p is the defining characteristic of G, they are all isomorphic, with

a very short list of exceptions. When p is different from the defining characteristic, the situation is much more complex but can always be reduced to a case where the natural map from Out(G) to outer automorphisms of the fusion or linking system is split surjective. This work is motivated in part by questions involving extending the local structure of a group by a group of automorphisms, and in part by wanting to describe self homotopy equivalences of BG⌃ p in terms of Out(G).

Canadian Journal of Mathematics 1993-02

Finite Group Theory I. Martin Isaacs 2008 The text begins with a review of group actions and Sylow theory. It includes semidirect products, the Schur-Zassenhaus theorem, the theory of commutators, coprime actions on groups, transfer theory, Frobenius groups, primitive and multiply transitive permutation groups, the simplicity of the PSL groups, the generalized Fitting subgroup and also Thompson's J-subgroup and his normal p-complement theorem. Topics that seldom (or never) appear in books are also covered. These include subnormality theory, a group-theoretic proof of Burnside's theorem about groups with order divisible by just two primes, the Wielandt automorphism tower theorem, Yoshida's transfer theorem, the ``principal ideal theorem'' of transfer theory and many smaller results that are not very well known. Proofs often contain original ideas, and they are given in complete detail. In many cases they are simpler than can be found elsewhere. The book is largely based on the author's lectures, and consequently, the style is friendly and somewhat informal. Finally, the book includes a large collection of problems at disparate levels of difficulty. These should enable students to practice group theory and not just read about it. Martin Isaacs is professor of mathematics at the University of Wisconsin, Madison. Over the years, he has received many teaching awards and is well known for his inspiring teaching and lecturing. He received the University of Wisconsin Distinguished Teaching Award in 1985, the Benjamin Smith Reynolds Teaching Award in 1989, and the Wisconsin Section MAA Teaching Award in 1993, to name only a few. He was also honored by being the selected MAA Polya Lecturer in 2003-2005.

Factorizations of Almost Simple Groups with a Solvable Factor, and Cayley Graphs of Solvable Groups Cai-Heng Li 2022-08-31 View the abstract.

Simon Alexander Masters 2012-02-28 Alexander Masters tripped over his first book subject on a Cambridge sidewalk, and the result was the multi-award-winning bestseller Stuart: A Life Backwards. His second, he's found under his floorboards. One of the greatest mathematical prodigies of the twentieth century, Simon Norton stomps around Alexander's basement in semidarkness, dodging between stalagmites of bus timetables and engorged plastic bags, eating tinned kippers stirred into packets of Bombay mix. Simon is exploring a theoretical puzzle so complex and critical to our understanding of the universe that it is known as the Monster. It looks like a sudoku table—except a sudoku table has nine columns of numbers. The Monster has 808017424794512875886459904961710757005754368000000000 columns. But that's not the whole story. What's inside the decaying sports bag he never lets out of his clutches? Why does he hurtle out of the house in the middle of the night? And—good God!—what is that noxious smell that creeps up the stairwell? Grumpy, poignant, comical—more intimate than either the author or his quarry intended—Simon: The Genius in My Basement is the story of a friendship and a pursuit. Part biography, part memoir, and part popular science, it is a study of the frailty of brilliance, the measures of happiness, and Britain's most uncooperative egghead eccentric.

The Arcata Conference on Representations of Finite Groups, Part 2 Calif.) Arcata Conference on Representations of Finite Groups (1986 : Arcata 1987

Surveys in Combinatorics 2005 Bridget S. Webb 2005-07-21 This volume provides an up-to-date overview of current research across combinatorics,.

Representation Theory of Finite Groups and Finite-Dimensional Algebras Michler 2012-12-06 From April 1, 1984 until March 31, 1991 the Deutsche Forschungsgemeinschaft has sponsored the project "Representation Theory of Finite Groups and Finite Di mensional Algebras". The proposal for this project was submitted by B. Huppert (Mainz), B. Fischer (Bielefeld), G. Michler (Essen), H. Pahlings (Aachen) and C. M. Ringel (Bielefeld) in order to strengthen the interaction between the different re search areas in representation theory. The Deutsche Forschungsgemeinschaft has given many research positions and fellowships for young algebraists enabling them to do research at their own uni versities or as visitors at well known research institutions in America, Australia, England and France. The

WHOLE PROJECT BENEFITTED VERY MUCH FROM AN EXTENSIVE EXCHANGE PROGRAMME BETWEEN GERMAN AND AMERICAN SCIENTISTS SPONSORED BY THE DEUTSCHE FORSCHUNGSGEMEINSCHAFT AND BY THE NATIONAL SCIENCE FOUNDATION OF THE UNITED STATES. THIS VOLUME PRESENTS LECTURES GIVEN IN A FINAL CONFERENCE AND REPORTS BY MEMBERS OF THE PROJECT. IT IS DIVIDED INTO TWO PARTS. THE FIRST PART CONTAINS SEVEN SURVEY ARTICLES DESCRIBING RECENT ADVANCES IN DIFFERENT AREAS OF REPRESENTATION THEORY. THESE ARTICLES DO NOT ONLY CONCENTRATE ON THE WORK DONE BY THE GERMAN RESEARCH GROUPS, BUT ALSO INFORM ON MAJOR DEVELOPMENTS OF THE SUBJECT AT ALL. THE VOLUME OMITS THOSE TOPICS ALREADY TREATED IN BOOK FORM. IN PARTICULAR, IT DOES NOT CONTAIN A SURVEY ON K.