Regular Complex Polytopes

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Applied Geometry and Discrete Mathematics - Peter Gritzmann 1991
This volume, published jointly with the Association for Computing Machinery, comprises a collection of research articles celebrating the occasion of Victor Klee's 65th birthday in September 1990. During his long career, Klee has made contributions to a wide variety of areas, such as discrete and computational geometry, convexity, combinatorics, graph theory, functional analysis, mathematical programming and optimization, and theoretical computer science. In addition, Klee made important contributions to mathematics, education, mathematical methods in economics and the decision sciences, applications of discrete mathematics in the biological and social sciences, and the transfer of knowledge from applied mathematics to industry. In honour of Klee's achievements, this volume presents more than 40 papers on topics related to Klee's research. While the majority of the papers are research articles, a number of survey articles are also included. Mirroring the breadth of Klee's mathematical contributions, this book shows how different branches of mathematics interact. It is a fitting tribute to one of the leading figures in discrete mathematics.
Arrangements of Hyperplanes - Peter Orlik 2013-03-09
An arrangement of hyperplanes is a finite collection of codimension one affine subspaces in a finite dimensional vector space. Arrangements have emerged independently as important objects in various fields of

mathematics such as combinatorics, braids, configuration spaces, representation theory, reflection groups, singularity theory, and in computer science and physics. This book is the first comprehensive study of the subject. It treats arrangements with methods from combinatorics, algebra, algebraic geometry, topology, and group actions. It emphasizes general techniques which illuminate the connections among the different aspects of the subject. Its main purpose is to lay the foundations of the theory. Consequently, it is essentially self-contained and proofs are provided. Nevertheless, there are several new results here. In particular, many theorems that were previously known only for central arrangements are proved here for the first time in completegenerality. The text provides the advanced graduate student entry into a vital and active area of research. The working mathematician will findthe book useful as a source of basic results of the theory, open problems, and a comprehensive bibliography of the subject.
Non-Euclidean Geometries - András Prékopa 2006-06-03
"From nothing I have created a new different world," wrote János Bolyai to his father, Wolgang Bolyai, on November 3, 1823, to let him know his discovery of non-Euclidean geometry, as we call it today. The results of Bolyai and the co-discoverer, the Russian Lobachevskii, changed the course of mathematics, opened the way for modern physical theories of the twentieth century, and had an impact on the history of human

culture. The papers in this volume, which commemorates the 200th anniversary of the birth of János Bolyai, were written by leading scientists of non-Euclidean geometry, its history, and its applications. Some of the papers present new discoveries about the life and works of János Bolyai and the history of non-Euclidean geometry, others deal with geometrical axiomatics; polyhedra; fractals; hyperbolic, Riemannian and discrete geometry; tilings; visualization; and applications in physics.

Generators and Relations for Discrete Groups - Harold S.M. Coxeter 2013-06-29
When we began to consider the scope of this book, we envisaged a catalogue supplying at least one abstract definition for any finitely generated group that the reader might propose. But we soon realized that more or less arbitrary restrictions are necessary, because interesting groups are so numerous. For permutation groups of degree 8 or less (i.e.' .subgroups of es), the reader cannot do better than consult the tables of JosEPHINE BuRNS (1915), while keeping an eye open for misprints. Our own tables (on pages 134-142) deal with groups of low order, finite and infinite groups of congruent transformations, symmetric and alternating groups, linear fractional groups, and groups generated by reflections in real Euclidean space of any number of dimensions. The best substitute for a more extensive catalogue is the description (in Chapter 2) of a method whereby the reader can easily work out his own abstract definition for almost any given finite group. This method is sufficiently mechanical for the use of an electronic computer.

ADEX Theory - Saul-Paul Sirag 2016-01-25
' This book shows how the ADE Coxeter graphs unify at least 20 different types of mathematical structures. These mathematical structures are of great utility in unified field theory, string theory, and other areas of physics. Contents:IntroductionThe Octahedral GroupThe Octahedral Double GroupThe McKay CorrespondenceLie Groups and Lie AlgebrasCoxeter''s Reflection GroupsThom–Arnold Catastrophe StructuresALE Spaces and Gravitational InstantonsKnots and Links and BraidsTwistors and ALE SpacesTwo-Dimensional Conformal Field TheoriesElliptic Curves and the Monster GroupSphere Packing and

Error-Correcting CodesQubits and Black HolesThe Holographic PrincipleCalabi–Yau Spaces and Mirror SymmetryHeisenberg AlgebrasSummary and OutlookBibliographyGlossaryIndex Readership: Researchers in mathematical physics. Keywords:ADE Graphs;ADE Groups;ADE Lattices;ADE Lie Algebras;ADE Singularities;ADE Catastrophes'

Regular Complex Polytopes - H. S. M. Coxeter 1991-04-26
The properties of regular solids exercise a fascination which often appeals strongly to the mathematically inclined, whether they are professionals, students or amateurs. In this classic book Professor Coxeter explores these properties in easy stages, introducing the reader to complex polyhedra (a beautiful generalization of regular solids derived from complex numbers) and unexpected relationships with concepts from various branches of mathematics: magic squares, frieze patterns, kaleidoscopes, Cayley diagrams, Clifford surfaces, crystallographic and non-crystallographic groups, kinematics, spherical trigonometry, and algebraic geometry. In the latter half of the book, these preliminary ideas are put together to describe a natural generalization of the Five Platonic Solids. This updated second edition contains a new chapter on Almost Regular Polytopes, with beautiful 'abstract art' drawings. New exercises and discussions have been added throughout the book, including an introduction to Hopf fibration and real representations for two complex polyhedra.

Convex Polytopes - Branko Grünbaum 2003-10
First Edition Prepared with the Cooperation of Victor Klee, Micha Perles, and Geoffrey C. Shephard

Handbook of Discrete and Computational Geometry, Second Edition - Csaba D. Toth 2004-04-13
While high-quality books and journals in this field continue to proliferate, none has yet come close to matching the Handbook of Discrete and Computational Geometry, which in its first edition, quickly became the definitive reference work in its field. But with the rapid growth of the discipline and the many advances made over the past seven years, it's time to bring this standard-setting reference up to date. Editors Jacob E.

Goodman and Joseph O'Rourke reassembled their stellar panel of contributors, added manymore, and together thoroughly revised their work to make the most important results and methods, both classic and cutting-edge, accessible in one convenient volume. Now over more then 1500 pages, the Handbook of Discrete and Computational Geometry, Second Edition once again provides unparalleled, authoritative coverage of theory, methods, and applications. Highlights of the Second Edition: Thirteen new chapters: Five on applications and others on collision detection, nearest neighbors in high-dimensional spaces, curve and surface reconstruction, embeddings of finite metric spaces, polygonal linkages, the discrepancy method, and geometric graph theory Thorough revisions of all remaining chapters Extended coverage of computational geometry software, now comprising two chapters: one on the LEDA and CGAL libraries, the other on additional software Two indices: An Index of Defined Terms and an Index of Cited Authors Greatly expanded bibliographies

Hamiltonian Submanifolds of Regular Polytopes - Felix Effenberger 2011
This work is set in the field of combinatorial topology, sometimes also referred to as discrete geometric topology, a field of research in the intersection of topology, geometry, polytope theory and combinatorics. The main objects of interest in the field are simplicial complexes that carry some additional structure, forming combinatorial triangulations of the underlying PL manifolds. In particular, polyhedral manifolds as subcomplexes of the boundary complex of a convex regular polytope are investigated. Such a subcomplex is called k-Hamiltonian if it contains the full k-skeleton of the polytope. The notion of tightness of a PL-embedding of a triangulated manifold is closely related to its property of being a Hamiltonian subcomplex of some convex polytope. Tightness of a triangulated manifold is a topological condition, roughly meaning that any simplex-wise linear embedding of the triangulation into Euclidean space is ``as convex as possible''. It can thus be understood as a generalization of the concept of convexity. In even dimensions, there exist purely combinatorial conditions which imply the tightness of a

triangulation. In this work, other sufficient and purely combinatorial conditions which can be applied to the odd-dimensional case as well are presented.

An Introduction to Convex Polytopes - Arne Brondsted 2012-12-06
The aim of this book is to introduce the reader to the fascinating world of convex polytopes. The highlights of the book are three main theorems in the combinatorial theory of convex polytopes, known as the Dehn-Sommerville Relations, the Upper Bound Theorem and the Lower Bound Theorem. All the background information on convex sets and convex polytopes which is m~eded to under stand and appreciate these three theorems is developed in detail. This background material also forms a basis for studying other aspects of polytope theory. The Dehn-Sommerville Relations are classical, whereas the proofs of the Upper Bound Theorem and the Lower Bound Theorem are of more recent date: they were found in the early 1970's by P. McMullen and D. Barnette, respectively. A famous conjecture of P. McMullen on the charac terization off-vectors of simplicial or simple polytopes dates from the same period; the book ends with a brief discussion of this conjecture and some of its relations to the Dehn-Sommerville Relations, the Upper Bound Theorem and the Lower Bound Theorem. However, the recent proofs that McMullen's conditions are both sufficient (L. J. Billera and C. W. Lee, 1980) and necessary (R. P. Stanley, 1980) go beyond the scope of the book. Prerequisites for reading the book are modest: standard linear algebra and elementary point set topology in [R1d will suffice.
Canadian Journal of Mathematics - 1953

Encyclopaedia of Mathematics - Michiel Hazewinkel 2012-12-06
This ENCYCLOPAEDIA OF MA THEMA TICS aims to be a reference work for all parts of mathe matics. 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.

The Geometric Vein - C. Davis 2012-12-06
Geometry has been defined as that part of mathematics which makes appeal to the sense of sight; but this definition is thrown in doubt by the existence of great geometers who were blind or nearly so, such as Leonhard Euler. Sometimes it seems that geometric methods in analysis, so-called, consist in having recourse to notions outside those apparently relevant, so that geometry must be the joining of unlike strands; but then what shall we say of the importance of axiomatic programmes in geometry, where reference to notions outside a restricted reper tory is banned? Whatever its definition, geometry clearly has been more than the sum of its results, more than the consequences of some few axiom sets. It has been a major current in mathematics, with a distinctive approach and a distinc ti v e spirit. A current, furthermore, which has not been constant. In the 1930s, after a period of pervasive prominence, it appeared to be in decline, even passe. These same years were those in which H. S. M. Coxeter was beginning his scientific work. Undeterred by the unfashionability of geometry, Coxeter pursued it with devotion and inspiration. By the 1950s he appeared to the broader mathematical world as a consummate practitioner of a peculiar, out-of-the-way art. Today

there is no longer anything that out-of-the-way about it. Coxeter has contributed to, exemplified, we could almost say presided over an unanticipated and dra matic revival of geometry.

Formal Power Series and Algebraic Combinatorics, 1994 - Louis J. Billera
Because of the inteplay among many fields of mathematics and science, algebraic combinatorics is an area in which a wide variety of ideas and methods come together. The papers in this volume reflect the most interesting aspects of this rich interaction and will be of interest to researchers in discrete mathematics and combinatorial systems.
Canadian Journal of Mathematics - 1954

An Introduction to Finite Tight Frames - Shayne F. D. Waldron 2018-02-03
This textbook is an introduction to the theory and applications of finite tight frames, an area that has developed rapidly in the last decade. Stimulating much of this growth are the applications of finite frames to diverse fields such as signal processing, quantum information theory, multivariate orthogonal polynomials, and remote sensing. Featuring exercises and MATLAB examples in each chapter, the book is well suited as a textbook for a graduate course or seminar involving finite frames. The self-contained, user-friendly presentation also makes the work useful as a self-study resource or reference for graduate students, instructors, researchers, and practitioners in pure and applied mathematics, engineering, mathematical physics, and signal processing.

Discrete Geometry and Symmetry - Marston D. E. Conder 2018-06-11
This book consists of contributions from experts, presenting a fruitful interplay between different approaches to discrete geometry. Most of the chapters were collected at the conference "Geometry and Symmetry" in Veszprém, Hungary from 29 June to 3 July 2015. The conference was dedicated to Károly Bezdek and Egon Schulte on the occasion of their 60th birthdays, acknowledging their highly regarded contributions in these fields. While the classical problems of discrete geometry have a strong connection to geometric analysis, coding theory, symmetry

groups, and number theory, their connection to combinatorics and optimization has become of particular importance. The last decades have seen a revival of interest in discrete geometric structures and their symmetry. The rapid development of abstract polytope theory has resulted in a rich theory featuring an attractive interplay of methods and tools from discrete geometry, group theory and geometry, combinatorial group theory, and hyperbolic geometry and topology. This book contains papers on new developments in these areas, including convex and abstract polytopes and their recent generalizations, tiling and packing, zonotopes, isoperimetric inequalities, and on the geometric and combinatorial aspects of linear optimization. The book is a valuable resource for researchers, both junior and senior, in the field of discrete geometry, combinatorics, or discrete optimization. Graduate students find state-of-the-art surveys and an open problem collection.

Regular Polytopes - H. S. M. Coxeter 2012-05-23
Foremost book available on polytopes, incorporating ancient Greek and most modern work. Discusses polygons, polyhedrons, and multi-dimensional polytopes. Definitions of symbols. Includes 8 tables plus many diagrams and examples. 1963 edition.

Shaping Space - Marjorie Senechal 2013-03-22
This second edition is based off of the very popular Shaping Space: A Polyhedral Approach, first published twenty years ago. The book is expanded and updated to include new developments, including the revolutions in visualization and model-making that the computer has wrought. Shaping Space is an exuberant, richly-illustrated, interdisciplinary guide to three-dimensional forms, focusing on the suprisingly diverse world of polyhedra. Geometry comes alive in Shaping Space, as a remarkable range of geometric ideas is explored and its centrality in our cultre is persuasively demonstrated. The book is addressed to designers, artists, architects, engineers, chemists, computer scientists, mathematicians, bioscientists, crystallographers, earth scientists, and teachers at all levels—in short, to all scholars and educators interested in, and working with, two- and three-dimensinal structures and patterns.

Lectures on Polytopes - Gunter M. Ziegler 1995
Based on a graduate course at the Technische Universität, Berlin, this book presents a wealth of material on the modern theory of convex polytopes. With linear algebra as a prerequisite, the text moves quickly from the basics to topics of recent research.

Geometry and Topology - Martin A. Mccrory 2020-12-18
This book discusses topics ranging from traditional areas of topology, such as knot theory and the topology of manifolds, to areas such as differential and algebraic geometry. It also discusses other topics such as three-manifolds, group actions, and algebraic varieties.

Convexity and Graph Theory - M. Rosenfeld 1984-01-01
Among the participants discussing recent trends in their respective fields and in areas of common interest in these proceedings are such world-famous geometers as H.S.M. Coxeter, L. Danzer, D.G. Larman and J.M. Wills, and equally famous graph-theorists B. Bollobás, P. Erdös and F. Harary. In addition to new results in both geometry and graph theory, this work includes articles involving both of these two fields, for instance ``Convexity, Graph Theory and Non-Negative Matrices'', ``Weakly Saturated Graphs are Rigid'', and many more. The volume covers a broad spectrum of topics in graph theory, geometry, convexity, and combinatorics. The book closes with a number of abstracts and a collection of open problems raised during the conference.

Handbook of Discrete and Computational Geometry - Csaba D. Toth 2017-11-22
The Handbook of Discrete and Computational Geometry is intended as a reference book fully accessible to nonspecialists as well as specialists, covering all major aspects of both fields. The book offers the most important results and methods in discrete and computational geometry to those who use them in their work, both in the academic world—as researchers in mathematics and computer science—and in the professional world—as practitioners in fields as diverse as operations research, molecular biology, and robotics. Discrete geometry has contributed significantly to the growth of discrete mathematics in recent years. This has been fueled partly by the advent of powerful computers

and by the recent explosion of activity in the relatively young field of computational geometry. This synthesis between discrete and computational geometry lies at the heart of this Handbook. A growing list of application fields includes combinatorial optimization, computer-aided design, computer graphics, crystallography, data analysis, error-correcting codes, geographic information systems, motion planning, operations research, pattern recognition, robotics, solid modeling, and tomography.

Abstract Regular Polytopes - Peter McMullen 2002-12-12
Table of contents
Handbook of Combinatorics - Ronald L. Graham 2003-02
Covers combinatorics in graph theory, theoretical computer science, optimization, and convexity theory, plus applications in operations research, electrical engineering, statistical mechanics, chemistry, molecular biology, pure mathematics, and computer science.
Regular Complex Polytopes - Coxeter 1975-03-06
The properties of regular solids exercise a fascination which often appeals strongly to the mathematically inclined, whether they are professionals, students or amateurs. In this classic book Professor Coxeter explores these properties in easy stages, introducing the reader to complex polyhedra (a beautiful generalization of regular solids derived from complex numbers) and unexpected relationships with concepts from various branches of mathematics: magic squares, frieze patterns, kaleidoscopes, Cayley diagrams, Clifford surfaces, crystallographic and non-crystallographic groups, kinematics, spherical trigonometry, and algebraic geometry. In the latter half of the book, these preliminary ideas are put together to describe a natural generalization of the Five Platonic Solids. This updated second edition contains a new chapter on Almost Regular Polytopes, with beautiful 'abstract art' drawings. New exercises and discussions have been added throughout the book, including an introduction to Hopf fibration and real representations for two complex polyhedra.
Unitary Reflection Groups - Gustav I. Lehrer 2009-08-13
A unitary reflection is a linear transformation of a complex vector space

that fixes each point in a hyperplane. Intuitively, it resembles the transformation an image undergoes when it is viewed through a kaleidoscope, or an arrangement of mirrors. This book gives a complete classification of all finite groups which are generated by unitary reflections, using the method of line systems. Irreducible groups are studied in detail, and are identified with finite linear groups. The new invariant theoretic proof of Steinberg's fixed point theorem is treated fully. The same approach is used to develop the theory of eigenspaces of elements of reflection groups and their twisted analogues. This includes an extension of Springer's theory of regular elements to reflection cosets. An appendix outlines links to representation theory, topology and mathematical physics. Containing over 100 exercises, ranging in difficulty from elementary to research level, this book is ideal for honours and graduate students, or for researchers in algebra, topology and mathematical physics. Book jacket.
Gröbner Bases and Convex Polytopes - Bernd Sturmfels 1996
This book is about the interplay of computational commutative algebra and the theory of convex polytopes. It centers around a special class of ideals in a polynomial ring: the class of toric ideals. They are characterized as those prime ideals that are generated by monomial differences or as the defining ideals of toric varieties (not necessarily normal). The interdisciplinary nature of the study of Grobner bases is reflected by the specific applications appearing in this book. These applications lie in the domains of integer programming and computational statistics. The mathematical tools presented in the volume are drawn from commutative algebra, combinatorics, and polyhedral geometry.
Encyclopaedia of Mathematics - M. Hazewinkel 2013-12-01

The Classes of Higher Dimensional Polytopes in Chemical, Physical, and Biological Systems - Zhizhin, Gennadiy Vladimirovich 2022-04-08
The study of the geometry of structures that arise in a variety of specific natural systems, such as chemical, physical, biological, and geological, revealed the existence of a wide range of types of polytopes of the

highest dimension that were unknown in classical geometry. At the same time, new properties of polytopes were discovered as well as the geometric patterns to which they obey. There is a need to classify these types of polytopes of the highest dimension by listing their properties and formulating the laws to which they obey. The Classes of Higher Dimensional Polytopes in Chemical, Physical, and Biological Systems explains the meaning of higher dimensions and systematically generalizes the results of geometric research in various fields of knowledge. This book is useful both for the fundamental development of geometry and for the development of branches of science related to human activities. It builds upon previous books published by the author on this topic. Covering areas such as heredity, geometry, and dimensions, this reference work is ideal for researchers, scholars, academicians, practitioners, industry professionals, instructors, and students.

Polytopes - Tibor Bisztriczky 2012-12-06
The aim of this volume is to reinforce the interaction between the three main branches (abstract, convex and computational) of the theory of polytopes. The articles include contributions from many of the leading experts in the field, and their topics of concern are expositions of recent results and in-depth analyses of the development (past and future) of the subject. The subject matter of the book ranges from algorithms for assignment and transportation problems to the introduction of a geometric theory of polyhedra which need not be convex. With polytopes as the main topic of interest, there are articles on realizations, classifications, Eulerian posets, polyhedral subdivisions, generalized stress, the Brunn--Minkowski theory, asymptotic approximations and the computation of volumes and mixed volumes. For researchers in applied and computational convexity, convex geometry and discrete geometry at the graduate and postgraduate levels.

Handbook of Convex Geometry - Gerard Meurant 2014-06-28
Handbook of Convex Geometry, Volume A offers a survey of convex geometry and its many ramifications and relations with other areas of mathematics, including convexity, geometric inequalities, and convex sets. The selection first offers information on the history of convexity, characterizations of convex sets, and mixed volumes. Topics include elementary convexity, equality in the Aleksandrov-Fenchel inequality, mixed surface area measures, characteristic properties of convex sets in analysis and differential geometry, and extensions of the notion of a convex set. The text then reviews the standard isoperimetric theorem and stability of geometric inequalities. The manuscript takes a look at selected affine isoperimetric inequalities, extremum problems for convex discs and polyhedra, and rigidity. Discussions focus on include infinitesimal and static rigidity related to surfaces, isoperimetric problem for convex polyhedral, bounds for the volume of a convex polyhedron, curvature image inequality, Busemann intersection inequality and its relatives, and Petty projection inequality. The book then tackles geometric algorithms, convexity and discrete optimization, mathematical programming and convex geometry, and the combinatorial aspects of convex polytopes. The selection is a valuable source of data for mathematicians and researchers interested in convex geometry.

Complex Symmetries - György Darvas 2022-01-01
This volume is a collection of essays on complex symmetries. It is curated, emphasizing the analysis of the symmetries, not the various phenomena that display those symmetries themselves. With this, the volume provides insight to nonspecialist readers into how individual simple symmetries constitute complex symmetry. The authors and the topics cover many different disciplines in various sciences and arts. Simple symmetries, such as reflection, rotation, translation, similitude, and a few other simple manifestations of the phenomenon, are all around, and we are aware of them in our everyday lives. However, there are myriads of complex symmetries (composed of a bulk of simple symmetries) as well. For example, the well-known helix represents the combination of translational and rotational symmetry. Nature produces a great variety of such complex symmetries. So do the arts. The contributions in this volume analyse selected examples (not limited to geometric symmetries). These include physical symmetries, functional (meaning not morphological) symmetries, such as symmetries in the

construction of the genetic code, symmetries in human perception (e.g., in geometry education as well as in constructing physical theories), symmetries in fractal structures and structural morphology, including quasicrystal and fullerene structures in stable bindings and their applications in crystallography and architectural design, as well as color symmetries in the arts. The volume is rounded of with beautiful illustrations and presents a fascinating panorama of this interdisciplinary topic.

Geometric Regular Polytopes - Peter McMullen 2020-02-20
Regular polytopes and their symmetry have a long history stretching back two and a half millennia, to the classical regular polygons and polyhedra. Much of modern research focuses on abstract regular polytopes, but significant recent developments have been made on the geometric side, including the exploration of new topics such as realizations and rigidity, which offer a different way of understanding the geometric and combinatorial symmetry of polytopes. This is the first comprehensive account of the modern geometric theory, and includes a wide range of applications, along with new techniques. While the author explores the subject in depth, his elementary approach to traditional areas such as finite reflexion groups makes this book suitable for beginning graduate students as well as more experienced researchers.

The Coxeter Legacy - Harold Scott Macdonald Coxeter
This collection of essays on the legacy of mathematican Donald Coxeter is a mixture of surveys, updates, history, storytelling and personal memories covering both applied and abstract maths. Subjects include: polytopes, Coxeter groups, equivelar polyhedra, Ceva's theorum, and Coxeter and the artists.

Finite Geometries - Catherine Anne Baker 2020-10-14
This book is a compilation of the papers presented at the conference in Winnipeg on the subject of finite geometry in 1984. It covers different fields in finite geometry: classical finite geometry, the geometry of finite planes, geometric structures and the theory of translation planes.

The Geometry of Higher-Dimensional Polytopes - Zhizhin, Gennadiy Vladimirovich 2018-08-03

The majority of the chemical elements form chemical compounds with molecules of higher dimension (i.e., substantially exceeding three). This fact is very important for the analysis of molecular interactions in various areas: nanomedicine, nanotoxicology, and quantum biology. The Geometry of Higher-Dimensional Polytopes contains innovative research on the methods and applications of the structures of binary compounds. It explores the study of geometry polytopes from a higher-dimensional perspective, taking into account the features of polytopes that are models of chemical compounds. While highlighting topics including chemical compounds, symmetry transformation, and DNA structures, this book is ideally designed for researchers, academicians, and students seeking current research on dimensions present in binary compounds.

Regular Complex Polytopes - Coxeter 1975-03-06

Multi-shell Polyhedral Clusters - Mircea Vasile Diudea 2017-10-20
This volume presents new methodologies and rationalizes existing methods that are used in the design of multi-shell polyhedral clusters. The author describes how the methods used are extended from 2D-operations on maps to 3D (and higher dimensional) Euclidean space. A variety of structures is designed and described in detail and classified giving rise to an atlas of multi-shell nanostructures. The book therefore sheds a new light on the field of crystal and quasicrystal structures, an important part of nanoscience and nanotechnology. The author goes on to show how the recently established methods are used for building complex multi-shell nanostructures and how this completes the existing information in the field. The atlas of such structures is completed with atomic coordinates (included as supplementary material). The content of this book gives a useful insight into structure elucidation and suggests new material synthesis.

Kaleidoscopes - F. Arthur Sherk 1995-05-31
H.S.M. Coxeter is one of the world's best-known mathematicians who wrote several papers and books on geometry, algebra and topology, and finite mathematics. This book is being published in conjunction with the 50th anniversary of the Canadian Mathematical Society and it is a

collection of 26 papers written by Dr. Coxeter.